Free Communication Session 01 | B332 | 28.08.2013 | 09:00–11:00

Theme: Dental Treatment and Restorative Dentistry: Caries

FC001
A Comparison of Different Radiographic Modalities for Detection of Occlusal Caries Lesions in vitro
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Objectives: The aim of this in-vitro study was to compare the diagnostic accuracy of different radiographic imaging modalities in detecting occlusal caries lesions.

Materials and methods: Under standardised conditions, 125 extracted human permanent molar teeth with sound or occlusal caries lesions were radiographed using a conventional film system (F-speed), storage phosphor plate system (PSP), charge-coupled device (CCD) and cone beam computer tomography system (CBCT). Two observers scored the resulted images for the presence or absence of caries. Then, the teeth were histologically prepared and definite diagnosis was determined by stereomicroscopic assessment. The area under the receiver operating characteristic curve (Az), sensitivity, specificity, and accuracy of each imaging modality were calculated, as well as the intraexaminer and interexaminer reproducibility.

Results: For both thresholds interexaminer and intraexaminer agreement was higher for CBCT. Similar Az values were achieved with all imaging methods at diagnostic D1 threshold (enamel lesions). Az values of CBCT system were found statistically higher than other imaging modalities at diagnostic D3 threshold (p > 0.05) and no significant difference was found between other imaging modalities. All radiographic methods showed similar sensitivities, specificities and accuracy in detecting enamel lesions. CBCT system showed higher sensitivities and accuracy in detecting dentine lesions.

Conclusions: Within the limitations of this study, CBCT showed better performance in detecting more advanced occlusal caries lesions in all radiographic systems.

FC002
An in vitro SEM Comparative Study of Dentine-Biodentine™ Interface
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Aims: Investigate the adhesion interfaces between Biodentine™, MTA, GIC and Dentine. The sealing ability of these materials is assessed in vitro through SEM observation of the tooth-cement interface.

Materials and methods: Sixty three freshly extracted human molars were used and randomly divided into three groups according to filling material used for the restoration of the occlusal cavities. Groups (A) restored with Biodentine™, (B) with MTA and (C) GIC. Each group subdivided into three groups according time of storage (7, 14, 28) days. After storage period, the teeth were sectioned mesio-distally using a low speed diamond saw through the center of the restoration. The samples were prepared for (SEM: TESCAN – Germany) to find gap between restorations and dentine.

Results: SEM images for the interface gap clearly appear in significant different (32 µm) with Biodentine™, MTA and GIC, at (7) days, adaptation of these materials and dentine increased (3.35 µm) at (14) days. In (28) days the results are completely different such as for GIC no adaptation (85 µm), while the MTA (7 µm), and in Biodentine™ the results was the best i.e. approximately intimate contact (1 µm), see figure (1). All the difference was statistically done for significant comparative to all storage times.

Conclusions: All studies material exhibited some degree of marginal gaps. A positive correlation was found between the marginal adaptation and time of storage. Biodentine™ exhibited similar performances that are better than GIC and MTA under the conditions of our study.

FC003
Clinical Performance of Methods in Detecting Occlusal Caries Lesions in-vitro
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Conclusions: All studies material exhibited some degree of marginal gaps. A positive correlation was found between the marginal adaptation and time of storage. Biodentine™ exhibited similar performances that are better than GIC and MTA under the conditions of our study.
based devices. After measuring the reference point of each tooth, the teeth were histologically prepared and classified according to lesion extension as the gold standard. Intra and inter-examiner reliability of the examinations was assessed using Cohen’s Kappa statistics. Sensitivity, specificity, and accuracy of the diagnostic methods were calculated. The area under the receiver operating characteristic curve (Az) was measured to compare their diagnostic performance of methods for occlusal caries diagnosis at D1 (enamel) and D3 (dentine) thresholds.

**Results:** Using the D1 and D3 threshold, all methods presented similar Az values (p > 0.05). ICDAS showed lower specificity comparing to other methods, which means ICDAS showed more false positive scores. MID showed higher interexaminer agreement at both D1 and D3 threshold. For both enamel and dentin thresholds all test methods showed similar intraexaminer agreement for both observers.

**Conclusions:** All test methods seemed to be useful auxiliary tools with good performance in detecting occlusal caries lesions.

**FC004**

**Internal Consistency and Diagnostic Success of New Caries Detection Device**

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**Objective:** This in-vitro study on occlusal surface aimed to assess internal consistency and diagnostic success of the new LED-based caries detection device and to compare it with DIAGNOdent Pen (LF-based) which is the most widely-accepted caries detection device in the literature.

**Material and methods:** Sixteen occlusal non-cavitated molar surfaces were investigated twice by 20 undergraduate students with the LF- and LED-based caries detection devices. The teeth were sectioned at the surfaces suspected of containing occlusal caries and histologically evaluated using stereomicroscopy as a gold standard. Inter-observer agreement was calculated using Fleiss’ Kappa statistic. The sensitivity, specificity, and accuracy in diagnosing occlusal caries using the two devices were also evaluated.

**Result:** Fleiss’ Kappa showed moderate agreement for both LF- and LED-based caries detection devices (0.52 and 0.54). The mean specificity of the LED-based device was found as 0.75 and its sensitivity was found as 0.69. The mean specificity of the LF-based device was 0.35 and its sensitivity was 0.93.

**Conclusion:** Within the limitation of the current study, this study revealed that there were no differences among students for the measurements of two caries detection devices. Thus, LED-based device may be useful additionally visual inspection and dental radiographs as well as LF-based device. Furthermore, although internal consistency of the measurements of the two devices is acceptable according to results of the present study, diagnostic success of the LF-based device was found lower than the LED-based device for occlusal caries diagnosis.

**FC005**

**The Technique of Composite Filling with Impression**

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**Aim:** The technique of composite filling with impression is to give us valuable advantages in tooth filling processes. I have used this treatment technique successfully at my clinic for 5 years. Mostly indications are occlusal cavities, enamel yet not collapsed.

**Methods:** Main material is orthodontic silicone wax. Before preparing the cavity, the impression of tooth will be achieved by pressing a piece of wax to the tooth surface. The wax is semi-transparent material and it will permit the curing light to be absorbed by the composite. Also the pressure will be occured during the polymerization of the composite will be useful to discard the C force.

After the cavity is prepared, acid will be applied over enamel boundary. This issue will help to remove overflow composite easier. As a filling material a flow and soft composite will be satisfactory. But in deep cavities or when hard composites are needed, the desired material will be applied but 1 mm of occlusal gap must be reserved. Flow composite could be used in this gap for finishing. After removing wax, the composite must be continued to be lightened to impact the hardening process. Overflow material could be easily removed. Over occlusal contacts will not occur.

**Results:** Finally, the technique of composite filling with impression gives the dentist and the patient fast, reliable and aesthetic results, because of the impression is achieved from the original tooth.

**FC006**

**Visualisation of Human Dental Pulp Vasculature by Detection of CD34**

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**Aim:** This study was undertaken to show the vasculogenesis, process by which endothelial precursor cells form new blood vessels in the embryo. Endothelial stem cells might persist into adult life, contributing to the formation of new blood vessels. To characterize vascularization of human dental pulp, we examined the expression of the human hematopoietic progenitor cell antigen CD34.

**Methods:** In this study we have examined 30 human teeth under three different clinical conditions: healthy teeth, shallow and deep cavities. Teeth were extracted and immediately cut longitudinally; pulp tissue was extirpated and fixed in formalin for 24 h at 4°C. The specimens were embedded in paraffin, according to standard-ized laboratory procedure. Sections were cut at 5 µm thicknesses.
A Novel Computer Controlled Tri-Dimensional Cutting and Cavity Preparation Machine (CCTCCM) for Dental Laboratory Research

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Introduction: The aim of this study was to design, manufacture a simple Computer Controlled Three-dimensional Cutting flat surfaces and Cavity Preparation Machine (CCTCCM) and to compare the accuracy of cavities prepared by a CCTCCM to those prepared by an Expert Practitioner (EP).

Materials and methods: The hardware consists of several parts to provide high-speed headpiece the ability to move in three axes. The motion control system is programmed to create repeatable movements.

There were two groups of 12 samples. Cylindrical 2 x 2 mm cavity preparations (CP) on flat dentinal surface were prepared using CCTCCM (Group A) and by an EP (Group B). Measurements were done with ImageJ software to evaluate cavity diameter and depth accuracy.

Results: Welch two sample t-test in R-software was done for circularity, circle accuracy, depth uniformity error and depth accuracy in cavity preparation between CCTCCM and ECP groups. p-values smaller than 0.05 showed highly significant differences. An improvement of 3.6, 9.1, 4.7 and 6.3 times were accrued respectively if a machine is used for cavity preparation.

Discussion: Standardized cavity preparation, repeatability, remount ability of the jig and the tooth sample at the exact previous place and non-traumatic CP make CCTCCM a reliable device for in-vitro research to standardize CP.

Conclusion: The precision of CP in term of diameter and depth with CCTCCM was 8.4 and 5.0 times more than ECP respectively.

Theme: Preventive Dentistry: Caries

FC008
CPP-ACPF Application Methods – Effects on Salivary Parameters and Fluoride Level
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Purpose: Casein phosphate products have in recent years been shown to have caries preventive effects. However, there has been no specific manufacturer’s instruction, or agreement, on how these should be “applied.” The aim of this study was to compare the effect of two methods of application, namely using cotton buds and special tray, for topical application of a casein phosphopeptide-amorphous calcium phosphate preparation (CPP-ACP, a product containing 900 ppm fluoride) on whole saliva.

Method: Ten healthy 18–20 year-old volunteers were strictly trained to use CPP-ACP (Tooth Mousse Plus®) using cotton buds and special trays in a standardized manner. Non-fluoride toothpaste was used for tooth brushing 2 weeks prior to and during the test duration. CPP-ACP applications were twice daily for 7 days for each method, with a 1-week washout period in between. Stimulated whole saliva of subjects were evaluated for consistency, flow-rate, pH and buffering capacity at baseline and at the end of the study period. In addition, fluoride retention and concentration were measured and compared.

Results: There were no differences in salivary parameters (consistency, flow-rate, pH, buffering capacity) following applications of CPP-ACP using the two methods of applications. However, there was a statistically significant difference in salivary fluoride concentrations (p < 0.05) between pre- and post-treatment in the special tray group. Higher salivary fluoride concentration, with longer retention, was also achieved with special tray application.

Conclusion: Following short-term CPP-ACP applications, the use of special trays resulted in higher salivary fluoride level compared to its applications using cotton buds.

Theme: Preventive Dentistry: Epidemiology

FC009
Identification and Antibiotic Susceptibility of Oral Streptococci from Dental Plaque in Children
Aida Namani Rexhepi1, Raimonda Niko2, Vjosa Hamiti Krasniqi1, Agim Begzati1, Teuta Kurllolvi1, Blerta Latifi Xhemajli1, Zana Bajrami Agani3, Merime Prekazi Loxha3
Introduction: Oral streptococci are major inhabitants of dental plaque, particularly viridians group of streptococci, which can cause serious infections. However, their presence may be associated with infective endocarditis, especially in children with congenital heart disease.

Aim: The aim of this study is to identify the presence of different types of oral streptococci from dental plaque, using Vitek 2 methods (bioMerieux) in children and at the same time their susceptibilities in some antibiotics using disc diffusion techniques.

Material and methods: Samples of supragingival dental plaques for microbiological studies were collected from 60 healthy children, ages 5–15 years from Kosovo. The samples were obtained from the bucal surfaces of the first (deciduous or permanent) molars of the lower jaw and incisors of the upper jaw using the sterile swab sticks. Gram positive cocci were identify by VITEK 2-GP card. The Samples were cultivated on Columbia nutrient agar and thioglycollat (Institute of Microbiology CCK). After the identification of gram-positive cocci, the disc diffusion method is used for their susceptibilities in antibiotics: amoxicillin, cefalexin eritromicin and clindamycin.

Results: In microbiological tests have dominated viridians group of streptococci (S. mitis, S. oralis, S. salivarius, S. vestibularis, S. sanguis, S. mutans). From overall oral cocci group, our results shows that amoxicillin sensitive were 89%, cefalexin 63.3%, eritromicin 66.6% and clindamycin 70%.

Conclusion: It is important to be known the presence of oral streptococci and their sensitivity in antibiotic because of the serious infections they can cause during the dental treatment, especially in children with special medical needs.

Theme: Preventive Dentistry: Epidemiology

FC010
Dental Caries Experience and Periodontal Status Among Schoolchildren in Georgia
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Aim: To evaluate current caries experience and periodontal status of schoolchildren in Georgia.

Materials and methods: A pathfinder study was planned and executed according to the WHO recommendations. School children were examined in three large cities populated mainly by ethnic Georgians and in two villages represented by ethnic minorities (Armenian and Azeri). In order to assess caries experience DMFT as well as dmft values were recorded by calibrated examiners in three different age groups: first grade, seventh grade and tenth grade (the age of 5–6, 12 and 15 years respectively). For the tenth grade group, periodontal status was also evaluated by recording outcomes of plaque, calculus and bleeding on probing.

Results: Overall 1053 children were examined. The total caries experience values for the first (n = 404), seventh (n = 334) and tenth grade (n = 314) children were DMF = 0.04 and dmf = 4.40, DMF = 1.81 and DMF = 3.19 respectively. The plaque was evidenced in 230 (73.25%) children; in 125 (39.81%) children plaque was evidenced on all the examined teeth. Calculus was evidenced in 117 (37.26%) children. Probing pocket depth of 5 mm and above was detected in 85 participants (27.07%). Seventeen (5.41%) children presented with more than three sites with PD > 5 mm. Bleeding on probing was recorded in 83 (26.43%) children.

Conclusions: Caries experience as well as periodontal diseases seem to be prevalent in Georgia. Further research is warranted in order to shed light on the influencing factors. Education and prevention programs should be introduced in order to improve oral health status among the children in Georgia.

Free Communication Session 02 | B342 | 28.08.2013 | 09:00–11:00

Theme: Dental Treatment and Restorative Dentistry: Endodontics

FC011
A Survey on Endodontic Practice of Dental Practitioners in Turkey
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Aim: To assess the current endodontic practice in Turkey and to find out the opinions of practitioners on their level of practice and training needs.

Methods: A questionnaire dealing with current endodontic practice was conducted. A total of 650 practitioners from Turkey were randomly chosen and the questionnaires were sent to their e-mail addresses. All responses were gathered and thereafter analyzed using the statistical software SPSS.

Results: A total of 204 dentists returned the questionnaires, giving a response rate of 31.3%. More than 70% of the respondents stated that they never used rubber-dam during endodontic treatment, 60.3% indicated that they routinely took preoperative radiographs. The most commonly chosen technique for working length estimation was taking radiographs (78%). Seventy-six percent of the respondents used rotary NiTi instruments. Nearly 64% of them used rotary NiTi instruments more than five times per week and 30.5% used them until distortion occurred. Respondents commonly applied a combination of techniques (57.2%) or crown down (28.3%). Nearly 50% of the respondents used rotary NiTi instruments for retreatment and almost 90% considered postgraduate endodontic training was necessary.

Conclusions: This study demonstrates that the majority of respondents adopted the rotary NiTi instruments and techniques into
endodontic practice. On the other hand, some other procedures such as rubber-dam usage for isolation or electronic apex locator application in working length determination are not well incorporated. The need of endodontic training after graduation is seemed to be a common opinion among practitioners.

FC012
An in vitro Comparison of Antibacterial Effects of Four Different Root Canal Irrigation Method in Root Canals Infected with Enterococcus faecalis
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Aim: The purpose of the study was to compare the antibacterial effect of four different currently generated root canal irrigation methods in root canals infected with E. faecalis.

Methods: In the study, 105 extracted single rooted teeth were used. Twenty samples were distributed to each four experimental and a positive control group. Five teeth were used in SEM imaging. Groups were generated respectively in this way: Group 1: Hawe irrigation probe side-vented needle, Group 2: EndoActivator, Group 3: EndoVac, Group 4: SAF ve Grup 5: (+) control group.

After shaping with hand instruments root canals were infected with E. faecalis and first samples (S1) was taken, then the mechanic preparation was done with rotary instruments and irrigation systems. Then second samples (S2) were taken. Intra and inter group analyses were performed.

Statistical analyses was performed by SPSS (Statistical package for social sciences) for windows 15.0 program. While study data were being evaluated the convenience of the parameters to normal distribution was evaluated with Kolmogorov–Smirnov test and parameters weren’t in compliance with normal distribution. The significance was evaluated at the level of p < 0.05.

Results: The decrease percentage of the number of bacteria in positive control group was significantly lower than experimental groups (p < 0.005). There was no significant difference between the experimental groups in terms of decrease percentage after irrigation (p > 0.05).

Conclusions: According to the result of the study there was no statistically difference observed between irrigation systems used in terms of antibacterial effect.

FC013
Assessment of New Root Canal Filling Material Based on Polymer-Modified White Portland Cement with CaCl2:PH and Solubility Study
Saud Jasm Dizayee, Raid Fahim Salman
Khazad Training Center for Dental and Oral Health, Erbil, Iraq

Aim: This study aimed to assess a new root canal filling material which may known as Polymer-modified White Portland cement and investigate its properties in comparison with Portland cement with CaCl2.

Materials and methods: The experimental materials were prepared from 20% bismuth oxide and 80% white Portland cement. Later on CaCl2 was added to them. Polymer was added to the developing material to enhance the workability of this material to be used as injectable root canal filling, so the mixture of 17.5% polymer, 12.5% CaCl2 and 20% water was the most favorable one that comply the requirements.

pH study was conducted to measure the pH value of the experimental material and Portland cement with CaCl2, ten specimens were used for each material.

The percentage of solubility of the experimental material and Portland cement with CaCl2 was determined by modified method of American Dental Association specification no. 30 (ANSI/ADA 1991). Ten specimens were used for each tested material.

Results: It was shown that the experimental material had a higher pH which was (8.22 ± 1.3) than that of the Portland cement with CaCl2 which was (8.0 ± 1.1).

There was non significant difference between experimental and Portland cement with CaCl2. Regarding the solubility of the experimental material the value was less than the control.

Conclusions: It was concluded that this new material (Polymer-modified White Portland Cement) had comparable or better property with Portland cement with CaCl2.

FC014
Bond Strength of Resin Sealer to Root Canal Dentin
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Aim: The aim of this study was to evaluate the effect of photodynamic therapy (PDT) on the bond strength of resin sealer to root canal using a push-out test method.

Methods: Sixty single rooted teeth which have round shaped canals were used in this study. The teeth were divided into four groups according to the irrigation protocol during root canal treatment (n = 15). Group 1: irrigated with saline (control), Group 2: irrigated with sodium hypochlorite (NaOCl-5.25%), Group 3: irrigated with sodium hypochlorite and EDTA (17%), Group 4: irradiated with a photodynamic system (HELBO Photodynamic Systems). The roots were filled with single cone gutta-percha and a resin sealer (Adseal; Meta Biomed Co). All the specimens were then cut perpendicular to their long axis, to obtain 1 mm thick slices from the middle portions. Using push-out test, bond strength between resin sealer and root canal dentin was measured after 24 h using universal testing machine. Statistical analysis was performed with analysis of variance followed by Tukey HSD tests.

Results: The analysis of variance indicated that push-out test values do not statistically vary according to the irrigating solution used (p > 0.05). There was no effect of PDT on bond strength of resin sealer to root canal dentin.

Conclusion: The irrigation protocols used during root canal treatment did not affect the push-out bond strength between resin sealer and root canal dentin.
FC015

Clinical Implications of Calcifying Nanoparticles in Dental Diseases: A Critical Review
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Department of Restorative, Riyadh Colleges of Dentistry and Pharmacy, Riyadh, Saudi Arabia

Background: Unknown cell culture contaminants were described by Kajander and Ciftcioglu in 1998. These contaminants were called Nanobacteria (NB) initially and later on calcifying nanoparticles (CNPs). Their exact nature is unclear and controversial. Calcifying nanoparticles have unique and unusual characteristics, which preclude placing them into any established evolutionary branch of life.

Aim: The aim of this systematic review was to assess the published data concerning CNPs since 1998.

Materials and methods: MEDLINE (PubMed) and SPIE digital library electronic searches were conducted. Nanobacteria, and calcifying nanoparticles were used as key wards.

Results: The search yielded 135 full-length papers. Further screening of the titles and abstracts that followed the review criteria resulted in 40 papers.

Conclusions: The review showed that whether or not nanobacteria are living particles that replicate or are inert, nanocalcification is still controversial. Some Investigators have clarified a role of CNPs in treatment of cracked and/or eroded teeth.

FC016

Comparative Evaluation of Cleaning Efficacy of Root Canal Using Two Rotary Ni-Ti File System vs. Hand K-File- A SEM Study
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Department of Conservative Dentistry & Endodontics, K.G’s Medical University, Lucknow, India

Aim: A study was conducted to compare the efficacy of three different file system (ProTaper, RaCe and K-flex files) in smear layer removal at coronal, middle and apical third of root canal.

Methods: Thirty healthy mandibular single rooted premolars were selected and divided into three groups (n = 10). Each group was instrumented by ProTaper, RaCe and K-flex files respectively and then grooved and split into two halves. Each sample was analyzed by scanning electron microscope at coronal, middle and apical third. Smear score of all the three groups were compared. The statistical analysis was done using wilcoxon score and found coronal and middle third of root canal were cleaner than apical third in all the three groups.

Results: RaCe group smear scores were minimum and for K-flex files it were maximum, but the result were not statistically significant (p < 0.05). The results of the present study indicated that neither of the three file system achieved complete cleanliness of root canal, particularly in the apical part.

FC017

Different Treatment of an External/Internal Root Resorptions Associated with Periodontal-Endodontic lesion:
A 30 Month Follow-Up
Yasemin Şentürk Yaman, Kamran Gulsahi
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Background: To describe the treatment of lower molar tooth associated with external/internal resorption and periodontal-endodontic lesion.

Technique: Sixty-one-year-old male patient was referred to the endodontic therapy of left mandibular second molar tooth. Radiographic examination demonstrated external-internal resorption in mesial root; also bone loss in furcation area and mesial root. Clinical examination showed the vital tooth with a deep periodontal pocket in mesial root. The access cavity was opened. While the working length was calculated, a perforation was determined between the internal and external resorption. Distal root canal was obturated with AH Plus and gutta-percha. Mesial root canals were prepared up to region of perforation and irrigated with 1% NaOCl, then a Ca(OH)2 paste was applied to canals. One week later, Ca(OH)2 was removed with copious 1% NaOCl irrigation, and thereafter, the root canals were irrigated with sterile saline and were filled by iRootSP sealer without gutta-percha cone up to the level of perforation in mid-root. The access cavity was restored with glass ionomer cement. At 15- and 30-month follow-up examination, no clinical or radiographic symptoms were identified. Unfilled apical portion was asymptomatic and perforation was healed.

Conclusion: CBCT is useful for detected of perforation in the external/internal root resorption cases. The studies demonstrated that when iRoot SP was exposed to moist environment, hydroxyapatite formed and being a true self-adhesive, this sealer has to possess high fracture resistance, tensile strength, and biocompatibility. Due to the features of iRoot SP can be considered as a favorable material for treatment of such cases.

FC018

Effect of Endodontic Irrigants When Used Alone or in Combinations on Mineral Content of Human Dentin
Mehmet Burak Güneşer, Ayça Unverdi Eldeniz
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Aim: The aim of this study was to evaluate the ultramorphological and chemical effects of different endodontic irrigation solutions alone and their combinations on dentin.

Materials and methods: Standardized dentin discs were prepared from extracted non-carious human third molar teeth. The discs were randomly divided to 12 groups (n = 4) according to dentin treatment procedure: GroupI- 2.5% sodium hypochlorite (NaOCl), GroupII- 2% chlorhexidine (CHX), GroupIII- 2.5%NaOCl + Saline + CHX, GroupIV- 2.5%NaOCl + 17%EDTA + 2.5%NaOCl, GroupV- 17%EDTA + 2.5%NaOCl + 17%EDTA, GroupVI-Phosphate buffered saline solution (PBS), GroupVII- 17% EDTA + CHX + 17%EDTA, GroupVIII- QMix, GroupIX-
Octenidine hydrochloride (OCT), GroupX- OCT + EDTA + OCT, GroupXI- Saline and Group XII- no treated dentin as a control group. After exposure of dentin discs to 5 ml of test irrigation solutions for 15 min, the specimens were subjected to scanning electron microscopic (SEM) and energy dispersive X-ray (EDX) spectrometric analysis to determine calcium, phosphorus, carbon, sodium, magnesium, silicon and oxygen content in% weight of each specimen surface.

Results: The EDX results showed that calcium content was significantly decreased only in GroupV, VII and IX. Phosphorus content was significantly decreased only in GroupV. Significantly higher carbon content was detected in all test groups except in Group I, VIII and XI. Group I was the only group that had the least effect on sodium content. No differences were observed in magnesium and silicon content of any of the groups while oxygen content was significantly decreased in GroupV.

Conclusions: QMix and saline solutions caused the minimal effect on mineral content of dentin whereas 17% EDTA + 2.5% NaOCl + 17% EDTA combination had the worst effect on dentin.

FC019
Interfacial Adaptation and Thickness of Bioceramic-Based Root Canal Sealers
Zeti Adura Che Ab Aziz, Noor Hayaty Abu Kassim, Afaf Yahya Al Haddad
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Introduction: Aim of this study is to evaluate the sealing ability of bioceramic-based sealer compared to AH plus sealer in term of interfacial adaptation to the root dentin and sealer thickness.

Methods: Sixty extracted single root premolars were standardized and instrumented. Teeth were divided into four groups (15 roots each) according to type of sealer as following: Group 1: Apatite Sankin type III, Group 2: MTA-Fillapex, Group 3: Endosequence BC, and Group 4: AH plus. Sealers were labeled with 0.1% Rhodamine B fluorescent dye. The roots were sectioned transversally at the level of 1 mm (apical), 3 mm (middle), and 6 mm (coronal) from the terminus of filling. Each cross section was evaluated under confocal laser scan microscope and the percentage of gap containing region to the circumferential of whole root canal was calculated. Specimens also examined under stereomicroscopic (SEM) and energy dispersive X-ray (EDX) spectrometric analysis to determine calcium, phosphorus, carbon, sodium, magnesium, silicon and oxygen content in% weight of each specimen surface.

Results: The EDX results showed that calcium content was significantly decreased only in GroupV, VII and IX. Phosphorus content was significantly decreased only in GroupV. Significantly higher carbon content was detected in all test groups except in Group I, VIII and XI. Group I was the only group that had the least effect on sodium content. No differences were observed in magnesium and silicon content of any of the groups while oxygen content was significantly decreased in GroupV.

Conclusions: QMix and saline solutions caused the minimal effect on mineral content of dentin whereas 17% EDTA + 2.5% NaOCl + 17% EDTA combination had the worst effect on dentin.

FC020
Investigation of the Root and Canal Configuration of Maxillary Permanent First and Second Molars Using Cone-Beam Computed Tomography
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Objective: To investigate the root and canal morphology of maxillary first and second molars in a Turkish population by using cone beam computed tomography (CBCT).

Materials and methods: Maxillary first (n = 894) and second (n = 944) molar teeth from 605 Turkish patients were analyzed to make the following observations: (i) the number of roots and their morphology; (ii) the number of canals per root; (iii) the incidence of a second root canal in the mesiobuccal root (MB2), and the correlations between the incidence of an MB2 canal and age, gender, and tooth position and (iv) the frequency of C-shaped canals. The root canal configuration was categorized and compared according to Vertucci’s criteria.

Results: The most common root morphology was that of three separate roots in both first (93.6%) and second molars (69.1%). Type I canal configuration was the most frequent in all roots: 56.6–100%. The mesiobuccal root (MB) had significantly more variations in canal configuration when compared with other roots in both the first and second molars (p < 0.05). C-shaped canals were found as 0.52% in second molars. The incidence of an MB2 canal (39.3% for females and 43.3% for males both in first and second molars) showed a statistical difference in gender (p < 0.05).

Conclusion: The MB roots of maxillary molars tended to have more variations in the canal system than the distobuccal or palatal roots and the incidence of MB2 was higher in the first molars than in the second molars.

Free Communication Session 03 | B343 | 28.08.2013 | 09:00–11:00

Theme: Dental Treatment and Restorative Dentistry: Materials

FC021
A Clinical Photogrammetric Technique for Dental Analysis and Visualization
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Aim: Accurate information about teeth shape, position and their appearance in the face is essentially important for various dentistry fields such as orthodontia and prosthodontia. New techniques for teeth shape and teeth occlusion registration and analysis is proposed based on applying 3D teeth arc model instead of plaster mould.

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Direct intra-oral measurement seems very advantageous for dental applications and research. Firstly, direct intraoral measurement would overcome the tedious of the impression and casting procedure for patients as well as dental workers. Secondly the use of direct intra-oral measurements could improve the efficiency of measurements, degrees the time and cost of the measurement. The main purpose of this study is to evaluate the effectiveness of low-cost 3D modelling method. In the study, 3D models of different tooth were obtained with “narrow baseline photogrammetry” techniques. Moreover, these models were evaluated with the potential ability to form a base approach to digital archiving and gathering information about teeth shape, position and their appearance in the face.

**Materials and methods:** Method involves two basic phases. These are: (i) intra-oral image collection, and (ii) processing of the collected images. Factors, affecting the success of photogrammetric technique used in this study, could be listed as: camera resolution, camera calibration method, angles between photos, photo orientation quality, and targets.

**Results:** In the lights of the first applications, it could easily be said that, method was given promising results for the 3D digital archiving and acquisition of information about teeth.

**FC022**

**Comparative Study on Enamel Microstructure of Bovine and Human Incisors**

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**Objective:** To comparatively investigate enamel microstructure of bovine and human incisors.

**Materials and methods:** Sixteen human incisors (four each maxillary/mandibular central/lateral incisor) extracted for periodontal reasons and eight bovine mandibular incisors were longitudinally cut into three fragments (mesial/middle/distal thirds) at the labiolingual direction before they were horizontally cut into three small fragments (occlusal/middle/cervical thirds). Each fragment of bovine incisors was further trisected in longitudinal or labiolingual directions. Human and bovine fragments were further tangentially cut through the middle of whole enamel thickness. All the sectioned surfaces were observed by SEM.

**Results:** Bovine and human incisor’s enamel was mainly composed of Hunter-Schreger Bands (HBS) and parallel prisms (PP). HBS mainly located in most labial inner enamel and cingulum of lingual inner enamel while PP located in all the outer enamel, cervical region and incisal ridge. A transition zone was found between parazone and diazone within an HBS of bovine incisors, but not in human incisors. Interprisms appeared as thicker plate-like structures and decussated with prisms in bovine incisors, but were thin and round prisms in human incisors. Thicker PP in cingulum and thinner interprisms in whole enamel were main two characteristics of human maxillary central incisors.

**Conclusion:** Bovine incisor’s enamel was characterized as thicker plate-like interprisms, a transition zone between parazone and diazone within an HBS, and prism/interprism decussating plane, but not in human incisors. Differences of enamel microstructure between bovine and human incisors should be taken into consideration when bovine teeth were substituted as human teeth for dental research.

**FC023**

**Adhesion of C. albicans and E. faecalis to Various Dental Filling Materials**

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To evaluate adhesion of Candida albicans and Enterococcus faecalis microorganisms to amalgam (Cavex Avalloy (Harlem, Holland), composite; Tetric N-Ceram (Ivoclar, Vivadent), flowable composites; SDR (Dentsply, DeTrey, Germany) and Premise (Kerr, Orange, CA), glass ionomer; Kavitron Plus (Spofa Dental, Jinic, Czech), ZnOE cement; Alganol (Kemdent, Wiltshire, UK), Zinc Phosphate cement; Adhesor (Spofa Dental, Jinic, Czech) and com- pomer; Dyract AP (Dentsply DeTrey, Konstanz, Germany) surfaces.

**Methodology:** Standardized ten discs were prepared from each material and sterilized under Ultraviolet light for 24 h. The discs were then randomly assigned to two groups (n = 5) according to test microorganism used and were either incubated with C. albicans (ATCC90028) or with E. faecalis (A197A) aerobically for 48 h. After incubation fungal and bacterial adherence was determined by using a colorimetric XTT assay. Data were statistically analyzed by using ANOVA and Tukey HSD tests (p = 0.05).

**Results:** E. faecalis adhered statistically significantly to amalgam and Alganol surfaces (p < 0.05). C. albicans also adhered statistically significantly to amalgam and Alganol surfaces (p < 0.05). C. albicans adhered more to zinc phosphate cement Adhesor’s, and flowable composites; SDR and Premise surfaces than E. faecalis (p < 0.05). E. faecalis and C. albicans adhered equally to glass ionomer cement Kavitran Plus.

**Conclusion:** Within the limitation of this in vitro study it can be concluded that these materials should be polished in order to prevent or reduce bacterial and fungal adherence to their surfaces.

**FC024**

**The Effect of Parylene Coating on Some Properties of PMMA**

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**Aim:** The aim of the present study was to investigate the effect of surface coating of PMMA with Parylene-C, a novel biomedical coating, on water sorption, solubility and staining.

**Materials and methods:** Specimens were fabricated using heat-polymerizing polymethyl-methacrylate (PMMA) and divided into
two groups, uncoated PMMA and coated with Parylene-C. Twelve specimens of each group were subjected to water sorption and solubility tests in distilled water according to ISO 20795-1:2008 for denture base polymers. A further 24 specimens of each group were exposed to a staining test by being divided into two subgroups for soaking in distilled water or coffee solution for 1 week. CIE L*a*b* values of all samples were obtained using a digital camera imaging and appropriate image analysis software, and compared before and after exposure to the staining test. Total colour differences (ΔE) and lightness values (L*) were calculated. Non-parametric Mann-Whitney tests were used for statistical analysis with the level of significance set at p < 0.01.

**Results:** Coated PMMA samples showed significantly less water sorption while no difference was noted in solubility. The coating did not have a significant effect on ΔE values after the staining tests, but the L* values in coated samples were significantly higher compared to the uncoated ones. Significant L* value reduction occurred for uncoated PMMA, while the coated samples were not affected.

**Conclusion:** Parylene-C coating of PMMA caused significant reduced water sorption but no effect was observed in the solubility and staining.

**FC025**

**Antibacterial Effects of Conventional Glass Ionomer Cement Following Incorporation of Benzalkonium Chloride and Cetylpyridinium Chloride**

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**Background:** The antibacterial activity of conventional glass ionomer cement against three different microorganism strains alone and following incorporation of 1%, 2% and 3% Benzalkonium Chloride and Cetylpyridinium Chloride was evaluated.

**Methods:** The agar diffusion method was used to determine the inhibitory effect of the conventional glass ionomer cement ChemFlex on *Streptococcus mutans*, *Lactobacillus casei* and *Actinomyces viscosus*. Bacterial strains were inoculated into BHIB, and incubated in an anaerobic atmosphere (37°C). From the bacteria grown in the liquid medium, the density of the inoculum was set to be equivalent to McFarland 2 standard. In Shaedler agar, 350 µl of the bacterial suspension were equally spread. Specimens (4 mm × 6 mm) were prepared from the cement with and without addition of 1%, 2% and 3% Benzalkonium Chloride and Cetylpyridinium Chloride. The inhibition zones were determined after 48 h, after 7 days and after 21 days of incubation.

**Results:** The glass-ionomer cements with no antimicrobial compounds incorporated either form very small inhibition zones or form no zones at all. The combination ChemFlex + Benzalkonium Chloride has the best effect on the three analysed bacteria. The Benzalkonium Chloride antibacterial compound has a stronger antibacterial effect than Cetylpyridinium Chloride.

**Conclusions:** Glass ionomer cements can potentially be used as a medium for slow release of active antimicrobial components, and they have the potential to improve clinical outcomes of the cements.

**FC026**

**Biocompatibility of Two Different Restorative Materials Used in Pediatric Dentistry**

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**Aim:** Common biocompatibility problems with some of the current dental materials include chemical leakage from the material, pulpal irritation and less commonly allergy.

The aim of our investigation was to make a comparative analysis of the biocompatibility of two different restorative materials used in children.

**Materials:** Eighteen male albino rats (Wistar) weighing 200–250 mg were used in this study. Test material was freshly prepared as advised by the manufacturer and placed in a polyethylene tube (5 mm long/3 mm internal diameter). For material implantation, the dorsal skins of the animals were shaved under ketamine (25 mg/kg) anesthesia and disinfected with 5% iodine solution. Three incisions were made on the back of each animal, on the dorsal surface of the front limbs and on the dorsal pelvic area. Each animal received one tube filled by glassionomer cement and comparator. For control purposes, empty polyethylene tubes closed from both sides by heat were implanted on the dorsal surface of the left back limb. The histological evaluations were performed 1, 3 weeks and 45 days post implantation.

At each period, the rats were sacrificed by anesthetic overdose; the tubes and surrounding tissues were removed by tissue dissection technique and fixed in 10% buffered formalin at pH 7.0. Comparative histological analysis were made.

**Results:** One week post implantation at the control and experimental group, microscopic examination revealed the strongest inflammatory reaction despite another three examal periods.

**Conclusions:** All materials in current use are considered acceptable, in terms of their biocompatibility with local tissues, when properly handled and placed.

**FC027**

**Biodentine’tm – A Biomaterial for Endodontic Applications – Clinical Cases**

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The aim of this investigation was to make a comparative analysis of the biocompatibility of two different restorative materials used in children.
FC028

**Bisphenol A Elution from Dental Resins: The Effect of Temperature**

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**Aim:** Bisphenol A (BPA) elution from baby bottles into content has been of great public interest and debate in recent years. Uncontrolled BPA elution due to temperature increase may create a risk factor for human health. However, dental resins that are used in pediatric dentistry also have BPA derivatives. The aim of this study is to evaluate BPA elution from dental resins and to determine the effect of temperature increase on this elution.

**Methods:** Four dental resins containing BPA derivatives (Filtek Z250, Filtek Supreme XT, Fissurit FX, and Admira) and a control group (BPA free G-3a) were used in this study. Each specimen was stored in 2 ml of 75% ethanol-water solution at 37°C. Water at a temperature of 59 ± 1°C (preferred temperature of hot drinks) was added to the study samples at certain time intervals (1, 6, 24 h, 2, 3, 4, 5, and 6 days). The methanol samples were analyzed using high-performance liquid chromatography (HPLC). Data was analyzed using multivariate and repeated measures analysis of variance (p < 0.05).

**Results:** The study samples generally eluted more BPA than the control samples (p < 0.05). The greatest amount of BPA for an individual time period was measured after 6 h for the groups A-B-C-D; the same was found after 24 h for group E. Although the temperature increase due to hot drink consumption caused increased elution of BPA from dental resins, the amounts were within safety margins.

FC029

**Seven Year Clinical Evaluation of Filtek™ Silorane vs. Tetric Ceram**

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**Aim:** The purpose of this clinical investigation was to evaluate the performance of FiltekTM Silorane (3M ESPE), a low shrink composite, used in conjunction with a dedicated experimental adhesive system, that was never commercialized, and compare to Tetric Ceram bonded with AdheSE (Vivadent).

**Methods:** The materials were placed in teeth in individuals that needed at least two box shape class II restorations of similar size. The restorations were placed by one operator in private practice. A total of 53 restoration pairs were placed in 31 patients. The restorations were evaluated by two trained examiners using USPHS criteria. The study was accepted by the National Bioethics Committee and the Privacy Commission of Iceland.

**Results:** At 7 years 50 restoration pairs were available for reevaluation. Color match and gingival status was unchanged and neither secondary caries nor sensitivity reported. All but three contacts scored normal. Only slight chipping and surface roughness was reported for both materials. When marginal integrity was evaluated about 2/3 scored Alfa for both materials and only 38% Tetric and 34% Silorane restorations scored Alfa for interfacial staining. For anatomic form (wear), 38% Tetric and 72% Silorane scored Beta and one Silorane restoration (2%) Charlie. There was no significant difference between the materials tested for any of the criteria evaluated except anatomic form (p < 0.001).

**Conclusions:** At 7 years, Filtek Silorane showed significantly more wear than Tetric Ceram. High incidence of marginal discoloration and marginal breakdown observed for both materials suggests that improved or different adhesive systems are needed.

FC030

**Detecting Surface Roughness of Posterior Composites After Different Polishing Techniques with Atomic Force Microscopy**

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**Aim:** The having smooth surface and adequate polymerization of composite restorations greatly effects the success and clinical lifetime of restorations. After curing of the resin composites different systems could be used for finishing and polishing procedures. This in vitro study evaluates the effect of two different polishing systems (one step and multistep) on four posterior resin composites with atomic force microscopy.

**Methodology:** For each composite, 30 standard circular specimens were prepared: ten specimens were polished for each different method, while ten specimens were used as controls. Surface roughness was determined with atomic force microscopy by using roughness parameters (Ra).
Results: The results obtained indicated that, the smoothest surfaces were obtained in control groups. AFM showed that the multi-step polishing method had smoother surface than one-step (p = 0.00). However no statistical differences were observed between different composite resins. (p = 0.103)

Conclusion: Based on the results obtained, it was concluded that, the composite resin which was polished with multi step system could have a smoother surface, if compared to the other system tested.

FC031
Calcium Hydroxide Iodoform Paste in Vital Pulpotomy – Randomized Controlled Study
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Background: Despite modern advances in dental caries prevention, many teeth are still lost prematurely. Pulpotomy has been conducted with various medicaments over the years. Formocresol pulpotomy has enjoyed long term clinical use and success, but concerns over toxicity and mutagenicity have prompted research into alternative dressing materials. Several researches have studied incorporation of other substances to calcium hydroxide aiming to improve some of its properties. Among these medicaments is Metapex, a silicone oil-based calcium hydroxide paste containing 38% iodoform. Though Metapex is commonly used in treatment of necrotic primary teeth, few studies reported its use in treatment of vital primary teeth.

Aim of this randomized controlled study is to compare clinical and radiographic success rates of Metapex to formocresol in pulpotomy of vital primary molars.

Methods: Three hundred asymptomatic, carious, vital primary molars in patients aged 2–7 years old were randomly assigned to receive either formocresol or Metapex after vital pulpotomy. Treated molars were restored by stainless steel crowns. Clinical and radiographic assessments were performed at 3, 6 and 12 months postoperatively.

Results: There was no significant difference in clinical and radiographical success rates of formocresol and Metapex. Radiographic assessments revealed that all treated molars did not show any signs of intracanal resorption throughout the follow up period.

Conclusion: Calcium hydroxide iodoform paste showed comparable results to formocresol in treatment of asymptomatic carious primary teeth indicated for vital pulpotomy.

FC032
Can Hydrophilic Fissure Sealants be Acceptable Alternative to Hydrophobic Sealants?
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Purpose: The aim of this laboratory study was to compare microbial leakage of a new hydrophilic sealant with a conventional hydrophobic resin-based sealant.

Materials and methods: One hundred caries-free extracted human maxillary premolars were randomly divided into five groups. Teeth in groups I, II and III were sealed with hydrophilic sealant on dry, wet and artificial saliva-contaminated occlusal surfaces, respectively. Teeth in groups IV and V were sealed with a hydrophobic sealant on dry and wet occlusal surfaces, respectively. A newly designed microbial penetration method with Streptococcus Mutans as an indicator was used for leakage assessment. Data was analyzed using SPSS 15.0 software and the significance level was set at α = 0.05.

Results: The log-rank test indicated a statistically significant difference in leakage rates among the five groups. Mantel-Cox log-rank test showed that group III had the most leakage rate and groups II and IV had the least leakage rates. There was no statistically significant difference between leakage rates of groups II and IV.

Conclusions: With respect to the limitations of an in vitro study, it may be conclude that from the microleakage aspect, hydrophilic sealant may be used as an acceptable alternative to hydrophobic sealant.

FC033
Clinical Evaluation of a Self-Adhering Flowable Composite as a Class 1 Restorative in Primary Molars: 12 Months Results
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Aim: The purpose of this study was to evaluate a self-adhering flowable composite and compare its 12 month clinical performances with a commercially available self-etch adhesive/composite system in Class I restorations of primary molars.

Design: Thirty-one patients (13 male, 18 female) were recruited into the study. A total of 62 Class I cavities were restored with either a self-adhering flowable composite or a commercially self-etch adhesive/composite system according to manufacturers’ instructions. The restorations were clinically evaluated 1 month after restoration, and after 3, 6 and 12 months post-operatively using modified USPHS criteria by two previously calibrated operators. Statistical analysis were performed using SPSS 16.0 statistical package.

Results: All patients attended the 1, 3, 6 and 12-month recall. Lack of retention was not observed in any of the restorations. With respect to color match, marginal adaptation, secondary caries and surface texture, no significant differences were found between two restorative materials tested after 12 months (p > 0.05).
Conclusions: Clinical assessment of self-adhering flowable composite exhibited good clinical results with predominating alpha scores after 12 months. However, further evaluations are necessary for the long-term clinical performance of this material.

FC034
Color Stability of Anterior Restorations After Different Polishing Techniques
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Aim: The purpose of this study was to investigate the effects of different finishing-polishing techniques on the color stability of various anterior restoration materials after storing in staining solution.

Materials and methods: A composite resin (Admira, VOCO), a compomer (Dyract, Dentsply/De Trey) and a resin-modified glass ionomer (Fuji II LC, GC) were used to prepare 120 specimens (10 mm in diameter, 2 mm in depth). Specimens were randomly divided into four subgroups according to finishing-polishing systems; a series of polishing discs (Sof-Lex; 3M/ESPE), a liquid finishing-polishing material (Biscover; Bisco Inc), polishing wheels and pastes (Enhance Dentsply/DeTrey) and a control group (with no polishing) (n = 10/group). After storing in distilled water at 37°C for 24 h, the specimens were stored in coffee solution during 48 h at 37°C. Colorimetric values of the specimens before and after storing in coffee solution were measured using the spectrophotometer (Easyshade, Vita Zahnfabrik). The CIE L*a*b system was used for the determination of the color differences. Data were analyzed using ANOVA and Tukey’s test.

Results: The color differences were affected by the material type (p < 0.05) and finishing-polishing systems (p < 0.05). The composite resin showed the best color stability; however the color differences of the specimens of all groups were visually appreciable also for the nonskilled operator (ΔE*a*b > 2.5).

Conclusion: The results of this study suggest that all restorative materials demonstrated measurable color changes after storing in staining solution regardless of the finishing-polishing systems.

FC035
Comparison of Anesthetic Efficacy of Intraligamentary and Supraperiosteal Anesthesia by Using Computer Controlled Delivery System
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Purpose: The purpose of this study was to compare anesthetic efficacy and patient comfort of intraligamentary anesthesia vs. supraperiosteal anesthesia by using computer controlled anesthesia delivery system in different operative procedure of deciduous teeth.

Materials and methods: The study was a randomized clinical trial which comprised 90 children (58 girls, 42 boys), who required same operative procedure (pulpotomy, extraction or restorative procedure) on their left and right first mandibular primary molars. The study consisted of two visits for each child. In first visit, left or right deciduous tooth was treated after intraligamentary anesthesia and in second visit, contralateral deciduous tooth were treated after supraperiosteal anesthesia by using computer controlled anesthesia delivery system. Totally 180 injections (90 periosteal and 90 intraligamental) were administered. In each visit, the severity of pain during injection and operative procedure was evaluated by using Wond-Baker Faces Pain Rating Scale. A post injection questionnaire was asked the subjects to rate the comfort and any side effects. The results were recorded and data were analyzed statistically.

Results: There were no statistically significant differences for anesthetic efficacy during any operative procedures in the Wond-Baker Faces Pain Rating Scale Scores between intraligamental and supraperiosteal anesthesia (p > 0.05). However, postoperative complications in supraperiosteal anesthesia were significantly more than intraligamental technique.

Conclusions: Fortunately, most pediatric patients do not encounter problems related to prolonged soft tissue anesthesia. Intraligamental anesthesia with computer controlled anesthesia delivery system may be an alternative for overcoming postoperative complications.
Effect of Different Surface Treatments on Shear Bond Strength of Fissure Sealants

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Aim: The aim of this in vitro study was to evaluate the shear bond strength of fissure sealant to enamel treated with Er:YAG laser (MSP and QSP mode) and acid etching with/without drying agent.

Material and methods: Thirty permanent human molars were used in this study. The roots sectioned 2 mm coronal to the cemento-enamel junction. The crowns were mesiodistally sectioned providing 60 halves that were embedded in acrylic resin. The enamel was flattened and a 2 mm diameter bonding area was demarcated. Ultraseal XT Plus sealant (FS) was applied in all groups. Specimens were randomly assigned to six groups (n = 10); G1: 37% phosphoric acid + Prima Dry + FS; G2: 37% phosphoric acid + FS, G3: Er:YAG (MSP mode) + Prima Dry + FS; G4: Er:YAG (MSP mode) + FS; G5: Er:YAG (QSP mode) + Prima Dry + FS; G6: Er:YAG (QSP mode) + FS. After 24 h storage in distilled water, shear bond strength of samples were tested in a universal testing machine. Statistical analysis using Kruskal-Wallis and Mann-Whitney U test was used to compare the respective groups.

Results: The SBS results (MPa) were the following: G1: 11.33, G2: 9.76, G3: 8.65, G4: 7.72, G5: 4.49, G6: 2.73. There were significant differences amongs the groups (p < 0.05).

Conclusion: The acid etching surface application showed better performance than laser surface treatment in both MSP and QSP mode. Drying agent may be used for enamel surface prior to sealant application.

Temperature Changes in the Pulpal Chamber of Primary Tooth

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Aim: The purpose of this study was to investigate the pulpal temperature increase induced during the polymerization of colored polyacid-modified composite resins (PMCR) in pulpal chamber of primary tooth.

Methods: A non-retentive class II cavity was prepared in an extracted primary molar tooth, leaving a dentin layer in 1 mm thickness between pulp chamber and proximal cavity wall. Different colored (gold, blue, green, berry) PMCR (Voco, Germany) was placed to the cavity in two stages. In first stage; PMCR was placed to the proximal surface and polymerized. In second stage; PMCR was placed to the occlusal surface and polymerized with LED curing unit. Temperature rise during polymerization of colored PMCRs were measured with a J-type thermocouple wire that was connected to a data logger. Data were analyzed with two way ANOVA and Mann Whitney U tests.

Results: Among the colored PMCR groups tested, the gold colored PMCR group induced the highest temperature increase in both proximal and occlusal surfaces. The first stage of application induced significantly higher temperature increases in pulp chamber than the second stage of application in all groups (p < 0.05).

Conclusion: The colored PMCRs induced higher temperature increases on the proximal surface than the occlusal surfaces. During polymerization of all colored PMCRs tested, the temperature increases recorded for all groups were above the critical value of 5.6°C that can cause irreversible harmful changes in pulp tissue.
A 4-Year Retrospective Study of All-Ceramic Onlays
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Objectives: The purpose of this study was to evaluate the survival rate, failure and clinical quality of all ceramic onlays retrospectively in 4 years.

Methods: All restorations placed during the period September 2007–December 2011 at Marmara University Dentistry Faculty Department of Prosthodontics were included. Patients with para-functional habits were excluded from the study. In 37 patients, 59 onlays were examined. Number of restorations failures and reasons for failure were recorded. The remaining ceramics were evaluated by CDA criteria (color match, anatomical form, marginal discoloration, marginal integrity and surface texture) by two clinicians after 2–6 years. The patients also evaluated their restorations in five categories (color, surface, fonation, hygiene and bite efficiency) on a scale of 1–10.

Results: A survival rate of 83% was recorded. Six (10.16%) of the 59 restorations had to be replaced. The main reasons for failure were four decementation (6.8%), four endodontic treatment need (6.8%) and one extensive restoration need (0.06%), three ceramic fracture (5.08%), one tooth fracture (0.06%). On the other hand patient satisfaction score was found mostly over 8 and none of the patients rated under 3.

Conclusion: In this study, location of teeth in dental arch and marginal integrities of teeth influenced restoration failures.

Clinical Performance of Tooth-Supported and Implant-Supported Zirconia-Based Fixed Dental Prostheses
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Purpose: Zirconia-based prostheses are commonly used in prosthetic dentistry for aesthetic crowns and fixed restorations, although follow-up data are limited, especially for implant-
supported crowns. The aim of this retrospective study was to evaluate the clinical performance of tooth supported and implant supported zirconia-based FDPs with the assessment of patient satisfaction.

**Material and method:** Ninety patients with zirconia- ceramic FDPs, restored between 2004 and 2010 were called randomly. Seventy patients were reached and 36 patients accepted the invitation for clinical evaluation to the Department of Prosthodontics, University of Marmara Faculty of Dentistry. Tooth supported FDPs were examined with a survey including (i) Modified CDA criterias. (ii) plaque index, (iii) gingival index, (iv) complications, (v) sensitivity, (vi) secondary caries. Implant supported FDPs were examined with a survey including (i) Modified CDA criterias. (ii) plaque index, (iii) gingival index, (iv) complications.

**Results:** Thirtyfour female, 22 male patients were examined clinically. Number of patients with tooth supported FDPs were 23, implant supported FDPs were 20. Fifteen patients have both tooth supported and implant supported FDPs. Major complication of tooth-supported FDPs is tooth sensitivity (18.4%). Minor chipping is the most common complication both of the tooth-supported FDPs (10.5%) and implant-supported FDPs (10.7%).

**Conclusion:** Based on the intraoral examination, zirconia-ceramic restorations are successful treatment alternative with minor complications. Most of the patients who participated in recall study, were satisfied with their prostheses in terms of colour, surface and function.

**FC044**

**Color Interaction of Screw Hole Filling Materials in Implant Restorations**

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**Purpose:** The purpose of this study was to investigate the esthetic outcome of composite access hole filling materials and masking ability of opaque layer for screw-retained implant supported restorations.

**Materials and methods:** Two Ni-Cr cylindrical metal molds with a hole in the center were combined with either resilient composite (RC) (Clip, Voco) or restorative nanocomposite [enamel (A2E), dentin (A2B), dentin (A2B) [Filtek™ Ultimate Universal, 3M ESPE]] disc-shaped (8 × 1 mm) specimens. The metal mold and composite disc combinations were generated as follows; Group (Gr) 1 = 0.5 mm opaque (O) + A2E + A3B + RC, Gr2 = O + A2B + A2B + RC, Gr3 = A2B + A2B + RC, Gr4 = A2E + A3B + RC, Gr5 = RC + RC + RC. A Ni-Cr disc fused Shade A2 ceramic (VMKMaster™, Vident), was used for control group color measurements. The specimens were analyzed with a spectrophotometer (Easy Shade; VITA Zahnfabrik H), and data were obtained in the CIE Lab color system. The recorded data were analyzed with Kruskal–Wallis analysis of variance and Mann–Whitney U test was applied for post hoc comparisons (p < 0.05).

**Results:** The layering of composite in different shades and application of opaque layer to the inner surface of the experimental mold significantly affected the color (p < 0.01). The lowest ∆E values were obtained in opaque combined with dual layer composite (Gr1) where the highest ∆E values were obtained in the resilient composite (Gr5). No significant difference was observed between groups Gr3 and Gr4 (p > 0.01). The application of opaquer to the metal surface combined with dual layer composite, may significantly contribute to the color matching between metal fused ceramic and access hole filling for screw-retained implant restorations.

**Free Communication Session 06 | B342 | 28.08.2013 | 11:30–12:30**

**Theme:** Dental Treatment and Restorative Dentistry: Materials

**FC046**

**Microleakage of Class V Composite Restorations Prepared by Er,Cr:YSGG Laser**

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**Objective:** To evaluate restorations microleakage in cavities prepared by Er, Cr: YSGG laser and bonded with three types of adhesive systems.

**Materials and methods:** Class V cavities were prepared in 24 third molars on buccal by bur and lingual by Er, Cr: YSGG laser. Samples were bonded with (Total etch, Adper Single Bond 2, USA; One step self-etch, OptiBond All In One, Kerr, USA; and Two step, Clearfil SE, Kuraray, Japan). Cavities were restored in bulk with composite. Restorations were polished, stored, thermocycled in water bath and immersed in methylene blue solution for 24 h. Dye leakage was assessed by stereomicroscope at ×10. Data were analyzed with Kruskal–Wallis and Mann–Whitney at 5% significant level. Additional samples were prepared examined under SEM.

**Results:** Significant differences were found between bur and laser groups in one step adhesive. Also one step adhesive demonstrate higher leakage than two steps in bur cavities. No significant differences were found between restorations in laser group (p > 0.05). In bur prepared cavity SEM observation shows flat topography with smear layer. Laser cut dentin shows a corrugated or wavy profile, opened dentinal tubules and absence of a smear layer.

**Conclusions:** Microleakage of resin composite restorations was influenced by adhesive type. Bur prepared cavities bonded with one step self-etch were more prone to leakage than total etch and two step. Also one step demonstrated more leakage in bur cavities than those prepared by Er, Cr: YSGG laser.

**FC047**

**Cytotoxicity of a Self-Adhesive Resin Luting Cement with L-929 Fibroblast Cell Line**

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1*Department of Prosthodontics, Faculty of Dentistry, Ankara University, Turkey*; 2*Department of Microbiology, Faculty of Medicine, Ankara University, Turkey*

**Objective:** The aim of this study was to compare the cytotoxicity of a self-adhesive resin luting cement on L-929 fibroblast cells
The results show the importance of light irradiation into each well. Cell survival was determined by using MTT assay. Differences in cell viability as to the dual polymerized groups for all the time intervals (p < 0.05). Considering the preincubation periods, the highest and lowest cytotoxicity values were obtained from 2- and 7-day specimens in both chemically and dual polymerized groups respectively (p < 0.05).

Conclusion: The results show the importance of light irradiation for dual cure effect on the cytotoxicity of the self-adhesive luting cement evaluated.

Effect of Different Adhesive Systems and Chlorhexidine on Matrix Metalloproteinase
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Aim: This study evaluated the effects of adhesive systems and treatment of dentin surfaces with chlorhexidine digluconate (CHX) followed by adhesive systems to the matrix metalloproteinases (MMPs) in the dentin matrix. In addition to this, the bond strength of adhesive systems to dentin in vitro conditions was also investigated.

Materials and methods: This study consisted of two parts: gelatin zymography and the microtensile bond strength test. For gelatin zymography, seven groups each contains 1 g dentin powder were obtained to assay dentin MMPs activity. These groups were, mineralized dentin group, incubation of mineralized dentin powder with three different adhesive systems (Adper Scotchbond Multi Purpose, Clearfil SE Bond and Adper Prompt L-Pop) and incubation of mineralized dentin powder with CHX followed by three different adhesive systems application. For microtensile bond strength test, six groups (n = 5) were obtained in which three different adhesive system and these three different adhesive system treated with CHX were applied to the superficial dentin. Fractured surfaces were later analyzed with stereo and scanning electron microscopes to determine the type of failure. Data were analyzed with one-way ANOVA, t-test and Scheffe multiple comparisons tests.

Results: Zymograms showed that incubation of mineralized dentin powder with Adper Scotchbond Multi Purpose increases MMP 2 activity, while CHX pre-treatment inhibited MMP 2 activity. CHX increased the bond strength of adhesive systems, but there was no significant statistically difference among these groups. The study demonstrates the efficacy of CHX inhibition of MMPs and increase in bond strength of adhesive systems.

Theme: Dental Treatment and Restorative Dentistry: Prosthetics

FC049
Mechanical Properties of Autocuring Temporary Crown and Bridge Materials
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Aim: Temporary prostheses are applied prior to permanent prosthetic restorations, in order to protect prepared teeth, get an idea about the resulting prosthesis and avoid migration of teeth towards the spacing. The aim of this study was to compare mechanical properties of four different bis-acrylic composite based materials and methacrylate resin temporary crown and bridge (C&B) material as a control group.

Materials and methods: Five different temporary C&B materials (Luxatemp AM Plus/ DMG, Structur Premium/VOCO, Kingscross/KETTENBACH, Tempoit Premium/ DETAX, Temdent Classic/SCHUTZ) were used to fabricate bar shaped specimens (2 mm × 2 mm × 25 mm, ISO 4049:2000) (n = 50). Flexural strength and flexural modulus of these specimens were subjected to a three point bending test after thermal cycling (5000x, 5–55°C). Mean values and standard deviation of all measurements were calculated and data was subjected to parametric statistics in SPSS (p < 0.05).

Results: Difference among both flexural strength and flexural modulus values of temporary C&B material groups investigated were statically significant. The highest flexural strength and modulus values were observed in Luxatemp AM Plus, where the lowest flexural strength and flexural modulus values were recorded with Tempoit Premium (90.97 ± 17.9 MPa [flexural strength], 2788.63 ± 167.36 MPa [flexural modulus], 34.03 ± 14.9 MPa [flexural strength], 609.50 ± 248.30 MPa [flexural modulus] respectively).

Conclusions: Among the groups investigated, the highest values for both flexural strength and flexural modulus were observed in temporary C&B material Luxatemp AM Plus.

Theme: Dental Treatment and Restorative Dentistry: Esthetics

FC050
Bleaching Efficacy and Color Stability of Over-The-Counter Products
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Aim: This study evaluated the effects of adhesive systems and treatment of dentin surfaces with chlorhexidine digluconate (CHX) followed by adhesive systems to the matrix metalloproteinases (MMPs) in the dentin matrix. In addition to this, the bond strength of adhesive systems to dentin in vitro conditions was also investigated.

Materials and methods: This study consisted of two parts: gelatin zymography and the microtensile bond strength test. For gelatin zymography, seven groups each contains 1 g dentin powder were obtained to assay dentin MMPs activity. These groups were, mineralized dentin group, incubation of mineralized dentin powder with three different adhesive systems (Adper Scotchbond Multi Purpose, Clearfil SE Bond and Adper Prompt L-Pop) and incubation of mineralized dentin powder with CHX followed by three different adhesive systems application. For microtensile bond strength test, six groups (n = 5) were obtained in which three different adhesive system and these three different adhesive system treated with CHX were applied to the superficial dentin. Fractured surfaces were later analyzed with stereo and scanning electron microscopes to determine the type of failure. Data were analyzed with one-way ANOVA, t-test and Scheffe multiple comparisons tests.

Results: Zymograms showed that incubation of mineralized dentin powder with Adper Scotchbond Multi Purpose increases MMP 2 activity, while CHX pre-treatment inhibited MMP 2 activity. CHX increased the bond strength of adhesive systems, but there was no significant statistically difference among these groups. The study demonstrates the efficacy of CHX inhibition of MMPs and increase in bond strength of adhesive systems.
Objective: Although demand for over-the-counter tooth bleaching products has increased in recent years, little is known regarding their efficacy and color stability. Therefore, the purpose of this study was to compare bleaching efficacy and color stability of two over-the-counter products with that of an at-home bleaching agent, considering severity of tooth discoloration.

Materials and methods: Ninety enamel-dentin samples were stained by Orange II dye and assigned into lightly (65 ≤ L* ≤ 75) and darkly (L* < 65) stained groups. Teeth were divided into three subgroups (n = 15): 10% hydrogen peroxide pre-loaded tray (Treswhite Supreme), 22% carbamide peroxide pen (Hollywood Smiles), 10% carbamide peroxide at-home bleaching agent (Opalescence Oh). All products were applied according to manufacturers’ instructions. Teeth were then re-stained using red wine for 9 days. A dental spectrophotometer was used, baseline/post-bleaching (ΔE1) and post-bleaching/re-staining (ΔE2) color differences were determined. The data were analyzed using nested ANOVA and post-hoc tests (p = 0.05).

Results: No differences were observed between ΔE1 values for Treswhite and Opalescence in lightly stained teeth (p < 0.05), while Opalescence had the highest value in darkly stained teeth (p < 0.05). Hollywood Smiles had the lowest mean ΔE1 and ΔE2 values (p < 0.05) in both lightly and darkly stained teeth, while no differences were observed between ΔE2 values for Treswhite and Opalescence.

Conclusion: Tray-based over-the-counter product produced better bleaching efficacy, but worse color stability compared to whitening pen. Its bleaching efficacy was also similar to at-home bleaching agent in lightly stained teeth. Teeth in darkly stained group revealed higher ΔE1 values than their lightly stained counterparts with each product.

FC051
Chromatic Analysis of a Nano-Hybrid Composite Exposed to Different Whitening Mouth Rinses
Osman Tolga Harorl, Çagatay Barutcigil
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Objective: The aim of this study was to evaluate the effect of whitening mouth rinses on the color parameters of a nano-hybrid composite.

Materials and methods: Seventy composite resin disks (8.0 × 1.0 mm) were fabricated from a nano-hybrid composite resin. (3M ESPE Z550). At the beginning, samples were stored in distilled water 24 h. The initial color parameters of composite samples were measured with a clinical spectrophotometer according to the CIELAB color scale and then composite samples were randomly divided into seven groups (n = 10). A total of six whitening mouth rinses; three hydrogen peroxide including (Listerine Whitening Vibrant, Scope White, Crest 3D White) and three non hydrogen peroxide including (Oral-B 3D White, Signal White, Colgate Optic White) were tested. Distilled water was used as a control. After 1 and 24 h exposure periods color measurements were repeated and color changes were analyzed, ΔE* values over 3.3 were considered as clinically unacceptable. Statistical differences were analyzed using ANOVA and Tukey’s post hoc tests.

Results: Non of the groups had an unacceptable color change. One hour exposure to solutions caused color changes between 0.97 (Listerine Whitening Vibrant), and 2.32 (Oral-B 3D White) where ΔE* for control group was 0.67. Also after 24 h, ΔE* values were in range of 0.65 (Listerine Whitening Vibrant) and 2.73 (Oral-B 3D White) (Control ΔE* = 0.61).

Conclusions: We can conclude that tested whitening mouth rinses are not capable to cause perceptible color changes on selected novel composite resin in vitro.

FC052
Correction of Crowding Teeth in Adults, Simple Approaches.
Case Report
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Introduction: Many patients have slightly crowded or overlapping anterior teeth. There is no doubt that the best way to treat the anterior crowding in the upper and in the lower arches requires the bonding of brackets to the teeth. However, often the adult patients are unable to accept this comprehensive orthodontic procedure. Choosing the correct approach is the most important aspect of the treatment.

The aim of this cases report presentation is to explain different clinical applications, from minor tooth movement by using a 0.014 NiTi at lingual/palatine arches, restorations using bonding, laminate or crowning, to recontouring/striping, extraction or a combination of these procedures, in order to achieve correction of the crowded teeth.

Case presentations: We established the most appropriate approach for the potential treatment options thorough evaluation of the patient needs and expectations. This treatment enabled a good tooth alignment in a short period of time and a very good aesthetic in such simple ways. Our results will be presented through different case reports.

FC053
Different Light Sources and Pulpal Temperature Rise During Office Bleaching
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Aim: The aim of this study is to evaluate the temperature rise induced by various light sources during office bleaching treatment, under simulated pulp blood microcirculation conditions.

Methods: Thirty freshly extracted human maxillary central incisors were distributed into three groups. The root portions of the teeth were removed, apical access to the pulp chambers was enlarged and teeth were fixed on an apparatus for the simulation of pulp blood microcirculation. A thermocouple wire was inserted...
FC054

Effect of Bioactive Silica and Bleaching on Caries Like Lesions

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Aim: This study was carried out to detect the progression of enamel caries-like lesions following bleaching in terms of change in mineral content using chemical analysis and surface roughness measurements. And to test the remineralizing ability of bioactive silica (BS), sodium fluoride (FG) and a combination of casein phosphopeptide-amorphous calcium phosphate and fluoride (GC) on bleached enamel caries-like lesion.

Material and methods: A total of 90 freshly extracted sound human permanent anterior teeth were used in this study. Caries like lesions were induced in the specimens by Ph cycling protocol, teeth were divided into two main groups for bleaching with (Illumine™[IL] or Opalescence PF [OP]), then further subdivided into three subgroups for remineralization, Calcium and phosphorous weight percentages and surface roughness were measured using Environmental scanning electron microscope (ESEM) and Energy Dispersive Analytical X-ray (EDAX) of the ESEM.

Results: Surface roughness (Ra) results revealed that OP showed statistically significant highest mean Ra value compared with IL and control groups, Ranking between different groups of post bleaching remineralization OP + FG group and OP + GC showed statistically significant low mean surface roughness. Calcium weight percentages of OP group were significantly highest, where IL + FG treated group showed statistically significant lowest mean calcium weight percent.

Conclusions: In office dental bleaching with 30% hydrogen peroxide product doesn’t influence the progression of caries like enamel lesions. Topical application of BS, FG and GC was effective at reducing enamel surface roughness after bleaching.

FC056

Minimal Fungicidal Concentration of Aloe Vera to Candida albicans in HIV People

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Oral candidiasis is the third major opportunistic infection in people with HIV/AIDS. Severe oral candidiasis occur due to immune compromise condition in people with HIV/AIDS. This condition can lead to candidemia and possibility to cause death. Some antifungal drugs have been used to eliminate oral candidiasis, and
Aim: To find MFCs of Aloe vera leaf extract to Candida albicans strain. Whereas MFCs is important to be measure for clinical treatment. Material and method: Aloe vera leaf was soak into ethanol for 48 hours. To find MFCs, Aloe vera leaf extract, one sample showed at 12.5%, three samples at 100%, and four samples still show the growth activity of C. albicans in 100%. For C. albicans ATCC 10231 strain, extract Aloe Vera leaf has MFC at 75%.

Conclusion: Aloe vera leaf extract has a promising antifungal effect even for a severe oral candidiasis. The various concentration of MFCs showed different reaction towards severity of disease.

Salivary Markers for Oral Lichen Planus Disease Activity and Dysplasia
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Aim: To verify the usefulness of salivary markers for monitoring oral lichen planus (OLP) lesions severity and premalignant potential.

Materials and methods: Fifty two individuals were included, group I: 30 patients with symptomatic OLP, no histopathologic signs of dysplasia (19 females, 11 males, age 40–65 years), group II: 12 OLP cases with dysplasia (10 females, 2 males, age 45–65 years) and group III: ten control subjects with no oral disease. Biopsy specimen were taken from group I before and after steroid therapy (after ethical committee approval and patients' consents) and from surgical sites in control subjects. Whole unstimulated saliva was collected from all included subjects simultaneously to biopsy. TNF-alpha and INF-gamma levels were determined in tissue and salivary samples of groups I and III, using ELISA kits (R&D system, Mineapolis, USA). Salivary total soluble (s)CD44 was investigated in all groups, using an ELISA assay (Bender MedSystems, Vienna, Austria)

Results: Control group registered lowest values for studied markers, in tissues and saliva with highly significant difference from OLP patients. TNF-alpha and INF-gamma levels in OLP patients decreased significantly after steroid therapy, simultaneously in tissues and saliva, but were still higher than controls. Levels of salivary sCD44 were significantly higher in group II than groups I and III; with strong correlation between dysplastic changes in OLP lesions and salivary sCD44 levels above 20.4 ng/ml.

Conclusion: Salivary markers could be considered valuable, reliable, available, non invasive and cost effective diagnostic tools that can monitor severity, dysplastic changes and therapeutic progress in OLP.

Theme: Implantology: Oral Surgery

FC058
Minor Oral Surgery in Patients on Aspirin Therapy-To Stop the Medication or Not
Suhael Ahmed, Nafeesa Tabassum, Moath Al Qarni, Abdulaziz Al Alloush, Almohanned Al Swaiket, Meshaal Al Shammari
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Purpose: The aim of this study is to outweigh the risk over the benefits of Aspirin withdrawal in minor oral surgical procedures.

Materials and methods: One hundred and twenty-four patients in the age group of 40–55 who visited Riyadh college of Dentistry over a period of 1 year were included in the study. First group of 62 patients were on Aspirin therapy with a daily dose of 81 mg for at least a year and second group of 62 patients were healthy individuals not on Aspirin therapy. Aspirin was not discontinued for any patient. Minor surgical procedures including extractions, implant placement and alveoloplasty were performed on the patients and Bleeding assessed before and after the surgical procedure. The bleeding time was measured once before the surgical procedure. After the procedure, bleeding time was measured at an interval of 30 min, until bleeding stopped completely. All the patients were continuously monitored for next 6 h.

Results: Preoperative values were within normal limits for all patients. Intraoperative bleeding was within normal limit in most cases except two cases in group 1 and three cases in group 2 where bleeding lasted for more than 2 h, although bleeding was easily controlled in these patients by local measures.

Conclusion: We conclude that most minor oral surgery procedures can be carried out safely without stopping long-term aspirin regimen.

FC059
Oral Surgery in Inherited Bleeding Disorder Population: Effectiveness of Local Hemostasis
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Aim: This prospective study evaluated the effectiveness of surgical packs, suturing and antifibrinolytic treatment in preventing bleeding after oral surgery in patients with hemophilia, von Willebrand’s disease (VWD), or platelet disorders.
Methods: Oral surgery was made in patients with inherited bleeding disorder, under standardized local hemostasis involving surgical pack, suturing and passive mouthwash with 5% tranexamic acid solution. Substitutive treatment was used in patients with severe deficits. Tooth extractions were made under local anesthesia, no nerve trunk infiltration was made.

Results: Twenty-two patients underwent 63 dental procedures including 39 permanent teeth and eight deciduous ones and 16 scaling. One patient had secondary bleeding requiring surgical hemostasis and postoperative transfusion.

Conclusion: Local hemostatic measures including surgical pack, suturing and inexpensive tranexamic acid mouthwash was effective in minimizing the concentration and the volume of clotting factor concentrates while carrying safely oral surgery.

Free Communication Session 09 | B332 | 28.08.2013 | 14:00–15:00

Theme: Implantology: Implantology

FC060
Biomechanical Behavior of Dental Prosthesis
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1Department of Mechanical Engineering, Laboratory of Mechanical Physical of Materials (LMPM), University of Sidi Bel Abbes, Algeria, 2Department of Mechanical and Aerospace Engineering, and Center for Cardiovascular & Respiratory Sciences, West Virginia University, USA, 3Department of Mechanical and Industrial Engineering, Applied Science University, Amman, Jordan, 4Medical Engineering Research Group, Faculty of Science & Technology, Anglia Ruskin University, Chelmsford, Essex, UK

Aim: Dental prosthesis has been used and studied for the replacement of missing teeth for many years. The biomechanical behaviour of osseointegrated dental prostheses systems plays an important role in its functional longevity inside the bone. Simulation of these systems requires an accurate modelling of the prosthesis components, the jaw bone, the implant–bone interface, and the response of the system to different types of applied forces. The purpose of this study was to develop a new three-dimensional model of an osseointegrated molar dental prosthesis and to carry out finite element analysis to evaluate stress distributions in the bone and the dental prosthesis compounds under an occlusal load was applied to the top of the occlusal face of the prosthesis crown.

Materials and methods: The jaw bone model containing cortical bone and cancellous bone was constructed by using computer tomography scan pictures and computer aided design tools. The dental prosthesis compounds were constructed, simulating the commercially available cylindrical implant of 4.8 mm diameter and 10 mm length. Both finite element models were created in ABAQUS finite element software. All materials used in the models were considered to be isotropic, homogenous and linearly elastic. The elastic properties, loads and constraints used in the model were taken from published data.

Results: Results of our finite element analyses indicated that the maximum stresses were located around the implant neck, in the marginal bone.

Conclusions: Thus, this area should be preserved clinically in order to maintain the bone–implant interface structurally and functionally.

Objective: The aim of the study was to evaluate the effect of the dynamic forces on the implants with two different superstructure materials in “all on four” concept and alternative designs using 3-D finite element stress analysis.

Methods: Different treatment alternatives with different implant designs were performed in an edentulous mandible. In Design 1 and 2 implants were placed according to “all-on-four” concept; Design 3 and 4 two long (13 mm length, 4 mm diameter), two short (7 mm length, 4 mm diameter) implants; Design 5 and 6 four long, two short implants; Design 7 and 8 two long, four short implants were placed vertically. Superstructures were planned as acrylic and porcelain dentures. Totally 300 N load was applied. FEA is used to evaluate stress distribution. Dynamic loading was performed as assuming a person eating three meals a day and 60 chewing motion per minute for 15 min. It was also assumed that the teeth were in uniform temperature (36°C) at the beginning, and 60°C for hot, 15°C for cold drinks (beverages).

Results: Stresses on the implants leads to early failure in the acrylic than the porcelain for all designs. “All-on-four” concept is a long-lasting design for implant endurance when compared with the short implant treatment alternatives. Usage of long implants instead of short ones, and increasing the number of implants; ensures the bracing of the implants with greater cycles.

Conclusions: Usage of long implants rather than short ones, increasing the number of implants and porcelain superstructures elongates the implant’s lifespan.
Prosthetic Dentistry, College of Dentistry, The Ohio State University, Columbus, OH, USA

Aim: Passive fit of the frameworks has utmost importance for the long term success of implant restorations. Non-passive superstructures may lead to biologic and mechanical complications such as non-axial loads generated on implants, cervical bone loss, mobility and prosthetic component failures. A complete passive fit of screw-retained restorations is arguably impossible according to some clinicians, whereas, some think it can be achieved with precise application of the routine application of the fabrication procedures.

Case: This report describes an intra-oral luting technique to achieve passive fit of the metal framework of a fixed detachable implant-supported prosthesis. Clinical and laboratory procedures are presented step by step.

FC063

Accuracy Assessment of Computer Assisted Implant Planning and Placement
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Aim: To compare 2D CT alone with 2D + 3D reconstruction for pre-operative planning of implant placement.

Methods: Spiral CTs of 29 patients were used for both reformatted 2D and 3D computer assisted planning. The number, size and site of implants and the occurrence of anatomical complications during the planning and the implant placement were statistically compared using percentage agreement and the Kendall's correlation coefficients. In 16 patients the surgery was based on 2D imaging while in 13 patients it was based on 2D + 3D imaging.

Results: Agreement between planning and placement of the implants was highly significant for the implant site selected. For 2D based planning and placement, agreement reached 62%. For 2D + 3D based planning and placement, agreement attained 76%. For planning and placement of implant size based on 2D images, agreement was 35% while in 2D + 3D it was 46%. Agreement was not significant for anatomical complications, 73% for 2D and 76% for 2D + 3D planning.

Conclusions: The 3D planning system is undoubtedly a more reliable tool for pre-operative planning of implant dimensions and placement. It has a better diagnostic value than 2D based planning for implant length and axial placement in relation to the prosthetic tooth position. However, there are no significant differences in the 2D and 2D + 3D planning for anatomical complications. The 3D planning system definitely facilitates a significant increase in intra-operative safety, quality and also improves the predictability of treatment goal, especially during the insertion of implants in complex cases.

FC064

Clinical and Radiographic Evaluation of IDcam™ Dental Implants
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Objective: When a new implant is brought to market, prospective trials should be carried out to determine predictability of system. The aim of this study was to evaluate implant survival, crestal bone level changes and clinical parameters of IDcam™ dental implants over a mean follow-up period of 3 years.

Materials and methods: Seventy-two patients, 32 females and 40 males, received 256 implants. Implant-supported metal-ceramic fixed restorations were inserted. Following completion of restorations, each patient was reexamined at 6-month intervals. Standardized radiographs of implants were made and radiographic crestal bone level changes were calculated as well as soft tissue parameters included pocket probing depth (PPD), bleeding on probing (BoP), plaque index (PI), and gingival index (GI). Examinations were recorded from 18 to 42 months. Implant survival was estimated using Kaplan-Meier method. The associations between implant survival and recorded variables were estimated by using Cox proportional regression analysis.

Results: The Kaplan-Meier survival analysis demonstrated a cumulative survival rate of 97.7%. Three implants in three patients failed to osseointegrate at stage 2 surgery, and three implants in three patients were lost after loading. The mean marginal bone loss was 0.33 ± 0.14, 0.47 ± 0.15, and 0.58 ± 0.16 mm as determined 6, 12, and 24 months after prosthetic loading, respectively. Cox proportional regression analysis revealed that the variables of age, gender, type of the restoration, and implant region had no significant influence on implant failure (p > 0.05). Coefficients of correlation between implant survival and crestal bone loss, PPD, BoP, PI, GI were found nonsignificant (p > 0.05).

Free Communication Session 10 | B342 | 28.08.2013 | 14:00–15:00

Theme: Implantology: Oral Surgery

FC065

Eruption with Axis’s Adjustment of a Cyst-Associated Mandibular Premolar
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Aim: Marsupialization is the most minimal intervention used for the treatment of odontogenic jaw cyst and may induce eruption of impacted teeth associated with denterogenic cystic lesion. Therefore marsupialization has been widely recommended, particularly for a
large cystic lesion, to avoid loss of teeth, bony defects in the jaw and neurovascular injury as a result of enucleation.

The purpose of this report is to describe the successful outcome of conservative surgical management of a large dentigerous cyst associated with an impacted mandibular second premolar in a young patient.

Clinical presentation: An 11-year-old girl was referred to the oral medicine oral surgery department of the university dental clinic of Monastir complaining from a painless buccal swelling in the right posterior mandible. The panoramic radiograph shows a well-defined radiolucent unilocular lesion located in the periapical area of the right second temporary mandibular molar which is endodontically treated. The computed tomography scan shows that the right second mandibular premolar is deeply impacted in a horizontal position the way that the root apex perforates the lingual cortex.

Treatment: The second right temporary mandibular molar was extracted then an incisional biopsy was performed associated with cystic decompression and suture of the pathologic tissue with the healthy mucosa. An arch was provided for space maintenance. The diagnosis of dentigerous cyst was approved by histological examination

Follow-up: During 15 months follow-up period, the cystic cavity has progressively shrunk and the impacted premolar has spontaneously erupted.

FC066
Genetic Implication in Supernumerary Teeth-Surgical Approach
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Introduction: Hiperdontia is the anomaly in the number of teeth-increased the number of teeth (supernumerary teeth), which presents a challenge to the oral surgeon, pedodontion, and orthodontist, in order to establish the adequate occlusion, rehabilitation and to achieve function and aesthetic.

Case: Three children of the same family aged, 10, 11, 13 years, came at the CUSCK in Clinic of Pedodontics because of the presence of milk teeth in upper jaw in frontal region. After clinical examination, panoramix-RTG-in in all of three patients we found to be present the impacted permanent teeth, supernumerary teeth in frontal region of both jaws, and the evident persistation of milk teeth. After dental treatment of decayed tooth’s in the Clinic of Pedodontics and extraction of persistent milk teeth, surgical treatment is continued in the Oral Surgery of CUSCK where the supernumerary teeth are removed and at the same procedure the permanent teeth of the frontal area are denuded. Patients are constantly called to examinations after surgical intervention and what we initially noticed are the first signs of eruptions of lateral incisives at all the patients, while the central incisives remained un-erupted. The patients then underwent second intervention in order to perform the orthodontic withdrawal of the central incisives. Follow up is presented with RTG and photos taken during the treatments.

Conclusion: For proper treatment of this anomaly is necessary to establish close cooperation in between Pedodontist, Oral surgeon and Orthodontist. Based on our results this multidisciplinary approach gives visible results.

FC067
Heart Rate Control in Oral Surgery Hypertensive Patients: Music Strategy
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Objective: To verify the effect of music on main vital signals, on immediate postoperative pain level and analgesic consumption in hypertensive patients undergoing minor oral surgery.

Methods: A prospective random control trial was held from February 2011 to November 2012 in the Oral Surgery Clinic of University of São Paulo. Fifty-seven patients attended inclusion criteria and were distributed in Group C when blood pressure was ≤ 120:80 mmHg and in Group H when mean blood pressure was ≥ 120:80 mmHg with diagnose and under medication for hypertension. Patients were then randomly allocated into subgroups: “Cm” (n = 30) when individuals underwent music intervention during 20’ pre-anesthesia, during dental extraction and 20’ after surgery ending and “Sm” (n = 27) where patients underwent the same procedures without music intervention. Blood pressure, heart rate and oxygen saturation were measured at the immediate preoperatively, pre-anesthesia, perioperative and postoperative periods. VAS scales and analgesic consumption diary accessed postoperative pain.

Results: There was significant decrease at heart rate especially in Group H after 20 min postoperative (p = 0.002). An expressive difference at “Cm” subgroup (p < 0.001) comparatively to “Sm” subgroup (p = 0.016) regarding heart rate. There were no differences between blood pressure variations among subgroups. Limited sample did not allow concluding that music positively interferes with immediate postoperative pain control.

Conclusion: Listening to music is an alternative method to control the physiological response to minor oral surgery stress specially in hypertensive patients.

FC068
Is Lingual Injection Necessary in Mandibular Anterior Tooth Extraction?
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Background: Infiltration anesthesia is the most commonly used technique as a local anesthetic injection of mandibular anterior
region during the restorative and surgical procedures. Despite of some dentists who use both buccal and lingual infiltrations in mandibular anterior and premolar tooth extractions, the others prefer only buccal infiltration. The aim of our study was to investigate if lingual injection is necessary in extraction of mandibular incisor and premolar teeth.

**Materials and methods:** Forty-four healthy patients who admitted to our clinic for dental extractions with various reasons were included in the study. Patients were divided into two groups. In the experimental group buccal infiltration only used 1.5 ml of 2% lidocain hydrochloride with 1/80,000 epinephrine administered to the buccal side. In the control group 1.5 ml lidocain hydrochloride (2%, 1/80,000) was injected to the buccal side and then 0.3 ml injected to the lingual side. Each patient asked to record the pain and discomfort degree that felt immediately after the injection according to Face Pain Scale (FPS) and Visual Analogue Scale (VAS). After 5 min, the teeth were extracted and same scales recorded by the patients.

**Results:** According to VAS and FPS scores, there was no statistically significant difference (p > 0.05) between mandibular anterior tooth removal with or without lingual injection.

**Conclusion:** Extraction of mandibular incisor and premolar teeth without lingual injection is possible by depositing buccal infiltration of 1.5 ml of 2% lidocaine HCl.

**FCO69**

**Large Odontogenic Cystic Lesions with Ectopic Impacted Teeth: Case Reports**

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**Aim:** Cystic and cystlike lesions of the maxilla and mandible are primarily ellipsoid, radiolucent, and clearly demarcated and may be odontogenic or nonodontogenic. Odontogenic cysts and tumors develop during or after the formation of teeth. Most odontogenic lesions are benign, but some may exhibit aggressive and destructive behavior locally. In this case report will be presented some cases like dentigerous cysts, keratocysts and an unicystic ameloblastoma with ectopic impacted teeth and their wide variety treatment options from minimal invasive to more aggressive.

**Cases:** We describe six cases, who referred to our Oral and Maxillofacial Surgery clinic of Istanbul University Faculty of Dentistry between years 2009 and 2010 with some complaints like facial asymmetry and absence of teeth. The patient age ranged from 18 to 34 years, with sex distribution of one female and five males. According to radiological examinations large cystic lesions and ectopic impacted teeth were diagnosed.

Four dentigerous cysts, one keratocyst and one unicystic ameloblastoma were diagnosed after histological examination. Five of these lesions were located in mandibular ramus region, one were located in maxillary tuber area. Three years follow up after surgery was made and postoperative healing were satisfactory.

**Conclusions:** It is important by selecting the treatment protocol. It is often difficult to distinguish cystic-appearing lesions from one another with radiography. Careful consideration of the patient history and the location of the lesion within the mandible, its borders, its internal architecture, and its effects on adjacent structures generally makes it possible to narrow the differential diagnosis.
Background: Genetic polymorphisms in the interleukin 6 (IL6) gene have been reported to influence the host response to microbial challenge in periodontitis by altering levels of cytokine expression. The aim of this study was to evaluate two nucleotide polymorphisms at positions -174 (C>G) and nt565 (A>G) of IL-6 gene and their association with generalized chronic moderate and severe periodontitis.

Material and methods: The study population consisted of 299 healthy unrelated individuals and 111 patients with periodontal disease divided into two groups according to the loss of attachment (moderate periodontitis with clinical attachment loss (CAL) ≤4 mm and severe periodontitis with CAL > 4 mm). They have filled in and signed informative permission for genetic research and storage of isolated DNA in the Macedonian Human DNA Bank (hDNAMKD). Cytokine genotyping was performed by PCR-SSP (Heidelberg kit). The population genetics analysis package (PyPop) was used for analysis of the cytokine data for this report. Comparisons of different alleles, genotypes, haplotypes, and haplotype zygosity for two groups were tested by Pearson’s p-value.

Results: Within the moderate clinical phase of periodontal disease significant associations (p < 0.05) were detected between subjects with periodontitis and cytokine genotypes IL6 -174/C; IL6 -nt565/A:A and cytokine haplotype zygoates IL-6/CA:CA.

Within the severe clinical phase of periodontal disease significant associations (p < 0.05) were detected between subjects with periodontitis and cytokine genotypes IL6 -174/C; IL6 -nt565/ A:A, cytokine haplotype IL-6/CA and cytokine haplotype zygoates IL-6/CA:CA.

Conclusion: Cytokine polymorphism on the IL-6 gene appears to be associated with susceptibility to chronic periodontitis in Macedonians.

Aim: The aim of this study was investigate whether an association exists between baseline radiographic defect angle and treatment in periodontal regenerative surgery.

Materials and methods: The study was realized on 30 patients who had pair test sites and control sites, with pockets ≥6 mm and infra-osseous defects with depth ≥3 mm measured by probing and X-ray evaluation radiographic defect angle was ≤22° than when it was ≥23°.

Results: The average values of the clinical attachment level (CAL) in the test sites were 1.8 mm at 6 months and 2.1 mm after 12 months, for the group with EMDGAIN®, 1.1 mm at 6 months and 1.2 mm at 12 months for the control group. The radiographic gain was ascertained after 12 months.

Conclusions: This study showed that there was a significant association between baseline radiographic defect angle and CAL gain of ≥4 mm after regenerative surgery with EMD is used in narrow (≤22°) intrabony defects suggests that the baseline radiographic defect angle might be used as a prognostic indicators of treatment outcome.
Systemic Correlates of TMJ Neuro-Inflammation

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Purpose: This research sought to identify systemic co-morbid conditions associated with temporomandibular joint disorders (TMJD). We present clinical observations that link TMJD to a variety of neurological disorders. We hypothesized that mechanical realignment between the maxilla and the mandible with oral orthotics can be successful in rapidly suppressing certain debilitating neurological and neuropsychiatric symptoms, including the movement disorders characteristic of Tourette’s Syndrome, cervical dystonia, blepharospasm, and Parkinson’s Disease.

Method: We examined patients with TMJD, as well as patients with a variety of neurologic conditions for possible TMJD. Diagnostic criteria included were jaw joint clicking or popping, jaw pain, headaches, migraines, neck and shoulder pain or tightness, limited jaw opening, and accidents or trauma to the head and neck. We confirmed the clinical diagnosis by means of MRI’s, CT scans, Tomography.

Result: In 35% of patients with neurologic pathologies, calibrated oral orthotics were successful in reducing TMJ-associated symptoms, in re-aligning the position of the mandible, and in reducing the dystonic behaviors.

Conclusion: Our research suggests that up to one third of the patients with systemic disorders associated with TMJ may suffer from peripheral neuro-inflammation of the mandibular nerve. Our findings implicate particularly the auriculotemporal branch of the trigeminal V3, which runs proximal to the TMJ. We also established that a substantial proportion of patients with neurological pathologies, the neurologic symptoms appear to be definitely linked to TMJD.

In the remaining patients, the clinically observable neurological pathologies are clearly not systemic correlates of TMJ neuro-inflammatory processes.

FC076
The Effect of Ceramic Thickness and Number of Firings on the Color of Densely and Partially Sintered Zirconia Ceramic Systems
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Purpose: Milling of zirconia blocks can be performed in the partially or fully sintered stage. Their high crystalline content makes zirconia ceramics relatively more opaque to visible light. The purpose of this study was to evaluate the effects of number of firings and veneering ceramic thickness on the color of partially sintered (Cercon) and fully sintered (DC Zirkon) zirconia cores.

Materials and methods: Thirty disc-shaped specimens, 4 mm in diameter with a 1-mm core thickness, and 0.5-, 1-, or 1.5-mm dentin ceramic thicknesses, were made from each of two ceramic systems (n = 10). Repeated firings (3, 5, 7, or 9) were performed, and the color of the specimens was compared with the color after the initial firing.

Results: L*a*b* values of the ceramic systems were affected by the number of firings (p < 0.01), ceramic composition (Cercon or DC Zirkon) (p < 0.01), and ceramic thickness (p < 0.01) except the a* value (p = 0.07). As the ceramic thickness increased, significant reductions in L* values (p < 0.01) were recorded for DC Zirkon specimens resulting in darker specimens, increased ceramic thicknesses has led to increased L* values for the Cercon specimens subjected to 3 and 5 number of firings which became lighter. An rise in the number of firings has led to increased L* values for both ceramic systems resulting in lighter specimens (p < 0.01).
Cercon specimens were darker, more reddish and yellowish compared to the DC Zirkon specimens for every thickness and number of firings levels except the specimens with ceramic thicknesses of 0.5 and 1 mm less yellowish than the DC Zirkon specimens ($p < 0.01$).

FC077
Comparative Analyse of Variables of Metal Ceramic Dental Bridges
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**Aim:** Our aim in this study is to:
1. Analyze the odontometric values of pontic elements of occluso-cervical, mesio-distal and vestibulo-oral dimensions:
2. Compare the getting values with homologous values of natural teeth.
3. Determine the difference in per cent of values from our study with values of control group.

**Material and methods:** During 2010 and 2011 year, clinically were analysed and measured 455 pontic elements of lateral dental bridges by 151 treated patients from both sex, and in age from 26 to 70 years old.

Measurement was made with an instrument for precise measuring (shubler), with precision of 0.1 mm.

Like control group were used results from measurement of natural teeth according authors: Lavelle, Lenhossek, Sicher-Tandler and De Yonge-Cohen, realised with same measured precision of variables from 0.1 mm.

The statistically significance of results from our study is showed with T-test ($t = 6.75$), and coefficient of probability ($p < 0.01$).

**Results:** The getting results showed that:
- Pontic elements in our study are in average for:
  - 23.49% highest than control group
  - 16.13% shorter than control group and
  - 8.82% narrower than control group teeth.

**Conclusions:** Like conclusion we can say that:
1. The highest of pontic elements of dental bridge increase the resistance and the hardness of bridge with geometric progress.
2. The shorter pontic elements in mesio-distal dimension will influence on defence of dental bridge from deformity and breaking.
3. The narrower pontic elements will increase the hardness of dental bridge in linear manner.

FC078
The Impact of Complete Dentures on Oral Health Related Quality of Life
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Oral health related quality of life (OHRQoL) is considered to be an important part of patient’s general health. Therefore, the main goal of contemporary dentistry is not only to improve oral health but also to improve overall quality of patients life.

**Objectives:** The aim of this study was to assess the OHRQoL before and after prosthodontic complete denture therapy and denture satisfaction of patients.

**Material and methods:** The study included 97 patients with complete denture (CD) There were 51 females and 46 males between the ages 40–80 years. These patients were selected from the waiting list for CD in University Dentistry Clinical Center, Prishtina, Kosova. The data was collected from survey questionnaires OHIP-49 more sophisticated, accepted and translated into more than 20 languages in world. All patients with CD filled in Albanian version of the questionnaire (OHIP-49) twice: the first time before the therapy had begun and the second time 6 months after the new CDs had been delivered.

**Result:** OHRQoL before and after 6 months was statistically significantly by the insertion of new CDs in all prosthodontic patients ($p < 0.0001$) with Mann-Whitney test. Patients are more satisfied with upper jaw CDs than in lower jaw.

**Conclusions:** Elimination of oral pain and problems associated with chewing and speech and improving patient’s aesthetics increase the quality of life Clinicians should also recognize the important role they play in improving a patient’s quality of life aside from just manufacturing a complete denture for.

FC079
Treatment Management in Cases with Bruxism
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**Aim:** The primary objective of this paper is exhibiting a case presentation involving treatment management of patients with bruxism in which depending on the severity of the symptoms we fabricate various types of splints, suggest myofunctional exercises, yoga, use of vitamins, minerals and occasionally sedatives.

**Materials and methods:** We treated 40 patients, divided into four groups of 10. The first group manifested permanent afflictions, jaw pain, myalgia and persistent headaches. The second was comprised of patients with evidently present attrition on the dentition. The third group patients complained about TMJ pain and clicking sounds during jaw opening and closure. The severity of the bruxism in the third group caused clinically manifested stadium of periodontitis. The treatment protocol aimed to influence the impelled effectors. For the first group, we fabricated stabilization splints. For the second we used soft splints. The third was treated with restrictive splints and the fourth with partial splints for selective decompression. Simultaneously we examined the psychological component of the disorder by the use of a placebo.

**Results:** We documented the progress of the treatment after 6, 12 and 18 months from the beginning of treatment. The placebo
showed us that the psychological element was insignificant and the symptoms had organic origin. After the 18th month, the rehabilitation was evident in the fourth group. In the second and third group, the symptoms were eliminated after 12 months and in the first only after 6 months.

**Conclusions:** The conclusion guided us toward the comprehension that our bruxism treatment management is effective and without resurgence.
Results: Two hundred and three senior secondary school students whose ages were 14–19 years participated in the study. Prevalence of current cigarette smoking was 2% and all smokers were males.

There was no statistically significant differences in terms of age (p = 0.139), gender (p = 0.053) and weight gain concerns. However there was a significant difference in terms of smoking status with significantly higher proportion of smokers believing that smoking helps to gain weight while non smokers believe it helps to lose weight (p = 0.000).

Conclusion: Results highlight potentially important differences in the relationship between weight concerns and smoking status and the influence these concerns may have on smoking uptake. The relationship between smoking and weight concerns among the population studied is different from previously reported studies.

FC083

Greek Dentists’ Work-Related Stress During the Economic Crisis

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Aim: Greek National Health System dentists suffer from work stress because of wage cuts and job insecurity due to the economic crisis and consequent health policies. The aim of this study was to investigate chronic work stress of dentists working in public sector’s primary healthcare by using the Effort-Reward Imbalance (ERI) questionnaire, which was used for the first time among Greek dentists.

Materials and methods: All 192 dentists working in Greek public health centers were invited to participate; 135 (70.3%) agreed. Of them, 68 (50.4%) were male (age 55.3 ± 6.6 years) and 67 (49.6%) were female (age 54.3 ± 4.5 years). The translated, adapted and validated into Greek version of the ERI, a 23-item instrument using a simplified, uniform 4-point Likert response scale, was delivered between July and October 2012, with permission of the Ministry of Health.

Results: Factor analysis revealed three main profiles characterizing dentists’ responses: (i) one pattern, combining intense time stress, physical fatigue, anxiety and feelings of decreased esteem and respect by others, (ii) one comprising by time stress, physical fatigue, work insecurity and instability and (iii) one exhibiting intense daily work stress. ER ratio >1 was found in 60.18% of dentists, while 13.56% had overcommitment score in the upper tertile.

Conclusions: A relative imbalance between efforts dedicated and rewards perceived was found in primary care Greek dentists at the specific timing. Therefore, appropriate interventions should be implemented to monitor and address work-related stress, which is expected to increase in the era of crisis.
Results: There were statistically significant differences between the ZnOE and IH groups (p < 0.05). The effect of IVS on bonding strength was found to be statistically significant (p < 0.05).

Conclusions: In clinical application, taking set impression material away from the mouth can cause negative effects such as distortion of impression material, surface changes, tearing, and detaching impression from impression tray. The main advantage of this new technique is that dentists can take the impression tray away from the mouth with minimal force. Consequently, the dimensional stability and structural integrity of the impression will be protected.

FC086

A New Technique for Controlling the Patient Using RFID Card
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Introduction: Marking or labelling the dentures is not a new concept in either prosthetic or forensic dentistry, and its routine practice has been urged by forensic dentists internationally for many years. Denture identification is especially important for patients in geriatric institutions. For the patient who may have difficulty learning to control new dentures it is possible to lose the dentures. Over the years, various methods of denture marking have been reported in the literature. These include surface marking and inclusion techniques using metal or nonmetal materials, microlabels, and chips. Automatic identification using barcodes incorporated into dentures has been developed. However, the scanning of barcodes may be difficult due to the opacity of the acrylic resin, and for this reason the use of clear acrylic resin is recommended with this system. Furthermore, the curvature of the denture may cause distortion of the barcode, making it unreadable. Also, barcode technology may present practical obstacles for denture prostheses. In medicine, radiofrequency identification (RFID) is used to reduce the errors of patient identification, particularly during blood transfusion and drug administration in hospitals. It seems reasonable to adopt this technology for denture identification. It is possible to help blind patients using a similar technology. Patients can be warned or informed with the system that placed in the living area.

Results: In this study we inserted a RFID chip in to removable prosthesis using a simple method. It helps the patients family following and controlling the patient when the he is alone.

FC087

Study of the Radius of the Monson’s Sphere in Iranian Adults
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Aims: One of the required information in rehabilitating the occlusal plane in dentistry is the radius of Monson’s sphere, which like other anatomical indices varies in different races. The purpose of this study is to determine the radius of this sphere in the students of dental school as a sample of Iranian race.

Materials and Methods: Forty-five Iranian subjects (19 males and 26 females) aged 18–25 years old were selected for this study. The x, y, z coordinates of cusp tips of all mandibular teeth except for the third molars obtained with a three-dimensional digitizer, were used to derive a spherical model of the occlusal surfaces’ curvature. From the best interpolating sphere, the radi of the Monson’s sphere, the left and right curves of Spee (quasi-sagittal plan), the canine and molar curves of Wilson (frontal plane) and also the depth of curve of Spee were computed. Statistical analysis of the data was performed by student’s t-test.

Results: Although all of the computed variables were greater in men, the occlusal curvature of mandibular arch was not influenced by gender. The mean radius of the Monson’s sphere was 111.5 mm (121 mm in men and 104 mm in women which was closer than men to the classical value of 4 inch, confirming Monson’s observations). The radi of the left and right curves of Spee, and the curve of Wilson in canine area were about 119 mm in men and 102 mm in women. The depth of the curve of Spee was 2/04 mm in men and 1/17 mm in women without any gender differences.

Conclusions: The average radius of the Monson sphere in this study was greater than the classic value of 4 inch.

FC088

Residual Ridge Morphology in African American vs. Caucasian Women, and Clinical Management
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Osteoporosis is a risk factor for residual ridge resorption in post menopausal women. African American women have high bone mass and less severe osteoporosis than caucasian women. But its implication on residual ridge morphology in AA is not clearly defined much in research.

Objective: Morphology of both type women was evaluated.

Method: BMI, ridge shape presence or absence of undercut in both arches was studied. Panoram Inde Benson) and Mandibular Cortical Index (Klementti et al) was used for calculation

Results and conclusions: Clinical and morphometric assessment reveal greater RR volume and increased occurrence of heavier, bulbous ridges in African American women. These findings are consistent with high bone mass reported in African American Women.

Clinical management: The presentation will present management of clinical cases, how to render treatment prosthesis in such patients.

FC089

An Investigation into the Effect of Different Preparation Designs and Try-in Pastes, on the Overall Color of Ceramic Laminate Veneer Restorations
Burçin Vanlıoğlu, Büket Evren, Erhan Tuğcu, Yasemin Kulak Ozkan
Nasoalveolar molding for Infants with Complete Unilateral Cleft Lip and Palate
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Background and aim: In the 19th century McNeil (prosthodontist) used an oral prosthesis to approximate the cleft alveolar segments and thus initiating the concept of modern surgical infant orthopedics. More recently (1994) Barry Grayson developed a new technique that not only it approximates the alveolar segments but it also reshapes the nose in order to perform primary nose surgery, consequently with better aesthetic outcome.

Materials and methods: Patients with nonsyndromic complete unilateral cleft lip and palate. Nasoalveolar molding was performed for each patient and treatment time took 8–12 weeks. A serial of standard basilar view 1:1 photographs were taken for each patient (same digital camera). Each patient was photographed at the initial visit and after the nasoalveolar molding.

Results: Patients expressed good improvement. The cleft size was reduced significantly, improved both the columnella deviation and length as well as the nostril width and height in the cleft side.

Conclusion: NAM is an effective procedure in reducing the alveolar cleft size and it also improves the nasal architecture. This will facilitate the work of the plastic surgeon during the lip adhesion and primary nose surgery and consequently with better aesthetic outcome.

A Comparative Evaluation of Active Vertical Protraction Appliance (AVPA) and Reverse Headgear: A Randomized Comparative Clinical Trial
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Aim: The aim of this randomized comparative clinical trial is to evaluate the skeletal and dentoalveolar effects of Active Vertical Protraction Appliance (AVPA) in comparison with Reverse Headgear (RH). AVPA is recently developed to prevent the undesired side effects of conventional protraction therapy and for providing simultaneous openbite and Class III treatment in patients with increased or optimum vertical dimensions.

Materials and methods: The inclusion criteria for the AVPA (30 patients, average age: 10.19 years) group were the presence of maxillary deficiency caused skeletal Class III, increased or normal vertical dimensions and being at the pubertal growth spur or at earlier growth periods. RH group consisted randomly selected 30 patients (average age: 10.81 years) from archive records. Inter- and intragroup differences were analyzed with independent and paired samples t-tests.

Results: As a result of AVPA treatment major Class III correction was achieved in all patients. Palatal plane inclination remained stable in AVPA group whereas it decreased significantly in RH group. Gonial, ramal and mandibular plane angles decreased significantly in AVPA group, however, significant increase was observed in RH group. Upper maxillary incisor extrusion and protrusion were recorded in both groups and as for the lower incisors, protrusion was recorded in AVPA group whereas retraction was recorded in RH group.

Conclusions: With the use of AVPA treatment, vertical control was successfully achieved during protraction while preventing the maxillary and mandibular side effects of the conventional protraction treatment. The use of skeletal anchorage with AVPA can be considered in further studies for the prevention of dentoalveolar side effects.

A Comparison of Two Different Digital Model Analysis Programs
Ruhi Nailacı1, Burcu Aydin2, Ali Altuğ Bıçakçı1, Hikmet Orhan3
1Department of Orthodontics, Suleyman Demirel University, Isparta, Turkey, 2Department of Orthodontics, Gaziosmanpasa University, Tokat, Turkey, 3Department of Biostatistics and Medical Informations, Suleyman Demirel University, Isparta, Turkey

Digital caliper was used to measure the cleft size on the study model at the initial visit and after nasoalveolar molding.

Results: Patients expressed good improvement. The cleft size was reduced significantly, improved both the columnella deviation and length as well as the nostril width and height in the cleft side.

Conclusion: NAM is an effective procedure in reducing the alveolar cleft size and it also improves the nasal architecture. This will facilitate the work of the plastic surgeon during the lip adhesion and primary nose surgery and consequently with better aesthetic outcome.
**Aim:** With regard to innovations in computer technology and systems, three-dimensional dental models have been a good alternative for conventional casts. In the literature there are some researches that surveys the accuracy and reproducibility of the measurements comparing digital and conventional dental casts, however there is not any study that compares different three-dimensional model analysis softwares. The purpose of the current study was to evaluate and compare reliability of measurements performed by two different three-dimensional digital orthodontic model analysis programs.

**Material and methods:** From the archive of our faculty 20 dental casts were selected and scanned in STL format with an Orthodontic 3D Scanner (3 shape R700, Copenhagen, Denmark). For orthodontic analyses we used Orthomodel (v.1.01, Orthomodel Inc., Istanbul, Turkey) and O3DM (v.3.4, O3DM Thunoeqade, Aarhus C, Denmark) software programs. With both programs one examiner performed Bolton and space need analyses, tooth widths, arch lengths, intermolar and intercanine measurements. For intra-examiner reproducibility, 1 week after assessment, ten randomize-selected dental casts were re-measured by the same observer. Paired-samples test was used to determine the differences between the groups and Cronbach’s alpha analysis was applied for intra-examiner reproducibility.

**Results:** Orthomodel and O3DM programs showed no significant differences in the measurements that are crucial for treatment planning (p > 0.05). Also Cronbach’s alpha value was very close to the ideal value of 1 (α = 0.905), which shows good intra-examiner reliability for all measurements.

**Conclusions:** The results of our study suggest that both of the programs are clinically acceptable for orthodontic measurements with respectable reliability.

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**FC093**

**Antibacterial Effects of Six Orthodontic Bonding Materials**

Zeliha Muge Baka1, Ayce Unverdi Eldeniz2

Mehmet Burak Gunser2, Faruk Ayhan Basciftci1

1Department of Orthodontics, Selcuk University, Konya, Turkey
2Department of Endodontics, Selcuk University, Konya, Turkey

**Objective:** Long-lasting antibacterial effects of orthodontic bonding materials may be beneficial in the prevention of white spot lesions. The aim of this study was to evaluate antibacterial effects of six orthodontic bonding materials which are commonly used in orthodontics.

**Materials and methods:** The antibacterial effects of six orthodontic adhesives were evaluated against Streptococcus mutans and Streptococcus salivarius by direct contact test (DCT). With DCT, quintet specimens of Transbond XT, Blo Gloo, Gren Gloo, Opal, Light Bond and Clearfil AP-X were placed at the bottom of the wells at a height of 2 mm in 96-microtiter plate. Two sets of test materials were prepared: 1- and 7-days samples. Ten microliters of bacterial suspension was added to each well for direct contact with each material for 1 h at 37°C. Bacterial growth was then measured using a microplate spectrophotometer hourly for 24 h (OD492 = 0.6). Five uncoated wells using identical inoculum size served as positive controls. Another five uncoated wells with media served as negative controls. The data obtained at the end of 24 h was statistically analyzed with one-way ANOVA and post hoc comparisons were done using Tamhane’s T2 test.

**Results:** Although statistically it was not significant, Blo Gloe generally showed greater antibacterial activity than the other materials. Transbond XT usually showed the least antibacterial activity. There was a statistically significant difference between Transbond XT and Light Bond in 1 day sample against S. mutans. No statistical significant differences were found among the other groups (p > 0.05).

**Conclusions:** Blo gloo possessed the most potent antibacterial activity.

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**FC094**

**Surgical Assisted Rapid Maxillary Expansion-Case Report**

Mergime Prekazi Loxha1, Albena Reshitaj2, Florije Asllani3, Osman Sejfija1, Fellanza Gjinolli1, Sami Salihu1, Zana Agani1, Aida Rexhepi2, Vjosa Hamiri4

1Department of Maxillofacial Surgery, Clinical University Center of Kosova, Pristitina, 2Department of Orthodontics, Clinical Dentistry University Center of Kosova, Pristitina, 3Department of Prosthetic Dentistry, Clinical Dentistry University Center of Kosova, Pristitina, 4Department of Oral Surgery, Clinical Dentistry University Center of Kosova, Pristitina

**Aim:** With regard to innovations in computer technology and systems, three-dimensional dental models have been a good alternative for conventional casts. In the literature there are some researches that surveys the accuracy and reproducibility of the measurements comparing digital and conventional dental casts, however there is not any study that compares different three-dimensional model analysis softwares. The purpose of the current study was to evaluate and compare reliability of measurements performed by two different three-dimensional digital orthodontic model analysis programs.

**Material and methods:** From the archive of our faculty 20 dental casts were selected and scanned in STL format with an Orthodontic 3D Scanner (3 shape R700, Copenhagen, Denmark). For orthodontic analyses we used Orthomodel (v.1.01, Orthomodel Inc., Istanbul, Turkey) and O3DM (v.3.4, O3DM Thunoeqade, Aarhus C, Denmark) software programs. With both programs one examiner performed Bolton and space need analyses, tooth widths, arch lengths, intermolar and intercanine measurements. For intra-examiner reproducibility, 1 week after assessment, ten randomize-selected dental casts were re-measured by the same observer. Paired-samples test was used to determine the differences between the groups and Cronbach’s alpha analysis was applied for intra-examiner reproducibility.

**Results:** Orthomodel and O3DM programs showed no significant differences in the measurements that are crucial for treatment planning (p > 0.05). Also Cronbach’s alpha value was very close to the ideal value of 1 (α = 0.905), which shows good intra-examiner reliability for all measurements.

**Conclusions:** The results of our study suggest that both of the programs are clinically acceptable for orthodontic measurements with respectable reliability.
Both the groups were divided into three subgroups on the basis of main groups, depending on the presence or absence of irradiation. Freshly extracted human maxillary anterior teeth were selected and decoronated before being randomly divided into two groups. The purpose of this in-vitro study was to compare cleaning effectiveness of irrigation activation protocols on smear layer and debris removal.

**Aim:** It is a known fact that radiotherapy, an important treatment modality for cancer patients, affects dental hard tissues at the same time. However, the effect of radiotherapy on the sealing ability of root canal obturating materials is not yet established. This in-vitro SEM study was carried out with the aim to assess the influence of radiotherapy on the sealing ability of three different obturating materials.

**Method:** Freshly extracted human maxillary anterior teeth were selected and decoronated before being randomly divided into two main groups, depending on the presence or absence of irradiation. Both the groups were divided into three subgroups on the basis of.

**Results:** In all the specimens receiving radiotherapy, mean marginal gap width was slightly higher when compared to those without irradiation, but was not statistically significant, except in case of the obturating material Resilon.

**Conclusion:** Radiotherapy significantly effects the sealing ability of obturating materials used (REAL-SEAL, BEEFILL21N1, GUTTA PERCHA without sealer). For the groups that received irradiation, a dose of 60 gray was delivered in fractions of 1.8 Gray per day, 5 days a week for 7 weeks. The specimens were then analyzed by SEM for marginal gap width and the images obtained were recorded and evaluated using Orion 6.604 software. All analyses were performed on Statistica software using Tukey’s post hoc test.

**Effect of Radiotherapy on the Sealing Ability of Obturating Materials**

Aseem Prakash Tikku, Monika Khangwal
King George’s Medical University, Lucknow, India

**Aim:** The aim of this survey was to illustrate statistical information about endodontic research published in PubMed index journals from the different universities of Turkey.

**Materials and methods:** A PubMed search was performed to retrieve the endodontic publications of authors affiliated to different universities of Turkey. Abstracts were reviewed and unrelated articles were omitted. Citation of each article was obtained from Web of Science. Data were extracted and transferred to Microsoft excel to determine the related scintometric indicators.

**Results:** A total of 1044 papers were found according to the defined criteria which shows considerable increase from one paper in 1953 to 103 in 2012. 79.31% of the articles printed in journals that presented in Science Citation Index expanded dental journal’s list. Most of the articles printed in Journal of Endodontics (17.59%), followed by Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontontology (11.47%). Most of the endodontic articles originated from the Ege University (15, 82%). Majority of endodontic articles (31%) were written by four Turkish authors. Thirteen percent of the articles were written by authors from different Turkish universities and only 9% of the papers were written with foreign researchers from different countries. The most cited Turkish article was written in 1995 and cited 100 times until December 2012.

**Conclusion:** Endodontic publication from different universities in Turkey has considerably increased, showing that research is becoming more important.

**Effect of Zoledronate Therapy on Bone Loss in Experimental Periapical Lesions in Rats**

Manuel Marques Ferreira, Ana Margarida Abrantes, Hugo Diogo Ferreira, Sir Vinceite Paulo, Lina Carvalho, Eunice Virginia Carrilho, Maria Filomena Botelho
Faculty of Medicine, University of Coimbra, Coimbra, Portugal

**Aim:** Osteonecrosis of the jaw is associated with bisphosphonates use in patients treated with intravenous doses for the prevention of bony metastases. The aim of the research was to evaluate the impact of zoledronate (ZOL) therapy on bone loss resulting from experimental periapical lesions in rats, using gamma camera to quantify the radioactivity of 99mTc-HMDP.

**Methodology:** After three doses of Zol injected subcutaneous weekly (0.07 mg/kg), in wistar rats, periapical lesions were induced in the first lower left molar. After 2, and 4 weeks the animals were euthanized. Before euthanized the animals were injected with 30–40 MBq of 99mTc-hydroxymethylene diphosphonate (99mTc-HMDP) and performed a scintigraphic acquisition 3 h later. After euthanized, the mandible was removed and radiopharmaceutical uptake was calculated. The absorption of the radio pharmaceutical was evaluated and analyzed using the Mann-Whitney test (p = 0.05).

**Results:** The results showed no statistically significant difference found in the absorption of the 99mTc-HMDP, between the groups.

**Conclusions:** This study demonstrated that there was no difference between the two groups in terms of the bone periapical destruction in rats taking Zol. Besides that it is possible to conclude that 99mTc-HMDP is a reliable method to assess the apical periodontitis.

**Effect of Radiotherapy on the Sealing Ability of Obturating Materials**

Emel Uzunoglu, Melahat Gorduysus
Department of Endodontics, Faculty of Dentistry, Hacettepe University, Ankara, Turkey

**Aim:** The purpose of this in-vitro study was to compare cleaning effectiveness of irrigation activation protocols on smear layer and debris removal.

**Conclusion:** Radiotherapy significantly effects the sealing ability of obturating materials used (REAL-SEAL, BEE-FILL21N1, GUTTA PERCHA without sealer). For the groups that received irradiation, a dose of 60 gray was delivered in fractions of 1.8 Gray per day, 5 days a week for 7 weeks. The specimens were then analyzed by SEM for marginal gap width and the images obtained were recorded and evaluated using Orion 6.604 software. All analyses were performed on Statistica software using Tukey’s post hoc test.

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**Conclusions:** This study demonstrated that there was no difference between the two groups in terms of the bone periapical destruction in rats taking Zol. Besides that it is possible to conclude that 99mTc-HMDP is a reliable method to assess the apical periodontitis.

**Methodology:** Ninety-six lateral incisor teeth were sectioned at or below the cementoenamel junction and were randomly divided into eight experimental groups (n = 12). Root canals were prepared using ProTaper rotary files, with the exception of the Self-Adjusting File (SAF) group. Canals were irrigated with 2 ml of 5% sodium hypochlorite (NaOCl) at each instrument change, and received a final flush with 10 ml of 17% EDTA and 10 ml of 5% NaOCl for 1 min. The surface of root dentin was observed using a scanning electron microscope. Statistical analyses of the data were performed using Kruskal–Wallis and Bonferroni adjusted Mann–Whitney U-tests (p < 0.05).

**Results:** This in-vitro study showed that; the use of EndoActivator, EndoVac, Ultrasonic and SAF systems increased efficacy of smear layer and debris removal, and furthermore manual dynamic activation increased efficacy of debris removal.

**Conclusions:** Neither technique completely removed smear layer from the root canal walls. However irrigation activation protocols (especially sonic, ultrasonic, apical negative pressure and continuous irrigation during instrumentation) increased the cleaning efficacy of root canal debridement in comparison with syringe irrigation.

**Microirricodontics**

Anuj Bhardwaj, Amit Bhardwaj, Amit Kumar Garg

Modern Dental College & Research Centre, Indore, India

**Aim:** Endodontists have always taken pride in saying that they can do much of their work blindfolded simply because there is “nothing to see.” The truth is always sour, that there is a great deal to see with the right tools. In the past decade, there has been an innumerable development of new technologies, instruments, and materials. These developments have improved the precision with which endodontic treatment are performed. These advances have enabled clinicians to complete procedures that were once considered impossible or that could be performed only by talented or lucky clinicians.

But the credit goes to the introduction and adoption of the Cone beam computed tomography (CBCT), Dental operating microscope (DOM) and irrigation devices, which has revolutionized how endodontics is practiced worldwide.

Until recently, endodontic therapy was performed using tactile sensitivity, and the only way to see inside the root canal system was to take a radiograph.

Before the CBCT and DOM, the presence of a problem (ledge, perforation, blockage, retreatment, broken instrument) was only “felt,” and the clinical management of the problem was never predictable and depended on happenstance. Most endodontic procedures occurred in a visual void, which placed a premium on the doctor’s tactile dexterity, mental imaging, and perseverance.

**Conclusions:** This presentation provides basic information on how a CBCT, DOM along with irrigation devices are used in clinical endodontic practice to make endodontics more of seeing rather than just feeling.

**POSTERS SESSION 01 (P001–P209)**

**Theme:** Dental Treatment & Restorative Dentistry: Caries

**P001**

**Restoration of Non-Caries Cervical Lesion in the First Maxillary Premolar**

Xiaoxuan Wang

Department of Oral VIP, Shanghai Second Medical University, Shanghai, China

**Purpose:** To investigate the factors such as cavity depth, shape restoration material and occlusal adjustment which had influences on the restoration of non-carious cervical lesion (NCCL) in the first maxillary premolar.

**Methods:** 3-D finite element models of adult first maxillary premolars which had cavities of different depths and shapes in buccal cervical region were built. The models were restored and divided into three groups: glass ion cement (GIC), amalgam and composite resin. We evaluated stress profiles and distribution in normal occlusions and malocclusion were evaluated from vertical and lateral loading.

**Results:** In normal occlusion, there was mainly tensile stress and uniform distribution on buccal cervical margin. Compressive stress appeared when approaching to tooth root. In malocclusion, there was mainly greater concentrated tensile stress on buccal cervical margin with vertical loading. The results showed that interface stress values of GIC and composite resin model were smaller than amalgam, the latter was 3–9 times greater than the former two.

**Conclusion:** For smaller cavity depth, cavity shape is not the primary factor affecting treatments of NCCL. But the rectangular cavity isn’t suitable for larger defects. There is positive correlation between stress values of restoration and cavity depth. Supported by Research Fund of Science and Technology.

**P002**

**Lactotransferrin Gene Polymorphism in Children with Dental Caries**

Michalova Volckova1, Petra Borilova Linhartova2, Tereza Trefna3, Jan Vlazny3, Kristina Musilova1, Martina Kukletova1, Lubomir Kukla4, Lydie Izakovicova Holla1

1Clinic of Stomatology, Institutions Shared with St. Anne’s Faculty Hospital, Faculty of Medicine, Masaryk University, Brno, Czech Republic, 2Department of Pathophysiology, Faculty of Medicine, Masaryk University, Brno, Czech Republic, 3Faculty of Medicine, Masaryk University, Brno, Czech Republic, 4Department of Social Medicine and Health Care Administration, Faculty of Medicine, Masaryk University, Brno, Czech Republic

**Aim:** The aim of this study was to determine the association between lactotransferrin (LTF) gene polymorphism and dental caries.

**Materials and methods:** Unrelated 13-years-old to 15-years-old children (n = 637) were enrolled into the study. They were divided
into two groups: caries free (DMFT = 0) and caries affected (DMFT ≥ 1). The LTF rs1126478 (140A/G exon 2, Lys/Arg) genotypes were determined by polymerase-chain reaction (PCR) with restriction analysis by Earl enzyme.

**Results:** There were no statistically significant differences between caries experience and allele or genotype distributions of the LTF rs1126478 variant in the total cohort. When the caries affected group (N = 482) was stratified according severity: low (DMFT = 1), moderate (2 ≤ DMFT ≤ 3), and high (DMFT ≥ 4) caries experience, allele and genotype frequencies were not significantly different.

**Conclusions:** Lactotransferrin 140A/G (exon 2, Lys/Arg) variant was not associated with dental caries susceptibility or severity in the Czech children.

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**P004**

**Evaluation of the Prevalence and Risk Factors of Mucous Retention Cyst**

Maryam Ehsani, Farida Abesi, Alireza Mirshekar, Hosein Heidari

**Endodontics Department, Faculty of Dentistry of Babol, Babol, Iran**

**Introduction:** Mucous retention cyst (MRC) is a kind of the mucus pseudocyst. MRC of the maxillary sinus are often found incidentally during the evaluation of radiographs. It is detected in panoramic radiography as well defined, smooth, dome-shaped radiopaque mass in maxillary sinus. It rarely causes any sign or symptom. The purpose of this study was to determine the prevalence and some associated risk factors of (MRC) in panoramic view in patients referring to the oral and maxillofacial radiology department of Babol dental school during 2011.

**Materials and methods:** In this cross sectional study, panoramic radiographs of 700 patients referring to oral and maxillofacial radiology department of Babol dental school were examined for detection MRC maxillary sinus for 1 year and MRC prevalence and some associated risk factors such as sex, site of occurrence, seasonal allergy, mouth and smoking habit were evaluated. The data were statistically analyzed by SPSS software and we used chi-square and t-tests. For all of tests the p-value of <0.05 was considered for statistical significance.

**Results:** Among 700 radiographs sixty-seven MRC was founded and the prevalence of this lesion was % 9.57. Prevalence of MRC was significantly higher among men (p < 0.05) and there were no significantly correlation between smoking, family history, seasonal allergy, mouth and smoking habit with MRC (p > 0.05).

**Conclusion:** The results of this study were similar to previous studies but despite the low incidence of this lesion, practitioners should pay special attention to these lesions in maxillary sinus.

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**P005**

**Origin of Fractures and Wear of Ni-Ti Endodontic Files**

Metref Zohier1, Serradj Sid Ahmed2, Souabi Ali2, Guendouz Djamel2

1Medical University, Oran, Algeria, 2Endodontics Department, Oran, Algeria

**Aim:** Endodontics concerns prevention, diagnosis and treatment of pulp diseases and associated periradicular complications.

**Material and methods:** The principles and the modalities of canal preparation and obturation are presently clearly systematized and accepted by a large number of practitioners. Shape Memory Alloys (SMA) and in particular Nitinol, open new perspectives. Nickel-titanium instruments have become an indispensable complement to traditional instrumentation in cleaning and shaping steps of canal system.

**Conclusion:** They allow a respect of canal anatomy, dentin and pulp debris removal toward coronal access, regular preparation and better adaptation of the main cone. However, these innovative technologies must not overshadow certain major disadvantages...
and their consequences such as difficulty in fabrication and ease of breakage of SMA.

P006
An Evaluation of the Apical Seal in Oval-Shaped Root Canals
Dilek Helvacıoğlu Yigit¹, Hasan Orucoglu², Tevfik Yavuz³, Cavit Isık Yavuz⁴, Ayça Simsek⁵, Yusuf Nuri Kaba¹, Samet Özden¹
¹Department of Endodontics, Kocaeli University, Kocaeli, Turkey, ²Department of Endodontics, Ahant İzzet Baysal University, Bolu, Turkey, ³Department of Prostodontics, Selçuk University, Konya, Turkey, ⁴Department of Public Health, Kocaeli University, Kocaeli, Turkey, ⁵Department of Endodontics, Istanbul University, Istanbul, Turkey

Aim: The purpose of the present study was to evaluate the apical seal obtained with lateral compaction of gutta-percha in oval-shaped root canals prepared with either self-adjusting files or Protaper rotary files.

Material and methods: Twelve pairs of extracted mandibular premolars with oval-shaped root canals were randomly divided into two groups. The first group was biomechanically prepared with Protaper files, while the self-adjusting file system was used in the second group. The roots were obturated using cold lateral compaction of gutta-percha. Apical microleakage was measured with the computerized fluid filtration method. The results were analyzed statistically using the Mann–Whitney U-test.

Results: All of the roots in both groups showed leakage. Group 1 demonstrated significantly less microleakage (p < 0.05). Instrumentation of oval-shaped canals using a self-adjusting file system with cold lateral compaction of gutta-percha demonstrated significantly greater apical microleakage when compared to Protaper.

P007
A Rapid Molecular Method for Detection and Identification of a New Candidate Endodontic Pathogen
Saengusa Khemaleelakul¹, Prakaimuk Saraithong²
¹Department of Restorative Dentistry, Chiang Mai University, Chiang Mai, Thailand, ²Dental Research Center, Faculty of Dentistry, Chiang Mai University, Thailand

Aim: Cultivation of endodontic anaerobic pathogens has several significant limitations, including time-consuming process, inability to detect fastidious and as-yet-uncultivated bacteria, and misidentification of species with aberrant phenotypic behaviors. The purpose of this study was to develop a rapid and reliable method for detection and identification of Prevotella baroniae, a new candidate endodontic anaerobic pathogen.

Materials and methods: A pair of specific primers was designed from the sequences of 16S rRNA genes of P. baroniae. The primers were tested with genomic DNAs of various oral bacteria by polymerase chain reactions (PCR) under an optimized condition. The amplified products were analyzed by agarose gel electrophoresis followed by SYBR® Safe DNA gel staining.

Results: It was found that, the primers were very specific for P. baroniae. The sensitivity of the PCR was 0.75 pg/μl. The specific fragment of approximately 848-bp could only be amplified from a standard strain and clinical strains of P. baroniae, but not from other bacteria. Digestion of the amplified products with a restriction enzyme; EcoRV, generated a specific pattern when separated by gel electrophoresis.

Conclusion: Our results show that the assay is very effective for rapid detection and reliable identification of P. baroniae.

P008
Antimicrobial Action of a Chinese Medicine Extract on E. faecalis Biofilm
Afzan Adilah Binti Ayoub¹, Gary Shun Pan Cheung²
¹Centre of Studies for Restorative Dentistry, Faculty of Dentistry, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia, ²Comprehensive Dental Care, Faculty of Dentistry, University of Hong Kong, Hong Kong

Aim: To investigate the effectiveness of various irrigants and an aqueous extract of Fructus mume in combating E. faecalis biofilm.

Methods: A mono-species biofilm of E. faecalis was cultivated for 3 days on Thermanox™ plates. Each biofilm specimen was subjected to 10 s of immersion in different irrigants: Fructus mume solution, citric acid, sodium hypochlorite or sterile saline. The amount of viable bacteria remaining on the substrate was quantified by LIVE/DEAD® BacLight™ staining and confocal light scanning microscopy (CLSM). Then, the same biofilm was retrieved and processed for scanning electron microscopy (SEM).

Results: Images were obtained from 12 sites throughout the biofilm, which were grouped into four regions of concern: Bottom where it would be immersed in the solution for most of the duration of the experiment; Centre where it was struck by the stream of irrigant; Middle and Upper where the effect was due to splash or vapour of the irrigant. Results of the amount of viable bacteria residual indicated that Fructus mume showed no significant activity, with an effect similar to physiological saline or citric acid, and significantly inferior to sodium hypochlorite.

Conclusion: Sodium hypochlorite (0.5%) solution was superior to citric acid, Fructus mume and physiological saline as an antimicrobial agent against E. faecalis biofilm.

P009
Periapical Status in an Algerian and French Population
Oudghiri Fouad¹, Lasfargues Jean Jacques², Serradj Sid Ahmed³
¹Fouad Oudghiri, ²Jean Jacques Lasfargues, ³Sid Ahmed Serradj

Aim: The prevalence of apical periodontitis and the quality of root fillings and restorations were determined in an Algerian and French population.

Material and methods: Full-mouth periapical radiographs of 507 French and 216 Algerian adult patients were examined. The occurrence and technical quality of root fillings were assessed for each root according to the position and the density of the obturation. The periapical status was evaluated using the Periapical Index Scoring System.
Results: The frequency of apical periodontitis in ours Algerien and French sample is respectively 7.33% and 5.23%. It is above the averages of the other studies (5.2%) indicating values between 0.6% and 9.8%.

The prevalence of the apical periodontitis in our Algerian sample is more alarming, where 84.26% of the patients develop an apical periodontitis. This result is the highest off all the previous studies (59.7–68.3%). This risk is important, which places the apical periodontitis in the forefront in the epidemiologic scale of infectious disease and constitutes a real problem to public health.

The radiographic quality of endodontic treatments for our Algerian sample is incorrect for 88% and 64.2% for our French sample. The risk of seeing an apical periodontitis develop is significantly higher with inadequate treatment than for teeth with an adequate filling.

Conclusion: Our epidemiologic results revealed a strong correlation between the bad quality of endodontic procedures and the prevalence of apical periodontitis. The improvement of the quality of endodontic treatment using efficient technical is a great necessity to the public health.

P010
Biological Evaluation of Ca(OH)2 Psidium cattleianum Plant Extracts Associated with and Calcium Hydroxide
Eloi Dezan Junior, Diego Valentim, Loiane Massunari, Joao Eduardo Gomes Filho, Aguihaldo Candido Da Silva Facundo, Camilla Pires Bruno, Gustavo Arcos Lopes, Luciano Tavares Angelo Cintra
UNESP – Univ EST Paulista School of Dentistry

Objectives: Leaf extracts of araça (Psidium cattleianum) exhibit biocompatibility and inhibitory activity against oral microorganisms. Association of this hydroalcoholic extract to Ca(OH)2 imbibed E. faecalis in 24 h wile Ca(OH)2 associated with propylene glycol extract and distilled water needed 7–14 days. Evaluation of biological immediate and late response of calcium hydroxide pastes associated to ethanolic and watery solutions prepared with vegetable extract of araça compared with CH and distilled water.

Material and methods: For the edemogenic analysis (immediate reaction), we used 18 male mice. Under general anesthesia, the animals received intravenous injection of 1% Evans blue. Thirty minutes later, it was injected 0.1 ml of one of the pastes, on the dorsal under skin region of the animal. The animals were euthanized after 3 and 6 h and the obtained material was put in formamide for 72 h for spectrophotometer. For the morphological analysis, 30 mice received polyethylene implant with the pastes extracts or saline on dorsal region. Analysis were after 7, 28, 60 and 90 days for the thickness evaluation of the fiber capsule and counting of the damaged cells, that quantified the damaged infiltrate.

Results: The associations of calcium hydroxide with hydroalcoholic extract of Psidium cattleianum and in propylene glycol extract presented similar results to calcium hydroxide and distilled water.

Conclusion: Association of calcium hydroxide to Psidium cattleianum extracts are biocompatible.

P011
In Vitro Comparative Study Between a Manuel System Hand Files, and Rotary Intramation (R-ENDO) for Endodontic Retreatment
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Aim: When root canal treatment fails, treatment options include conventionnel retreatment, periapical surgery, or extraction.

Retreatment should be considered the first choice because it is the most conservative method to resolve the problem.

Actually, root canal preparation with rotary NiTi instruments has became popular, these instruments were proposed as alternatives to manual instrumentation for the removal of filling materials from root canals.

The aim of this study is to compare, in vitro, between two systems of endodontic retreatment: one manual using manual files (handstrom files) with a step-back procedure, and the second using a rotary instrumentation with R-Endo.

Materials and methods: In this present study, 20 teeth were randomly divided for retreatment into two groups of 10 teeth each one:

Groupe1 with manual files and step-back procedure in sizes 20.25.30.35.40 oh handestrom files.

Groupe2 with R-endo system retreatment using a NiTi instrumentation were used with an inget type contra-angle handpiece at low 300 rpm.

Results: Group 1 for the 10 teeth endodontically taken only eight of these have been restated to be a time in the laboratory for about 1 h each tooth, whereas for group 2 the practice of re-treatment was easier. Radiologiques of criteria that distinguished endodontic retreatment manual shown leftover pasta or cones of gutta percha in the root canal up to 85% for group 1, whereas in group 2 only 5% showed visible in the X-ray control.

Conclusion: Endodontic retreatment with the R-endo system is faster clinically simpler, more effective than manual.

P012
Evaluation of the Effect of Nanosilver Suspension on Antimicrobial Activity of MTA and CEM
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Aim: The ideal root-end filling material seals the contents of the root canal system within the canal should be not only have good physical properties nonresorbable, biocompatible and but also have good antimicrobial activity against microorganisms.

The aim of this study was to evaluate the antimicrobial activity of MTA and CEM mixed with nano silver suspension.

Materials and methods: Cements used in this study included ProRootMTA and CEM and the microorganisms were Enterococcus faecalis, Streptococcus mutans, Candida albicans, Actinomyces,
Escherichia coli and mixture of these microorganisms. Nano silver suspension was used.

Contact dilution and colony count method was used to evaluate the antibacterial activity of these cements. Cements mixed with liquid or two concentrations of nano silver suspension were placed into the sterile microtubes. Then the standard suspension (0/5 McFarland) of each microorganism was added to each microtube. Colonies were counted after After 0, 24, 48, 72 and 96 h intervals incubation at 35°C.

Results: The result showed that MTA and CEM had antibacterial activities on all microorganisms strains except for Enterococcus faecalis and mixture group. MTA had better antibacterial activity than CEM but this difference was not significant. The combination nano silver suspension with two cements resulted into higher antimicrobial activities.

Conclusion: Mixture of MTA and CEM with different concentration of nano silver suspension significantly increased the antibacterial activity.

P013
Unintentional Extrusion of MTA in Treatment of Immature Tooth
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Introduction: Obturation of nonvital permanent teeth with immature apices can be performed using an apical barrier material. Mineral trioxide aggregate (MTA) is a well-known root-end closure material for non-surgical management of wide open apices. However, it is difficult to avoid extrusion of MTA into periradicular tissues. This case report presents the healing after unintentionally extrusion of MTA into periradicular lesions.

Methods: Thirteen year-old male patient was referred for root canal treatment. The patient had no trauma history that he remembered. Clinical examination revealed that maxillary left lateral incisor was asymptomatic and had normal mobility and no sinus tract was present. Radiographic examination demonstrated an open apex and radylucency at the periradicular area of the maxillary left lateral incisor. The tooth was not responsive to the sensitivity tests. It was decided to perform root canal treatment by an apical barrier technique. MTA has chosen as barrier material. After instrumentation and irrigation procedures, the apical third of the canal was obturated with MTA. The remaining canal space was filled with warm vertical gutta percha using Obtura II. During the placement of MTA, material was inadvertently extruded beyond the apex. The patient was recalled 3, 6 and 12 months after the treatment.

Results: The clinical and radiological follow-up revealed that the tooth was asymptomatic and repair of the lesion was achieved without endodontic surgery.

P014
Effect of Gutta-percha with Calciobiotic sealer vs. Resilon with Epiphany Sealer on Healing of Periapical Tissues
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The present study was designed to compare clinically and radiographically the effect of two root canal filling materials “Gutta-percha with Calciobiotic sealer vs. Resilon with Epiphany sealer” on healing of periapical tissues.

Materials and methods: Thirty single rooted teeth from 21 patients were selected, with their ages ranged from 20 to 40 years. The selected teeth had necrotic pulp with varying degree of periapical inflammation. The teeth were divided into two groups of 15 teeth each. Teeth of group I were filled with Gutta-percha points and Calciobiotic sealer, while teeth of group II were filled with Resilon points and Epiphany dual curing resin sealer and Epiphany self etching primer. Obturation was performed after obtaining negative bacteriological culture from the canals. Clinical and radiographical examination was conducted immediately after treatment and after 3, 6, 9 and 12 month postoperatively. Evaluation was carried out using the periapical index scoring system (PAI). Readings were collected and subjected to statistical analysis.

Results: Although no statistical significant difference was reported between the two materials, Statistical analysis of the results showed that teeth treated with Resilon had a higher healing rate (83.3%) compared to those treated with Gutta-percha (60%) after 12 months, while Gutta-percha had a higher improvement rate (40%) compared to Resilon (16.7%).

Conclusion: Resilon acted clinically as gutta-percha and could be used successfully as a root canal filling material.

P015
Contribution of Passive Ultrasonic Irrigation and Nd: YAP Laser in Reducing the Bacterial Flora Root Canal
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Objective: The purpose of the study is to demonstrate the ability of the PUI and the laser used to eradicate final irrigation canal endodontic flora compared to conventional irrigation

Materials and methods: A total of 126 teeth gangrene, monoradicular, freshly extracted were sectioned at DEJ.

One for each tooth bacteriological sampling was performed before treatment and then the teeth were endodontically treated with hand instruments steel.

Results: Forty-seven percent eradication of endodontic flora with conventional irrigation, 93% with 100% and PUI with LASER.

The teeth were then randomly divided into three groups of 42 teeth each:

(1) The first group served as control received at the end of treatment a conventional irrigation with sodium hypochlorite 2.5%
(2) The 2nd group received treatment at the end of passive ultrasonic irrigation for one minute

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(3) The 3rd group was treated at the end of preparation with the Nd: YAP laser
(4) At the end of treatment a second bacteriological sampling was done immediately for each tooth.
(5) Bacteriological analysis was performed according to the standards of Microbiology.

P016
Contribution of the Continuous Rotation and the EDTA in the Infection Control Ductal
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Objective: The objective of the study to compare the efficacy and rotary instruments associated with the use of EDTA during the preparation to eradicate flora endodontic hand instruments compared to steel

Materials and methods: The study was conducted in vitro, gan-grene teeth, freshly extracted single rooted.

All teeth were thoroughly cleaned and sectioned at the crown.

On each tooth, a bacteriological sampling was performed before and after root canal treatment using sterile paper points and analyzed according to standard microbiological

The study was performed on a total of 84 teeth randomly divided into four groups as follows:

(1) The first group was prepared manually with steel instruments and received sodium hypochlorite 2.5% as irrigating
(2) The 2nd group was prepared manually with steel instruments and received sodium hypochlorite 2.5% associated with 17% EDTA as irrigant
(3) The 3rd group was prepared with rotary instruments Hero Shaper and received sodium hypochlorite 2.5% as irrigating
(4) The 4th group was prepared with rotary instruments Hero Shaper and received sodium hypochlorite 2.5% associated with 17% EDTA as irrigant

Results: Twenty-three percent eradication of germs to the teeth of the first group, 56% in the 2nd group, 47% for the 3rd group and 68% for the 4th group.

P017
Antimicrobial Efficacy of Gaseous Ozone in Infected Root Canals. In Vivo Study
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Aim: To determine antimicrobial efficacy of gaseous ozone in infected root canals combination with 2.5% NaOCl, 2% CHX and 0.9% NaCl.

Materials and methods: This in vivo study includes 30 male/female. The samples groups were divided into two test group. Treatment protocol was as follows: Group 1(test) was irrigated with 2.5% NaOCl + gaseous O3 (Prozone, WH Austria) 18” and 24”, Group 2(test) was irrigated with 2.5% CHX + gaseous O3 18” and 24” and group 3(control) was irrigated with 2% NaCl + gaseous O3, 18” and 24”. All of the treat teeth bacterial samples were taken as the per following protocol: sample 1 (D1) at the baseline (no irrigation), sample 2 (D2) after first 18” exposure to gaseous O3, sample 3 (D3) after second 24” exposure to gaseous O3, and sample 4 (D4) 3 days after treatment. Cultivable bacteria recovered from root canals were counted. Data were analyzed by One Way ANOVA and Kruskal–Wallis test.

Results: There was significant (p < 0.05) reduction of aerobic bacteria in second group (2% CHX) at D4.

Conclusion: None of these combinations yielded bacteria free canals. Group 2 (2% CHX) at D4 showed better efficacy toward aerobic/anaerobic bacteria.

P018
Determination of Effects of Propolis in Root Canal Disinfection as an Intracanal Medicament: A Clinical Study
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Aim: The purpose of this study was to determine the effects of propolis in root canal disinfection as an intracanal medicament.

Materials and methods: Nineteen patients presenting as emergencies to our clinic were included in the study. Inclusion was limited to patients with a diagnosis of pulp necrosis and obvious periapical radiolucency. All teeth underwent conventional root canal treatment, which involved the instrumentation to the apices of each canal at the first visit. After 1 week, powder propolis was instructed to root canals with glycerin, and procedure was finished by temporary filling material. Propolis was removed after 3 weeks and root canal treatment was finished with gutta-percha and permanent filling material. Healing was controlled by radiographically and clinically for each month.

Results: After 1 year follow-up only two patients failed and apical resection was chose as a treatment modality. Seventeen patients have no either clinically or radiographically symptom after 1 year follow-up period.

Conclusion: According to these results propolis would be used as an intracanal medicament, but this study must be confirmed by more studies and under different clinical conditions.

P019
Comparison of the Antimicrobial Effects of Various Root Canal Medicaments on Microorganism (An In Vitro Study)
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According to the findings, 2% chlorhexidine gel showed the most efficient antimicrobial activity against E. faecalis, which was followed by calcium hydroxide and chlorhexidine gel.

P020
Evaluation of NiTi Rotary System and Hand Files on Young Permanent Teeth by Using Micro-Computed Tomography
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Aim: Several studies show that the success and reliability had proven of the NiTi rotary systems used in the root canal treatment. However, there isn’t enough information to use in young permanent teeth. The purpose of this study is to evaluate the shaping properties of NiTi Rotary systems and hand files on young permanent teeth per root canal volume changes, unprepared surface area, and deviations occurred at the centerline of the canal by using micro-computed tomography (μCT).

Material and methods: In the study, 30 second molar teeth that were extracted from patients 15–18 years old were used. (i) Group-NiTi hand files: was prepared with the conventional step-back technique (2.25% NaOCl). (ii) Group-NiTi rotary system: was prepared with crown-down technique (lubricant gel, 2.25% NaOCl). Before and after root canal preparation, the root canal volume changes, the percentage differences between these volumes, the ratio of unprepared surface areas to the total surface areas, and amount of canals deviation from the center line were evaluated with the recorded μCT data and analyzed statistically.

Results: As a result, the canal volume differences and percentage increase in volume, before and after preparation was statistically significant (p < 0.05) among all canals in both groups. When an evaluation was made between Ni-Ti hand files group, and Ni-Ti rotary system group, and also within groups, the root canal volume changes, the percentage differences between these volumes, unprepared surface area ratio to the total surface, and deviation of root canal from the center line had statistically no significant differences (p > 0.05).

P021
In Vitro Evaluation of the Effects of Different Power Parameters of KTP Laser on Smear Layer and Temperature Change
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Objective: The purpose of this study is in vitro evaluation of the effects of KTP laser applied to root canals at different power parameters on the smear layer and the temperature changes.

Material and methods: Two hundred four single-rooted mandibular premolars teeth, 85 for evaluate temperature changes and 119 for smear layer, were employed. All of the root canals were prepared at 1 mm short of the apical foramen by a conventional technique using K-files by the step-back technique. The temperature rise was evaluated using an infrared thermographic camera during different power parameters (1W, 1.5W, 2W, 3W, 4W Ton: 10 ms, Toff: 50 ms, repeated mode) KTP laser irradiation. Roots bisected longitudinally and SEM evaluations were made with ×1000 magnifications. Data were analyzed statistically using Kruskal–Wallis and Tukey’s tests.

Results: In all areas, the difference between the group where 17% EDTA was used and all other groups were significant while in apical 1/3 area the difference between the group where 2.5% NaOCl group was used and 4 W KTP laser groups was significant and in the middle 1/3 area the difference between, with 1.5 W KTP laser group and KTP laser group 1.5 W KTP laser group and the group where 2.5% NaOCl group was used was found significant (p < 0.05). Increase in temperature values in all groups were found to be below 10° centigrade in 20 s.

P022
Effect of Diode Laser on Antibacterial Activity of Natural Irrigation in Contaminated Root Canals (In Vitro)
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Aim: The purpose of current investigation was to evaluate the combination effect of diode laser on antibacterial activity of Vinegar/Morinda Citrifolia juice and 2% Chlorhexidine (as a control group) in Enterococcus faecalis inoculated root canal dentines.

Materials and methods: Forty single human teeth were selected and after ethical and experimental consideration. All specimens were instrumented up to the apical size (40), in addition smear layer was remove and transferred to sterile Brain Heart Infusion (BHI) broth and then autoclaved. All specimens were contaminated with E. faecalis and incubated for 7 days. In each group
half specimens (n = 5) after incubation period samples underwent laser irradiation by diode laser emitting at a wavelength of 810 nm and power of 2 W subsequently. The samplings from root canal dentine walls were taken place at the 7 days and colony counting was done.

**Results:** Statistical analysis of data using Kruskal–Wallis and Mann–Whitney tests showed a significant difference between all groups (p < 0.0001).

**Conclusions:** It was concluded that 2% Chlorhexidine followed by a final flush of diode laser at a wavelength of 810 nm can be regarded as an effective solution on eliminate of *E. faecalis* of root canal dentin.

**P023**

**Effects of Ultrasonic Root-End Cavity Preparation with Different Retro-Tips and at Different Power-Settings on Micro-Leakage**

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**Aim:** The aim of this in-vitro study was to evaluate the effects of different ultrasonic surgical-tips and power-settings on micro leakage of root-end filling material.

**Methodology:** A hundred extracted human single-rooted teeth were selected for this study. The coronal parts of the teeth were removed at the semento-enamel junction and the root canals were instrumented with a crown-down technique using ProTaper rotary files up to file F3 at the working length. The root canals were filled with ProTaper F3 gutta-percha and AH Plus root canal sealer using a single-cone technique. The apical 3 mm of each root was resected and the roots were divided into six experimental groups 15 root each. Ten roots were used as negative and positive control groups. Root-end cavities were prepared with diamond coated, zirconium nitride coated and stainless steel ultrasonic tips at half power and high power settings. Root-end cavities were filled Super-EBa regular set. Leakage of specimens was evaluated with glucose penetration method after 1, 2, 3, 4 weeks. The results were statistically analyzed with Kruskal–Wallis and Hollander–Wolfe tests.

**Results:** There were no statistically significant differences in the glucose penetration between the groups at first and second weeks (p > 0.01). Diamond-coated surgical tip showed the least leakage at high-power setting at third and fourth weeks (p < 0.01).

**Conclusion:** Under the conditions of this study, the leakage of the root end fillings was the least when diamond-coated retro-tip used at high-power setting.

**P024**

**The Effect of Application Thickness on Microleakage of Bioaggregate used in One-Step Apexification Models**

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**Aim:** The aim of this study was to evaluate the microleakage of different thicknesses of Bioaggregate [BioAggregate, Verio Dental Co. Ltd., Vancouver, Canada] (BA) and 4-mm-thick mineral trioxide aggregate [White ProRoot MTA, Dentsply, Maillefer, Switzerland (WMTA)] in an apexification model using liquid transport model.

**Materials and methods:** Thirty-two mandibular premolar teeth extracted for orthodontic reasons were sectioned at the cemento-enamel junction and 3–4 mm from the tooth apex to obtain 12-mm-long root segments. To mimic the clinical situation, apical and coronal thirds were prepared with No. 2–6 Gates Glidden burs. Teeth were divided into three groups according to material and thickness, as follows: Group 1: 2 mm BA; Group 2: 4 mm BA; Group 3: 12 mm (total length) BA; Group 4: 4 mm WMTA (control). Teeth were stored at 37°C for 4 days to allow the material to set, the empty parts of the roots in Groups 1, 2 and 4 were filled with gutta-percha and root canal sealer, and leakage was measured using liquid transport method. Data was analyzed with SPSS statistical software (Version 11.5; SPSS Inc, Chicago, IL) using the Kruskal–Wallis H test. A p-value of <0.05 was considered statistically significant.

**Results:** No statistical differences in microleakage were observed between Groups 1, 2 and 4 (p > 0.05). Group 3 showed significantly less leakage than the other groups tested (p < 0.01).

**Conclusion:** Using BA to completely fill the root canal gives ideal results in one-step apexification; however, considering the cost of the material, 2–4 mm may be used instead with success.

**P025**

**In Vitro Fracture Resistance of Roots Obturated with Different Sealers**

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**Introduction:** The aim of this study was to evaluate the fracture resistance of teeth filled with three different endodontic sealers.

**Methods:** Seventy-five single-rooted extracted mandibular premolars were decoronated to obtain 13 mm length. Teeth were randomly divided into five groups (n = 15). In group 1, teeth were left unprepared and unfilled (negative control). The rest of the roots were prepared with the ProTaper System up to a master apical file size of F3. Group 2 was left unobturated (positive control), group 3: bioceramic-based sealer (Endosequence BC sealer) + gutta percha, group 4: MTA-based sealer (Tech Biosealer Endo) + gutta percha, group 5: epoxy resin-based sealer (AH Plus Jet) + gutta percha. The specimens were stored for 2 weeks in 100% humidity to allow complete setting of the sealer. The roots were subjected to fracture testing under universal testing machine. The force required to fracture was recorded as Newtons (N). Data were analyzed statistically by one-way ANOVA followed by Tukey’s multiple comparison test.

**Results:** Mean fracture load was recorded as follows: group 1 (470.68 N), group 2 (320.19 N), group 3 (457.61 N), group 4
Apical Microleakage of Root Canal Sealers: A Comparative Study

P027

Apical Microleakage of Root Canal Sealers: A Comparative Study
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Aim: Root canal sealers should ensure an impervious seal of the apical portion of the root canal systems. The purpose of this in vitro study was to compare apical microleakage of three root canal sealers.

Materials and methods: For this study, 60 single rooted human teeth were used. They were divided into three experimental groups and 12 teeth were also divided into three control groups. All of the teeth were instrumented using the step-back technique and sealed with cold lateral compaction of gutta-percha with Pro Root MTA TM, GI Fuji I or Endo Rez. Apical microleakage was measured using dye penetration method of 2% methylene blue. The samples were incubated (at 37°C for 7 days and 100% humidity). Following longitudinal sectioning, linear dye penetration at the apical third of the roots was recorded with a stereomicroscope at 20× and 30× magnification. The results were analyzed using descriptive statistics and T-test.

Results: Maximum rate of dye penetration was the following: MTA 1.07 mm, GIC 0.23 mm and EndoRez 1.01 mm. Comparison of the results demonstrates that GIC had the lowest dye penetration rate.

Conclusions: There was a significant difference in dye penetration rate between MTA fillet teeth and GIC and EndoRez, respectively.

P026

Longitudinal Assessment of Biocompatibility and Healing Response of MTA Fillapex
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Aim: A longitudinal assessment of biocompatibility and wound healing tissue responses of MTA Fillapex and AH-Plus using rat subcutaneous implants.

Materials and methods: Fifteen adult female Wistar albino rats were divided into three groups according to three experimental periods (3, 7, and 30 days), five animals for each period. Group 1: MTA Fillapex, Group 2: AH-Plus, Group 3: control. Sealers loaded in sterile polyethylene tubes were surgically implanted subcutaneously in each animal, two with the tested sealers and an empty control tube. Tissue specimens were collected and histologically stained with H&E and Masson Trichrome. Immunohistochemistry was applied to assess the healing response using: Transforming Growth Factor Beta-1, Proliferating Cell Nuclear Antigen, Matrix Metalloproteinase 9 and Fibronectin. Kruskal–Wallis test was used to compare the three experimental groups as well as to compare between the three time periods. The significance level was set at p ≤ 0.05.

Results: There was no statistically significant difference in necrosis and inflammation mean scores within the three groups through all periods. After 3 days; MTA Fillapex showed the highest mean granulation tissue, TGF-β1 and PCNA positive cell count area percentages. After 1 week MTA Fillapex showed the highest mean granulation tissue, TGF-β1, PCNA positive cell count and MMP-9 area%. After 1 month MTA Fillapex showed the highest mean granulation tissue, PCNA positive cell count, MMP-9 and fibronectin area%.

Conclusion: Both sealers showed similar biocompatibility outcome while MTA Fillapex revealed an enhanced healing response compared to AH Plus.
**Theme: Dental Treatment & Restorative Dentistry: Esthetics**

**P029**
**The Effect of Irrigation Solutions on the Bond Strength of Cemented Fiber Posts**
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**Objectives:** To evaluate the effect of endodontic irrigants on the bond strength and resin tag formation of fiber posts cemented with resin cement.

**Methods:** Fifty-two human anterior teeth were stored in 1% sodium azide. The crowns were sectioned 2 mm incisal from the CEJ. Endodontics was performed using 6.15% NaOCl during instrumentation and a final flush with 17% EDTA. Root canals were obturated with gutta percha and sealer. Teeth were assigned into four groups for post space rinsing (n = 13); Group 1- 6.15% NaOCl; Group 2- 17% EDTA; Group 3- 6.15% NaOCl + 17% EDTA; Group 4- 6.15% NaOCl + 0.12% Chlorhexidine. Parallel-sided fiber posts were cemented with self-adhesive resin cement and samples were embedded in a PVC mounting jig for sectioning. Cervical and apical sections, were subjected to a push-out test using an Instron and failure mode was analyzed.

**Results:** Group 2 had the highest bond strength, (18.63 ± 2.85 MPa cervical; 13.49 ± 3.67 MPa apical) and was significantly higher than other groups. Cervical specimens in Group 3 had the next highest bond strength (11.22 ± 4.55 MPa). Group 1 had the lowest bond strengths, 5.93 ± 2.33 cervical and 5.18 ± 1.53 apical. Adhesive failure was the main failure mode in all groups. Groups 2 and 3 showed better resin tag formation, while Groups 1 and 4 showed less resin tag formation

**Conclusions:** Irrigation with 6.15% NaOCl reduced the bond strength of cemented fiber posts. Post spaces irrigated by 17% EDTA produced higher bond strength and more distinct resin tag formation.

**P030**
**Distribution Evaluation of Anterior Teeth Color in Client Patients of Gilan Dental School**
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**Aim:** As maxillary anterior teeth have important role in esthetics, knowing the common shades can help dentists to achieve best treatment so this article evaluates the most prevalent upper anterior teeth in different ages and gender.

**Material and method:** Upper central incisor of 600 clients of clinic of rasht dental school (in north of Iran) primarily were cleaned with low speed hand piece and slurry of pumice then their color shade were selected by Vita standard shade guide under standard daylight lamp. 288 of samples were female and 312 male. Shade selection were made in four age groups: 20–29, 30–39, 40–49 and 50–59 years old.

**Results:** In females the most prevalent shades were: in 20–29 year: A2 with 54.05%, 30–39 year: A3 with 36.5%, 40–49 year: A3 with 44.4% and 50–59 year: A3 with 33.3%.

The most prevalent shades in males: 20–29 year: A2 with 33.3%, 30–39 year: A3 with 40.8%, 40–49 year: A3 with 46.1% and 50–59 year: A3 with 31.2%.

In overall the most prevalent shade without relation to age and gender was A2 with 32.5% and the least was C1 with 0.3%.

**P031**
**Orthodontic and Prosthetic Rehabilitation of a Patient with Cleft Lip and Palate**
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**Aim:** In this case report, orthodontic and prosthetic treatments of a cleft lip and palate case is presented.

**Methods:** A 18-year-old man with a cleft lip and palate presented with a concave facial profile due to maxillary hypoplasia. The patient exhibited sagittal and transverse maxillary deficiency. On treatment, narrow upper arch was corrected with orthodontic expansion appliance and tooth alignment problem was corrected with fixed orthodontic treatment. Metal brackets with 0.018 x 0.022" slots were bonded to maxillary and mandibular teeth. Orthodontic leveling and finishing stages were performed in 22 months period. Following the orthodontic treatment, the missing teeth was restored and the occlusion problem was solved with fixed prosthetic appliance.

**Conclusion:** Correction of the malocclusion improved the patient’s speech and pronunciation. As an added benefit, the patient reported a better self-esteem and a greater degree of pleasure related to his appearance. This case report demonstrated the need for multidisciplinary treatment in patients with CLP.

**P032**
**In Vitro Determination of Permanence of Tooth Bleaching**
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**Aim:** This study aims to compare the whitening efficacy of bleaching techniques and bleaching agents with distinct concentrations by spectrophotometric analysis methods with painting the tooth, bleaching with related techniques, then recoloring with the same matters.

**Methods:** The samples used in the study are consisting of tooth exposed to a special preparation to cause interior coloring. Eight experimental and three control groups are formed with seven samples in each group. Five color measurements (The initial color,
kept in the coloring matters, after the bleaching after the kept in artificial saliva and after the recoloring of the same coloring materials) of the samples has been made with the spectrophotometer.

For the evaluation of the results obtained from the study, non-parametric Kruskal–Wallis one-way variance analysis was used.

For the evaluation of the results obtained from the study, non-parametric Kruskal–Wallis one-way variance analysis was used.

Results: As the result of the study, a similar whitening level was observed by changing the application time and number of whitening agents in different-concentrations, and while evaluating the recoloring level of bleaching, even there exists some minor distinctions in bleaching agents; no difference has been seen from statistical perspective, and in the meantime no effect has been derived as the bleaching application increase the possibility of recoloring of the tooth (p > 0.05).

Conclusion: According to our study, the bleaching application does not lead to an increase in the tendency of restaining of the tooth.

P033
The Golden Proportion Among Malay Students in IIUM/Malaysia
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Objectives: The maxillary anterior teeth are significant in achieving beautiful dental aesthetics. This study aimed to find the application of golden proportion on Malaysian populations.

Materials and methods: The sample size consisted of 100 students from any faculty, 50 men and 50 women, ranging in age from 20 to 25 years old. The subjects have all of their natural anterior teeth, no history of orthodontic treatment or tooth size alteration and are of Malay origin. Impression was taken and measurements done by using cast. The golden percentage calculated by dividing the width of each central incisor, lateral incisor and canine by the total width of all six maxillary anterior teeth, multiplied by 100 in order to obtain the golden percentage for each tooth.

Results: The golden proportion found to be accurate between the width of the right central and lateral incisors in 33.2% of men and 33.1% of women subjects. 13.9% of male and 13.6% of female subjects have the widths of their right lateral incisors in golden proportion to the widths of their right canines. Moreover, the data shows 37.2% of the male and 37.1% of the female subjects have the widths of their left central incisors in golden proportion to the widths of the left lateral incisors.

Conclusion: Golden proportion is applicable to Malay population. The width of the central incisor represents 24%, lateral incisor 16% and canine 10% of the width of the six maxillary anterior teeth as viewed from the front.

P034
Reattachment of Dehydrated Tooth Fragments: Two Case Reports
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Introduction: Anterior crown fractures are the most common type of injury in dental trauma. Restoration of the tooth by reattaching the original fragment is the best way of treatment in aesthetic, conservative and economic point of view. The concept of reattachment began in 1964 by Chosack and Eidelman. In the following years various techniques have been described and due to the developments in adhesive technology reattachment treatment became very simple and successful. The ideal treatment is to reattach the fragments as quickly as possible following intraoral and radiographic examination, but sometimes delayed treatment appointments are necessary because of uninformed patients/parents or multidisciplinary cases included endodontically and periodontically. Delayed reattachment may lead to anesthetic results because of the dehydration of fragments.

Case: The purpose of this study was to present 1 year follow ups of reattachment of dehydrated fragments by using self-etch adhesives and flowable composites in two different cases.

Conclusion: The colour of the dehydrated fragments were natural in the control appointments and 1 year follow ups show harmonious integration of colour, form and texture after the reattachment of the original piece of tooth.

P035
Minimal Invasive Approach in Restorative Dentistry
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Introduction: There are many treatment alternatives to correct the esthetically compromised maxillary anterior teeth. Today, satisfactory results can be obtained in restorative dentistry at baseline (luting appointment of indirect restorations) thanks to the improvements in dental technology. In addition to clinical success at baseline, long-term clinical outcome of indirect restorations is of great importance. At this point, which restoration type will be performed and tooth preparation depth for each indirect restoration should be strictly considered. It was accepted that the lesser the tooth tissue removing for indirect restorations, the lower the risk of complication in long-term clinical use of them. Because of their esthetic appeal, biocompatibility and adherence to the physiology of minimal-invasive dentistry Porcelain laminate veneers (PLV) have now become a restoration of choice. PLVs provide an alternative to complete coverage as they avoid aggressive dental preparation.

Case: This study describes the minimal invasive approach in restorative dentistry and treatment steps of three esthetically compromised cases.
**P036**

**Comparison of Cytotoxicity of White and Grey Mineral Trioxide Aggregate (MTA) with Calcium Enriched Mixture (CEM)**

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**Objectives:** The aim of this study was to compare the cytotoxicity of a newly invented root filling material, CEM, with Angelus white and grey MTA on L929 and Saos-2 cell lines.

**Materials and methods:** Sterile set discs of each material were prepared and extracted by immersing in 1 ml complete media for 24, 48 and 72 h. Three different dilutions of each cement extract in complete media were added to 24 h cultured L929 and Saos-2 cell lines in 24 well plates. After 24 h exposure to the extracts, cell cytotoxicity was measured using MTT assay. Data were analyzed by one way ANOVA and Tukey’s post hoc tests.

**Results:** MTT assay results revealed that none of 24, 48 and 72 h extracts/dilutions of white and grey MTA was cytotoxic. The 48 and 72 h CEM extracts were cytotoxic at 0.5 and 1 dilutions. All of tested materials were cytotoxic on Saos-2 cell line at dilution 1 after 24, 48 and 72 h extraction. Also 72 h extracts of all tested materials were cytotoxic on Saos-2 cell line.

**Conclusion:** It seems white and grey MTA to have similar cytotoxicity’s on both cell lines. On the other hand, while CEM showed cytotoxicity similar to white and grey MTA on Saos-2 cell line, it seems to be more cytotoxic on L929 cell line at least by some extraction periods/dilutions.

**P037**

**The Influence of Different Ceramic Bases on the Veneering Colour**

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**Objectives:** Metal free contemporary dental materials produce a solution for aesthetic and strength problems together. Despite of these advantages, these materials may cause some limitations due to the colour reflection of their core structures. The aim of this in vitro study was to compare the influence of base colour of two strengthened core ceramic materials on the veneering.

**Materials and methods:** Square-shaped ceramic framework specimens (5 x 5 x 1.5 mm) were prepared from two commercially available zirconium oxide Y-TZP ceramic, Cercon (Degussa Dental, Germany) and the lithium disilicate glass ceramic, IPS Empress 2 (Ivoclar, Vivadent, Leichtenstein). Shade A1veneering ceramic Cercon Ceram and Ivoclar d. Sign were applied over zirconium oxide and lithium disilicate glass ceramic specimens respectively. Colour of all the specimens were tested and measured with the aid of a chromameter (SHOFU Shade Eye NCC, U.S.A) and evaluated according to CIELAB formula.

**Results:** The grades for Vita A1 standard colour according to Bio-material properties database of Michigan Universities are of L* = 79.37, a* = -1.61, b* = 13.05, and ΔE*ab = 80.65. Due to these standard data, the colour match of Zirconium oxide ceramics (L* = 80.03, a* = -1.19, b* = 12.63, and ΔE*ab = 81.03) are more close to the standards however was diverse lithium disilicate ceramics (L* = 75.56, a* = -2.04, b* = 10.34, and ΔE*ab = 76.29). Therefore the unacceptable difference between these two ceramic systems is mainly due to the colour difference of lithium disilicate ceramics.

**P038**

**Effect of Temperatures on Polymerization Stress and Microleakage of Class V Composite Restorations**

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**Objectives:** This study aimed to investigate contraction-stress of composites at 23, 37 and 60°C, and to measure microleakage in Class V restorations restored with preheated composites.

**Methods:** Maximum contraction-stress of the composites (n = 5) at 23, 37, and 60°C were evaluated using a low-compliance device. The contraction forces were recorded during 15 min. Calculations were done to adjust for the system’s compliance and to obtain shrinkage values of composites. Class V cavities were prepared on the buccal surface of 72 extracted premolar teeth. The teeth were restored with three composites at three temperatures, finished, and stored in distilled water for 24 h before thermocycled between 5 and 55°C for 1000 cycles. The teeth were sealed and placed in 0.5% toluidine-blue dye for 24 h then embedded in self-curing resin and sectioned mesio-distally with a slow-speed diamond saw, providing three sections/restoration. Microleakage was rated by two evaluators using a 0–4 scale at the occlusal and cervical margins under light microscope (40×). The data were analyzed with Kruskal–Wallis ANOVA and Mann–Whitney U-test (α = 0.05).

**Results:** Results indicated that preheating composites to 37 and 60°C significantly increased polymerization stress of composites (p < 0.05). A greater amount of leakage at the cervical margins was found when compared to the occlusal margins (p < 0.05), and preheating composites to 60°C resulted in significantly less microleakage at the cervical margin.

**Conclusion:** Preheating composites significantly increased their polymerization contraction stress. However, preheating composite to 60°C may help reduce microleakage at cervical margin of Class V restorations.

**P039**

**Stress Evaluation of Complete Denture by Electrical Resistance Strain Gage**

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Aim: The purpose of this paper was to evaluate the stress and strain state of maxillary complete dentures loaded in compression until the final fracture.

Material and method: For this study, electrical resistance strain gage were used for evaluation the strain and stress distribution on five maxillary complete dentures made by acrylic resin Triplex. Based on practical observations, the strain gages were applied on the mid-lines of the dentures at the base of incisors and on the sides of the dentures, under molars. The dentures were loaded until failure and on registered the strains in the located strain gages through micro-measurements by Vishay devices.

Results: The Young’s modulus of Triplex was determined by tensile tests at about 3048 MPa. Based on these tests one determined the critical stress and strain in the interest areas, as follows: in median area of dentures, under the incisors, the maximum strain was $e_{\text{max}} = 5984 \mu m/m$ and the tensile stress was $\sigma_{\text{max}} = 18.239$ MPa; on the sides within dentures, under the molars were determined the maximum strain $e_{\text{max}} = 3646 \mu m/m$ and the tensile stress $\sigma_{\text{max}} = 11.11$ MPa.

In all the tests carried out the fracture occurred in the median area of the denture and the crack was initiated between the incisor teeth.

Conclusions: The stress and strain field associated with the crack initiation mode showed a strong influence of geometry on the fracture strength of denture.

The analysis provides a qualitative analysis of the stress field in the denture examined and conducted to a critical stress state of complete dentures.

P040
Measurement Accuracy of a Three-Point Bending Device with Adjustable Specimen-Supporting Parts
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Aim: One common problem found in the flexural testing of dental ceramic bars is edge fracture due to non-parallel surfaces which can lead to the inaccuracy of the measurement. Using modified specimen-supporting parts that can be adjusted to fully attach to the non-parallel surfaces may decrease this inaccuracy. The aim of this study was to determine the measurement accuracy of three-point bending devices using adjustable or fixed specimen-supporting parts.

Material and methods: One hundred and twenty specimen bars were fabricated from VITA VMK 95 body porcelain according to the BS EN ISO 6872 standard. The specimens were ground and polished to produce six groups of 20 with opposing surfaces parallel within 0.00, 0.01, 0.02, 0.03, 0.04 and 0.05 mm. Ten specimens from each group were tested by the apparatus with adjustable specimen-supporting parts, while the others were tested with fixed parts. The flexural strength of the specimens was statistically analyzed by one-way ANOVA and the data reliability was calculated by Weibull analysis.

Results: The mean flexural strengths of the specimens tested with the adjustable was significantly higher than those tested with the fixed parts in all groups ($p < 0.05$). The Weibull modulus of the data generated from the adjustable apparatus was also significantly higher than these from the fixed ($p < 0.05$).

Conclusion: The results of this study indicate that using the three-point bending device with adjustable specimen-supporting parts significantly improves the force distribution at the tensile surface of the specimens and therefore the reliability of the flexural strength data.

P041
Decision Making Between Traumatized Teeth Treatment Options?
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Introduction: Traumatized teeth affected people psychologically and physiologically so the problem must be solved in the most effective solution by satisfying the patient in cited two ways. After trauma traumatized teeth taken into consideration and decision making becomes a complex outcome, as it depends predominantly on decisions taken by dentists and patients especially after traumas. There is two way to follow; one is extracting the teeth, the other is treating existing teeth part. Final decision is mostly depending on the position of the crack observed on the tooth after trauma. If crack effects the pulp, teeth must have root canal treatment first and then must be treated with composite restorations or post-core crown restorations.

Case and conclusion: In this case report we will present two traumatized tooth cases; one scenario ends with extraction and the other ends with post-core crown restoration after endodontic treatment.

P042
The Effect of Glass-Ionomer Containing Various Levels of Titanium-Dioxide Nanoparticles Against Streptococcus mutans
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Purpose: One of the most important topics of recent studies is the use of nanoparticles on the antibacterial properties of dental resins. In this study we added titanium-dioxide nanoparticles to a light-cured glass-ionomer to examine its antibacterial properties against Streptococcus mutans.

Materials and methods: In this in-vitro study the population were divided into five groups of glass ionomer Fuji II LC (GC Corp. Japan) containing, respectively, zero (control), half, one, three and five percent by weight of titanium-dioxide nanoparticles. Fifteen discs (three of each group) of this experimental glass-ionomer were cured inside the same plastic mold for the Disk Diffusion Test. The antibacterial effect against Streptococcus mutans was studied in Chocolate Agar. For Direct Contact Test 15 microtubes containing resin groups (three disks per group) were prepared and the antibacterial effect was examined.
Results: The mean diameter of bacterial inhibition zone around disks containing 0.5% titanium-dioxide nanoparticles was the same as around other disks containing nanoparticles and it was slightly higher than the control group. The direct contact test after 3.6, and 24 h showed fewer number of bacteria on the surface of nanoparticles. There was no difference between the four groups containing nanoparticles. However, reduced bacterial growth was observed compared with the control group.

Conclusion: Samples containing nanoparticles in both tests had antibacterial property.

P044
Nanomechanical Evaluation of Fluoridated PMMA Surface Properties after Fluoride Ion Release
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Aim: To investigate the changes of surface topography of new fluoridated polymethylmethacrylate PMMA denture base material post fluoride ion release in two storage media, considering surface roughness on atomic scale and surface hardness on Nano scale.

Materials and methods: Discs of PMMA uploaded with various percentages of fluoridated glass fillers were prepared (0, 1, 2.5, 5, and 10% by weight) and aged for 3 months in deionised water (n = 5) and in lactic acid (n = 5) with the storage medium discharged and refreshed after each of 15 testing intervals detecting fluoride ion release. Evaluation of surface roughness pre and post storage was performed using atomic force microscope (AFM) in a tapping mode with the Ra measured on the scan of 25 x 25 μm images. Evaluation of the nanohardness of the specimens was carried out using Ultra Micro Indentation System, utilizing a threesided Berkovich indenter tip. One-way analysis of variance was used to assess the influence of storage media and fluoride ion release on both surface properties.

Results: The tested groups showed no significant difference (p > 0.05) in surface roughness and hardness pre and post fluoride ion release over 3 months comparing with the control group in either media. All testing groups presented slight decrease in surface hardness and roughness post fluoride release in both media, excluding the control and 1% resin bases which became rougher in lactic acid.

Conclusion: Fluoride ion release had no negative influence on surface topography and hardness of the denture base material despite its expected rule in enhancing anticariogenic effect.
both monomer-deposited groups were maintained even after thermocycling, although the characteristic strengths of both groups decreased to that of the control group.

Conclusions: The plasma deposition with 1,3-butadiene or benzene enhanced the adhesion of composite resin to the enamel. Although the MSBS decreased after thermocycling, their effect on adhesion durability needs to be investigated in the point of fracture mechanics.

P046
Effect of Beverages Temperature on Physical Properties of a Composite Resin
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Objective: To investigate the effect of beverages' temperature on the surface roughness, hardness, and color stability of a composite resin.

Materials and methods: Fifty specimens of the Filtek Z-250 composite (3M ESPE, Dental Products, Seefeld, Germany) were prepared and initial roughness, microhardness, and color were measured. Then the specimens were randomly divided into five groups of 10 specimens each: coffee at 70°C; coffee at 37°C; cola at 10°C; cola at 37°C; artificial saliva (control). After the samples were submitted to 15 min x 3 cycles per day of exposure to the solutions for 30 days, final measurements were recorded. The data among groups and the changes over time were evaluated by using analysis of variance for repeated measures for the parameters of microhardness, roughness, and color (L, a, b). Multiple comparisons were evaluated by Bonferroni test. Welch-ANOVA test was used to evaluate the differences in ΔE measurements among the groups. Multiple comparisons were evaluated using the Games–Howell test.

Results: After immersion in beverages, the artificial saliva group showed hardness values higher than those of the other groups (p < 0.001), and the microhardness values were significantly different from the initial values in all groups except for the control group. Both cola groups showed roughness values higher than baseline values (p < 0.05), while the other groups showed values similar to baseline measurements. When ΔE measurements were examined, the 70°C-coffee group showed the highest color change among all the groups (p < 0.05).

Conclusion: High temperature solutions can cause alterations in certain properties of composites, such as increased color change, although they did not affect the hardness or roughness of the composite resin material tested.

P047
Quantification of Water-Based Cements Acid Erosion by 3D Microscopy
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Aim: The purpose of this study was to evaluate the acid erosion of commercially available water-based cements according to the method specified in ISO standard 9917-1 and to compare dial gauge measurements with results from 3D microscopy investigations.

Materials and methods: Water-based phosphate and copper ion cements used as filling materials were prepared according to the manufacturer’s instructions and subsequently tested by the ISO standard 9917-1 method. After 24 h of setting at a temperature of 37°C and a relative humidity of at least 90% the specimens were immersed in an eroding solution with a pH of 2.74. Quantification of the resulting depth loss of cement material after 24 h was both examined with a dial gauge and a 3D microscopy setup.

Results: Both recording methods appeared to correlate as no significant differences in terms of material depth loss were observed. As previously reported the force applied by the dial gauge onto the specimen must be carefully controlled as it may influence the depth loss. The 3D microscopy instrument operates in a non-contact mode and circumvents this problem. In addition information about surface defects and voids on the μm scale which can influence as well the results from dial gauge measurements become visible.

Conclusions: Recording of depth loss with 3D microscopy was found to be comparable to the measurements with the dial gauge. The test method using a 3D microscope points out further advantages compared to the mechanical method and seems to be suitable as a reliable alternative.

P048
Effect of an Anti-Oxidant on Cytotoxicity of Dentin Bonding Agents
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Objective: The aim of this study was to evaluate the cytotoxicity of different dentin bonding agents on mouse fibroblast (L-929) cells and to determine the effect of an anti-oxidant agent on cell viability.

Materials and methods: Four different dentin bonding agents (Group A: G-aenial Bond-GC, Group B: Optibond All in One-Kerr, Group C: Gluma Self Etch-Heraeus and Group D: Clearfil S3 Bond-Kuraray) with three different concentrations (1:1, 1:10 and 1:20) were added to the culture medium using extract method. The cells were cultured with or without an anti-oxidant (Resveratrol) addition. The dose-depended response of cells against

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Resveratrol (R) was investigated. Cell survival was measured by MTT after 1 and 24 h. The data were analyzed statistically with one-way ANOVA and two-way ANOVA respectively.

Results: The most effective dose of Resveratrol that significantly increased the cell viability was found to be 0.5 μM (p < 0.05). All tested bonding agents had a dose-dependent (1:1 > 1:10 > 1:20) cytotoxic effect. The strongest cytotoxic effect was determined in Group C (p < 0.01). Considering the 1:10 concentration; Group D at 1 h (p < 0.01) and Group B and Group D at 24 h had the weakest cytotoxic effect (p < 0.05). After Resveratrol addition, the highest cell viability was determined in Group B + R and Group D + R at 1 h. Group A + R and Group B + R had the highest cell viability at 24 h (p < 0.01).

Conclusion: Regarding the results of this preliminary study, the cytotoxicity of bonding agents may be decreased by addition of 0.5 μM Resveratrol.

P049
An Investigation of Biological Properties of Acrylic Resin Copolymers
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Purpose: Aim of this study was to assess the cytotoxicity of variety copolymer acrylic resins that evaluated physical properties previously.

Materials and methods: Specimens of copolymer test groups were prepared by adding volumetric percent of 10–20–30–40 of ethyl, butyl and isobutyl methacrylate monomers in conventional heat cured acrylic resin monomer. Test specimens divided into 13 groups that including the control group. Five specimens of each resin were fabricated 10 mm in diameter by 1 mm thick. Eluates were prepared by placing five discs into a sterile glass vial with Dulbecco’s Modified Eagle’s medium and incubating at 37°C for 24 and 48 h. The cytotoxic effect from the eluates was evaluated on L929 cells using the MTT assay. The results were assessed statistically.

Results: Statistical significance was determined by one-way ANOVA. The result of ANOVA indicated that there was a statistically significant difference between acrylic resins in terms of cytotoxicity for 24 and 48 h (p < 0.01). Also there was statistically significant interaction between times and groups.

Conclusion: There was a statistically significant difference between acrylic resins in terms of cytotoxicity for 24 and 48 h. However, the values of cytotoxicity of all groups for 24 and 48 h were within acceptable limits clinically. For all copolymer groups, values of cell viability for 48 h decreased by increasing the volume of the monomer in the copolymer. When cell viability compared for 24 and 48 h, values of cell viability increased at 48 h in general.

P050
Comparison of Microleakage of Four Self-Adhesive Resin Cements
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Aim: The aim of this study was to compare the microleakage of four self adhesive resin cements used for fiber post cementation with fluid filtration method.

Materials and methods: In the study, 50 upper human canine teeth extracted for periodontal reasons were used. The root lengths of the teeth were standardized. Root canals were enlarged with rotary instruments (Protaper, Dentsply Maillefer, Ballaques, Switzerland) and filling was achieved using lateral compaction technique. The specimens were randomly assigned to five groups (n = 10). The fiber post (Exacto Glass Fiber posts, Angelus Industria de Produtos Odontologicos S/A, Londrina-PR-Brasil) cementsations are completed with the materials below:

(1) Group 1: Variolink II Professional Pack (Ivoclar Vivadent, Liechtenstein) (Control)
(2) Group 2: G-Cem Automix (GC, Tokyo, Japan)
(3) Group 3: Panavia SA Cement (Kuraray, Okayama, Japan)
(4) Group 4: Smart Cem 2 (Dentsply DeTrey GmbH, Konstanz, Germany)
(5) Group 5: Rely X U200 (3M ESPE, Neuss, Germany)

The measurement of microleakage was performed at 2nd, 4th, 6th and 8th minutes.

The data was analyzed by univariate analysis of variance and Tukey tests (p < 0.05).

Results: The best results were obtained in group 3 and 5, while the most leakage was seen in group 2 and 4. There was statistically significant difference between Rely X U200 and Panavia SA Cement groups compared to the control group.

Conclusion: From the point of microleakage, some self adhesive resin cements used for fiber post cementation were found to be more reliable than the control group material.

P051
Polymerization of Dual-Cure Resin Cements under Zirconia with Two Different Light Curing Units
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Purpose: Adequate polymerization is a crucial factor in obtaining optimal physical properties and a satisfying clinical performance of composite resin materials, however it depends on several factors including the ceramic system, luting agent, curing light characteristics, and curing regimen. The aim of this study was to evaluate the curing efficiency of resin cement used under zirconia structures with two different light curing units.

Material and methods: Four disc samples with four different thicknesses representing the zirconia substructures were prepared 4.0 mm in diameter using CAD/CAM system and layered with feldspathic porcelain. The resin cement was light cured using two
different light curing units (LED: Light Emitting Diode and QTH: Quartz-Tungsten Halogen). The values of depth of cure (mm) and the Vickers Hardness values (VHN) were evaluated for each specimen. Statistical analysis was performed using One-way ANOVA, Tukey’s HSD, and Student’s t-tests (p < 0.05).

**Results:** The use of LED unit produced a greater depth of cure compared to QTH under ceramic discs with 0.5 and 1.0 mm thickness. At 1.0 and 2.0 mm depth, the LED unit produced significantly greater VHN values compared to the QTH unit. At 3.0 mm depth, the difference between the VHN values of LED and QTH groups were not statistically significant.

**Conclusions:** Light curing may not result in desired resin cement polymerization under thick zirconia structures. Using LED light sources should be preferred rather than QTH for curing dual-cure resin cements especially under thicker zirconia restorations.

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**P052**

**Temperature Rise During Polymerization of Light-Cured Pulp-Capping Materials with Different Modes**

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**Aim:** Pulp damage may occur because of the temperature rise during polymerization of light-cured dental materials. The purpose of this study was to evaluate three different curing modes of a light-emitting diode (LED) on the temperature rise in the pulp chamber during polymerization of a light-cured resin-modified calcium silicate filled pulp-capping material.

**Material and methods:** A straight-cut was made to the occlusal surface of an extracted molar ensuring 1 mm dentin thickness over the pulp. Pulpal circulation was simulated by water circulation through the pulp chamber with a defined flow pressure to simulate the clinical case. Temperature rise was measured during the light curing of capping material (Theracal, Bisco Inc., USA). Three modes of light curing unit (Planmeca Lumion, Mectron, Italy) were used to polymerize the material; fast (FP), slow rise (SRP) and soft (SP). Thermal changes were measured with J-type thermocouple and recorded by a data-logger. The data were statistically analyzed by one-way ANOVA.

**Results:** ANOVA test showed that pulp chamber temperature changes were influenced by the mode of light source. All groups showed significant differences between each other (p < 0.05). The intrapulpal temperature changes induced by different modes were: (7.19 ± 0.44°C) for FP, (6.62 ± 0.34°C) for SRP, (6.10 ± 0.37°C) for SP.

**Conclusions:** Following conclusions were drawn; The intrapulpal temperature changes induced by various light modes were; FP, SRP and SP in descending order. All curing modes of light curing unit showed significant differences between each other. Light curing of the Theracal with different polymerization modes of the same light unit resulted in more than 5.5°C increase in the pulp chamber.
adhesive system, composite cylinders were placed to dentin using Tygon tubes with an inner diameter of 0.90 mm. However self-adhering flowable composite was used without adhesive application. The µSBS of samples were determined using a Universal testing machine. Data obtained were analyzed with one-way ANOVA followed by Tukey test (α = 0.05).

Results: G-ænial and Vertise Flow presented higher µSBS than the others (p < 0.05). However the µSBS of Single Bond + G-ænial was not significantly different from that of Vertise Flow (p > 0.05). Additionally the µSBS of Single Bond + Filtek Ultimate was the lowest (p < 0.05).

Conclusions: Within the limitation of this study, it was concluded that self-adhering flowable composite in dentin depicted a comparable performance to those of other flowable composite resins used with a self-etching adhesive system. The performance of a self-etching adhesive system may be affected by the quality of the flowable composites.

P055
An In-Vitro Comparison of the Bond Strength of FRC Posts to Radicular Dentin Using Different Adhesive Cements
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In this research we decided to evaluate the bond strength of FRC posts to endodontically treated teeth with different adhesive cements.

Material and methods: Forty-four caries-free, single-rooted human premolars, were selected for this study. The crown of each teeth was removed 2 mm below the CEJ and the roots were endodontically treated then prepared for post cementation. Then they divided into four groups, according to the adhesive cement type: group 1: Breeze (self-adhesive), group 2: ED Primer II/Panavia F2 (self-etch), group 3: Prime & Bond NT/all-Cem (etch & rinse), group 4: GC Fuji plus cement.

Each specimen was cut in to 2 mm thick section from middle third of root and push-out bond strength test was performed in each section at a cross-head speed of 0.5 mm/min. Data was analyzed with one-way ANOVA and a post hoc test.

Results and conclusion: The interfacial bond strength was different among the four groups.

GC Fuji plus obtain the highest bond strength values, this result indicate that the chemical interactions between the adhesive cement and hydroxyapatite may be important for root dentin bonding. Breeze (self-adhesive resin cement) without any pretreatment procedure can not obtain the acceptable bond strength.

P057
Effect of Hydrochloric Acid on Surface Properties of Restorative Materials
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Purpose: The purpose of this study was to evaluate the effect of hydrochloric acid on wear rates and surface hardness of six different tooth-coloured restorative materials

Material and method: Conventional glass ionomer (Fuji IX GP), resin-modified glass ionomer (Fuji II LC Improved), compomer (Compoglass F), hybrid composite (Aelite LS Posterior), microhybrid composite (Gradia Direct) and nanohybrid composite (IPS Empress Direct) were tested in a pin-on-disk design wear machine at 20 N load. Each specimen was subjected to 10,000 cycles under two different solutions (artificial saliva, pH 7; hydrochloric acid, pH 2.6). Amount of material loss were evaluated by profilometer.

For the hardness test restorative materials immersed in distilled water, artificial saliva and hydrochloric acid. Measurement of surface microhardness were carried out using a hardness tester under 500 g load for 20 s. The statistical analyses were performed by One-way ANOVA test, Tukey HDS test, Student t-test and paired sample t-test.
Results: Hybrid composite, demonstrated the highest hardness values and the lowest wear loss (p < 0.01). Compomer and composites at artificial saliva showed significantly higher wear loss than hydrochloric acid solution (p < 0.01). Conventional glass ionomer, resin modified glass ionomer, hybrid composite and nanohybrid composite at hydrochloric acid solution, exhibited significantly lower hardness than at distilled water and artificial saliva (p < 0.01).

Conclusion: The results of this study suggested that making restorations by using glass ionomer cement and resin-modified glass ionomer cement should be avoided from patient with reflux problems. In such cases, composite resins would be more suitable and reliable.

P058
Evaluation of Dynamic Viscoelasticity of Tissue Conditioners with Surface Coating Agents
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Aim: The application of a surface coating agent on the tissue conditioner has been reported to increase the intra-oral use of the tissue-conditioners. This in vitro study evaluated the dynamic viscoelastic properties of the tissue-conditioning materials with surface-coating agents.

Materials and methods: Specimens of tissue-conditioning materials (20 mm diameter × 10 mm thickness) (Coe-Comfort-C, F.I.T.T.-F and Visco-gel-V) was mixed in accordance with the manufacturers’ recommendations (C, F, V) and with altered powder/liquid ratios (C’,F’V’) (n = 144). Surface coating materials (Monopoly-M, Palaseal-P) was applied onto the surface of the specimens. The shear storage modulus (G’), shear loss modulus (G”) and loss tangent (tanδ) were measured using a magnetic rheometer after a gelation time of 2 h, 1, 3, 7, 14, 21 and 28 days of immersion. Data were analyzed by using Kolmogorov-Smirnov, Kruskal-Wallis and Mann-Whitney U-tests (p ≤ 0.05).

Results: For all the time periods tested, G’ and G” values of FM, FM, VM and V’M groups were lower than F, F’, V and V’. Higher G’ and G” and lower tanδ values of C’ and V” than those of C and V groups were detected; while lower G’ and G” and higher tanδ values of F’ than those of F groups were detected. Palaseal surface coating material did not affect the viscoelasticity of the all samples tested while Monopoly surface coating affected the dynamic viscoelasticity of tissue-conditioners mixed with altered powder/liquid ratios.

Conclusion: The application of surface coating agents on the tissue-conditioners might be advantageous to increase the viscoelastic properties and cushioning effect of these materials.

Theme: Dental Treatment & Restorative Dentistry: Periodontics

P059
Clinical and Histological Evaluation of Primary Second Molar with Caries
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Aim: Managing dental caries in young children is demanding due to the elusions present on the right diagnostic criteria for treatment. The present study evaluated the histological status of pulp tissues extracted from primary second molar with caries involvement. Histological findings are correlated with clinical and radiographic assessment.

Materials and methods: Simple experimental study was conducted with ethical approval on upper or lower second primary molars with occlusal (22 teeth) or proximal (22 teeth) dental caries. Selected children were below 6 years of age. Percentage of caries involvement, residual dentin thickness (RDT), radiographic assessment of interradicular and periapical areas, clinical caries depth and signs and symptoms are the parameters considered for comparing histological findings. The specimens were grouped based on nature of inflammatory process as acute or chronic. The data were analyzed by student t-test to compare histological types of inflammation with clinical parameters.

Results: Four cases revealed severe acute inflammation in coronal and relatively mild acute inflammation in radicular pulp. In rest of the specimen coronal and radicular pulp had similar acute or chronic inflammatory changes. Histological evidence of pulps correlated with dental caries depth of ≥80%, RDT of ≤1 mm, radiographic rarefactions in the interradicular regions and symptoms of pain.

Conclusions: Primary second molars with more than two third caries involvement with symptoms of pain histologically showed inflammation of both coronal and radicular pulp tissues in all cases.

P060
Assessments of Dental Fear in Children by Using the Frankl Behaviour Rating Scale and Sound Eye Motor Scale
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Aim: To compare dental fear (DF) in children who practiced the tell-show-do technique with those did not by using the Frankl Behaviour Rating Scale (FS) and Sound Eye Motor Scale (SEM) at the patients’ first meeting with the dentist.

Materials and methods: The 532 subjects admitted and examined at the department of pediatric dentistry were assessed. Children with physical and mental health problems (mental retardation, psychotic disorders, severe sensory motor impairment), toothache (pulpitis, pericoronitis), and a history of dental treatment were excluded from the study. Thus, a total of 85 children (47 male, 38
female) matched the inclusion criteria and participated in this randomized controlled clinical study. The study protocol was approved by the Research Ethics Committee, and informed consent was obtained from the parents of all children. All dental treatments and the tell-show-do technique were applied by one calibrated examiner, and the FS and SEM were applied by an independent calibrated examiner. All subjects received restorative therapy after local anesthesia in the first therapeutic session. For the statistical analysis and calculations SPSS for Win (SPSS, Ver. 15.0, Chicago, IL, USA) was used. In statistical decisions, \( p < 0.05 \) values were accepted as an indicator of significant difference.

**Results:** The children who did not perform the tell-show-do technique showed higher levels of DF than those who did; however, there were no differences in DF results between the two scales.

**Conclusion:** The tell-show-do technique, which is a behavioral management technique, should be preferred over pharmacological techniques in children with DF during dental treatment.

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**P061**

**The Effect of Magnetic Resonance Imaging on Microleakage of Amalgam Restorations**

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**Aim:** To compare the effect of magnetic resonance imaging (MRI) on microleakage of class II amalgam restorations.

**Materials and methods:** A total of 40 human extracted, caries-free third molars were used in this study. Class II cavities were prepared using diamond burs under water cooling and were randomly divided into four groups (n = 10). The first and second groups comprised molars with cavities that were restored with dentin adhesive and amalgam, whereas the third and fourth groups comprised molars with only amalgam-restored cavities. The amalgams were placed incrementally with the condensing towards the cavity walls. The finishing and polishing procedures were completed. MRI was applied to the teeth in the first and third groups for approximately 20 min. The specimens were thermocycled at temperatures between 5 and 55°C with a 30-s dwell time for 1000 cycles. The samples were then immersed in 0.5% Methylene blue dye for 24 h and sectioned longitudinally. Dye penetration at the occlusal and gingival margins was quantified using a stereomicroscope at 15× magnification. For the statistical analysis and calculations SPSS for Win (SPSS, Ver. 15.0, Chicago, IL, USA) was used. In statistical decisions, \( p < 0.05 \) values were accepted as an indicator of significant difference.

**Results:** The groups that were not subjected to MRI showed less microleakage than those that were; however, there were no differences between the bonded amalgam and amalgam groups.

**Conclusion:** The results of this study suggest that MRI can increase microleakage of amalgam restorations.

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**P062**

**Conservative Treatment of Dentigerous Cyst Associated with Primary Teeth**

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**Background:** Dentigerous cysts are the most common bony lesions of the jaws in children. They are associated with the crowns of permanent teeth, most frequently impacted mandibular third molars, maxillary canines, maxillary third molars, and rarely, supernumerary teeth. Radiographically, the cyst appears as ovoid well-demarcated unilocular radiolucency with a sclerotic border.

**Case:** The purpose of the present case was to report 7 year-old boy with a dentigerous cyst associated with unerupted mandibular second premolar tooth and its dental management. The patient referred to our department with a chief complaint of painless swelling on right side of the mandible. On the extraoral examination facial asymmetry was noted on the right side. The radiographic and 3D-CT examination showed thick sclerotic border surrounding the large, well-defined unilocular radiolucent lesion with 22.5 mm in diameter. Primary first and second molar teeth were necrotic and showed large loss of bone in the bifurcation area. Case management: Marsupialization of the cyst was chosen as the treatment of choice. The treatment consisted of extraction of necrotic first and second primary molars and created a window through the extracted socket to decompress the lesion under local anesthesia. An epithelial tissue sample from the cyst was collected. Histopathological diagnosis was inflamed odontogenic cyst. After 18 months, bone formation was observed in the same region and mandibular right second premolar was seen erupting in its proper place.

**Conclusion:** Careful evaluation of the history, the clinical and radiographical findings help clinicians to diagnose the condition correctly, identify the etiological factors, and administer the appropriate conservative treatment instead of serious surgery.

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**P063**

**The Effect of Mumps on Primary Teeth: A Case Report**

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**Aim:** The aim of this study was to expose the enamel defects and their treatment of the second primary molar of a 6-year-old patient who suffered from mumps when he was 4 months.

**Case report:** In the oral examination of a 6-year old patient referred to our clinic with toothache, it was detected cavities penetrated into the dentine on all his second primary molars along with softening in the enamel of the teeth without deformation. However, it was not located any decays on the other teeth. In his anamnesis, it was ascertained that the patient had mumps when he was 4 months. Before starting his treatment, a radiographic
examination of the teeth is carried out through OPG. The decayed portions of the teeth numbers 55, 65, and 85 are removed and a root canal treatment was performed on the tooth number 75. All the second primary molars were covered by stainless steel crown. The changes in the patient has been followed in 6-month time periods.

**Conclusion:** The enamel formation of the second primary molar generally initiates during the fifth month of intrauterine life and terminates at the tenth month after the birth. Because experiencing skin eruption and inflammatory diseases during this period effects directly ameloblast activities in a negative way, enamel hypoplasia occurs. Due to the fact that they have the best impermeability, keep their original form and size of primary teeth and become more retainable, these teeth are treated with stainless steel crown.

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**P064**

**Postoperative Complications Following Dental Treatment under General Anesthesia in Pediatric Patients**

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**Aim:** The aim of this study was to investigate postoperative complications following dental treatment under general anesthesia in pediatric patients over a year period.

**Method:** One hundred and thirty-three healthy pediatric patients (age range 2–9 years) were referred for dental treatment under general anesthesia. The study was approved by the ethical committee at the Faculty of Medicine, Kirikkale University in Turkey. Data were obtained by history taking, clinical examination, pre-formed questionnaire and standardized data records. During the general anesthesia procedure, a mean number of 8.1 (±3.3) teeth were filled, 1.3 (±1.4) teeth were treated endodontically and 2.6 (±2.4) teeth were extracted. Post-operative complications were assessed through telephone calls to the patient’s mother/guardian by the investigator, after the first day (after 24 h) and after the third day (after 72 h). Results showed that 69.9% of the children had one or more complaints after 24 h in contrast to only 35.3% after 72 h. Cough and pain (27.1%), inability to eat (24.8%), psychological changes (24.1%), sore throat (21.1%), were more common complaints in the first day, followed by drowsiness (17.3%), bleeding (16.5%), fever (15.8%), sleepiness (15%), nausea (12%) and vomiting (9.8%). A significant reduction in complaints was reported after 72 h (p < 0.05).

**Conclusion:** Post-operative complaints were common 24 h after dental treatment under general anesthesia. However complaints were mild in severity and limited to the first day.

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**P065**

**Clinical Research on Restoration of Bone Defect in Cleft Alveolar with β-Tricalcium Phosphate**

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**Objective:** To evaluate the feasibility of using β-tricalcium phosphate (β-TCP) to repair bone defects of patients with alveolar cleft. To search for ideal artificial material as a substitution of autogenous iliac cancellous bone to repair alveolar cleft.

**Materials and methods:** Twenty-four patients with alveolar cleft were chosen from oral and maxillofacial department of Beijing stomatological hospital. They were divided into two groups: group A (10 cases) and group B (14 cases). In group A, autogenous iliac cancellous bone was transplanted to repair alveolar cleft, and in group B, β-TCP was transplanted. Observe the coalesced condition of the both groups 1 week after the operation. Compare the formation of the new bone between the two groups through the images of cone beam computer tomography (CBCT) and three-dimensional reconstruction taking pre-operation and 4–6 months post-operation.

**Results:** All the 24 patients achieved well primary-healing without infection, dehiscence or rejection 1 week post-operation except one case in Group A. CBCT and three-dimensional reconstruction 4–6 months after operation showed new bone formations and the succession of alveolar being well or partly recovered. The clinical success rate is the same in both groups.

**Conclusion:** There is no significant difference in the formation of the new bone between β-TCP and autogenous iliac cancellous bone. As an ideal artificial material, β-TCP can be used to repair the bone defect of alveolar cleft in the patients with cleft lip and palate.

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**P066**

**Polymicrotrauma**

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**Introduction:** Nail-biting is one of the most common but unresolved oral habits among children and important concern for paediatricians and paediatric dentists. Nail-biting may damage the structure of the mouth and can enable easier spread of infectious diseases. Beside all these damages chronically nail-biting, repetitive trauma might also cause the dental pulp to become inflamed.

**Case:** The presented case was 10-year-old boy in mixed dentition referred for emergency treatment with complaint of pain. There was no reported history of orofacial trauma. Through extra-oral examination was noted that lower lip and chip were swollen.

The mandibular left incisor did not present any carious lesion or fracture. However, the tooth was sensitive to percussion, showed abnormal colour, increased mobility and responded abnormally to thermal pulp tests. The periapical radiograph did show enlargement of the periodontal space. After being diagnosed as advanced irreversible pulpitis, root canal treatment was carried out; adequate healing was manifested clinically by resolution of symptoms and radiographically by bone filling in the radiolucent
area at the root apex over a period of 10 months. According to the medical history has a habit of nail-biting for 5.5 years.

**Conclusion:** This unusual case report gives important information about examination of oral habits in children and emergency cases. Many studies noted that nail-biting may play a significant role in the development of some anomalies of the oral-facial system or may cause damage of the cuticles and secondary bacterial infection. After treatment the patient quitted this bad habit.

P067

**Conservative Approach for Missing Single Tooth in Adolescence:**

**Case Study with 1 year Follow Up**

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**Purpose:** The purpose of this study was to rehabilitate the single missing tooth due to the trauma of an adolescent with the minimal invasive approach using a direct Fiber Reinforced Composite Dental Bridge.

**Materials and method:** Due to the trauma history, one single tooth was missing in the maxillary anterior region in three patients who were 11–13 years old. In these years of adolescence, they are mostly worried about their appearance. Patients were temporarily treated by fiber reinforced adhesive bridges. No preparations were done on the lingual surfaces of the abutment teeth. Because of their development period, we used only one abutment tooth to allow for the growth of the maxillary. The patients were recalled for examinations every 6 months to evaluate the restorations and their consistence.

**Results:** After a 1 year clinical follow-up, all three fiber reinforced adhesive bridges were intact and no signs of fracture, debonding or discoloration was observed. Patients were happy with their appearance. Restoring a missing single central incisor is one of the most difficult esthetic procedures in dentistry especially during the developmental period. For the ongoing growth of young patients it is hard to replace the tooth with implants or using removable appliances. This alternative treatment approach may be successfully used for temporary treatment of incisor tooth loss.

P068

**Oral Manifestations of Hypophosphatemic Rickets: A Case Report**

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**Background:** Hypophosphatemic Rickets is an inherited disease characterized by renal phosphate loss, growth retardation and defects in bone mineralization. Patients present clinically skeletal deformities and oral manifestations including pulpal infections and dental abscesses due to defective dentin which occurs as a result of hypophosphatemia. We present oral manifestations and dental treatment of a hypophosphatemic rickets case as established by the combination of clinical, radiographic findings and laboratory values.

**Case:** A 7 year-old boy diagnosed with hypophosphatemic rickets was referred to Yeditepe University, Faculty of Dentistry, Department of Pediatric Dentistry with the chief complaint of toothache. Physical examination showed markedly curved legs and short stature. Intraoral examination revealed pulpal infections and abscess formation in the primary molars and premature loss of upper incisors. The radiographic findings were enlarged pulp chambers and root canals related to defective dentin. Following consultation with a pediatric endocrinologist, dental treatments including extractions and restoration of primary teeth were performed under general anesthesia due to the inadequate cooperation. The immediate prosthetic rehabilitation was carried out 4 weeks later and after 3 months dentures were renewed according to the changes in the mouth. Oral health care advises have been provided and the patient is under follow up at regular intervals for preventive measures.

**Conclusion:** Patients with hypophosphatemic rickets may frequently present dental abnormalities. Dentists and pediatricians should be aware of the features of this disorder and periodic oral examinations and preventive measures should be performed because early intervention could prevent more invasive dental procedures.

P069

**Hallermann-Streiff Syndrome: A Case Report**

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**Aim:** Hallermann-Streiff syndrome also known as occulo-mandibulo-dyscephaly is a rare congenital disorder characterized primarily by head and face abnormalities. Dental abnormalities are seen in 50–80% of the cases including neonatal and supernumerary teeth, agenesis of permanent teeth, enamel hypoplasia, open bite, malocclusion and hypodontia. The aim of this case report is to present general clinical features of this syndrome and the dental management of a patient with Hallermann-Streiff syndrome.

**Case:** A 2, 5-year-old girl was referred to the pediatric dental clinic with a chief complaint of delayed teeth eruption. Extraoral examination revealed a beak-shaped nose, sparse hair, eyelashes and eyelids, congenital cataracts, parietal and frontal bossing, microstomia, hypoplastic mandible and skin atrophy. Intraoral examination showed that primary teeth eruption was not concordant with her age. The upper right and lower both cuspid with lower right first premolar primary teeth were not erupted. Also her upper incisors had caries. So prophylactic and restorative treatments were planned.

**Conclusion:** Due to the findings of this syndrome; an interdisciplinary approach including early preventive care program, detailed oral hygiene motivation, dietary recommendations and counseling of the parents were initiated. Because of the multiple skeletal and dental problems of this patient; the premature loss of primary teeth with the congenital absence of several permanent teeth will result in functional as well as esthetic problems. Hence, the patient must be included in a strong prevention program as early as possible.
P070

Relationship Between Craniofacial Morphology and Sleep Bruxism in Adolescents
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Introduction: Sleep bruxism is a stereotypical movement disorder characterized by grinding or clenching of the teeth during sleep. A change in orofacial muscles function was first reflected electromyographically and in bruxism masseter and internal pterygoid muscles by their action directly influence the amount and direction of growth of gonial process. The aim of this study was to determine whether a relationship existed between the craniofacial morphologies and presence of bruxism in adolescent.

Material and methods: The sample group comprised thirty-four 13–16 years old children of both genders with complete permanent dentition. Bruxism was evaluated by a structured questionnaire on clinical signs/symptoms and a bite strip (BiteStrip®, S.L.P. Ltd, Israel). It is a single use small disposable electronic electromyographic device designed as a front line screener for bruxism. According to the Bite-Strip scores among the participants were: Group 1 (n: 10): No bruxism. Group 2 (n: 7): 1: mild. Group 3 (n: 8): 2: moderate. Group 4 (n: 9): 3: severe. Craniofacial measurements were obtained from lateral cephalograms by same examiner. Kolmogorov-Smirnov’s one-sample test for testing the distribution of the variables for normality and ANOVA and post hoc tests was performed to analysis of differences between bruxism and cephalometric measurements.

Results: This study found no statistical significant differences in the craniofacial morphologies of bruxers and non-bruxers, except for difference in Sella-Basion. This measure was significantly increased in Bruxers.

Conclusion: The results of this study showed that except for Sella-Basion, craniofacial morphologies were not found to be related to bruxism in adolescents.

P071

Two Different Therapeutic Approaches to Ranulas
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Introduction: The term ranula is used to describe mucocles occurring on the floor of the mouth. Ranulas develop from extravasation of mucous after trauma to the sublingual gland or obstruction of the ducts. In the treatment of ranula, which may be seen in almost all ages beginning childhood, have been reported including aspiration of mucus, marsupialization, excision of the ranula alone or with sublingual gland and cryosurgery.

Case: In this case report we explained that two different therapeutic approaches to intraoral ranulas. An 8 years-old and a 12 years-old boys reported discomfort with swallowing. On physical examinations, diagnosed as ranula that there was a soft, nontender fluctuant mass on the floor of the mouths. The ranula seen in the first case, we learned that occurred when he started using a removable space maintainer. The ranula of the first case was aspirated mucus and recovered spontaneously shortly after the space maintainer was disused. The ranula of the second case was observed during the presurgical period but spontaneous resolution was not detected and then the ranula excised with salivary gland duct under local anesthesia. Both of them, histopathological examination revealed that ranulas consisted of central cystic space containing mucin. No recurrence has been observed after 6 months of follow-up.

Conclusion: Excision of the ranula alone or with sublingual gland, commonly performed, is a successful method of treatment. If the cause of trauma eliminated, conservative treatment with spontaneous resolution may be another option for pediatric population.

P072

Identification of the Mandibular Landmarks in a Pediatric Population
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Aim: The aim of this study was to determine and compare reliabilities of common mandibular landmarks and to determine the incidence of incisive canal, anterior looping and lingual foramen in children from panoramic and CBCT images.

Material and methods: Panoramic and CBCT images from 100 children and adolescent patients were randomly selected. In order to grade the visibility of mandibular anatomical landmarks, a four-point rating scale was used.

Results: In panoramic images; the mandibular canal could be observed in 92.5% of the cases, with a good visibility in 12.0% of the cases. The mental foramen could be observed in 44.5% of the cases while good visibility was not seen. Anterior looping of the mental nerve was present in 16.5% of the cases while good visibility was not seen in any case. An incisive canal could be identified in 22.5% of the cases, with only 1.5% showing good visibility. The lingual foramen could be visualized in 61.0% of the cases, with good visibility in 6%. In CBCT images; the mandibular canal, the mental foramen and the lingual foramen could be observed in 100% of the cases, with a good visibility in 51.0%, 98.5% and 45.0% of the cases, respectively. Anterior looping of the mental nerve was present in 26% of the cases, with 2% having good visibility. An incisive canal could be identified in 49.5% of the cases, with only 7.5% showing good visibility.

Conclusions: This study confirms the applicability of CBCT images for visualization of critical structures in children.
P073
Microleakage of Self-Adhering Material in Primary Teeth after ART
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Aim: The aim of the present study was to compare the performance of materials suitable for ART with regard to microleakage in class II restorations of primary molars in an in vitro conditions.

Materials and methods: In this study it was carried out to compare the microleakage of a flowable composite (Vertice™ Flow, Bisco, USA), an injectable resin modified glass-ionomer (Equa, GC, Japan) and conventional glass-ionomer (Ionomil, Voco, Germany) on 33 carious primary molars. Teeth were divided into three groups (n = 11). The specimen preparation procedures were performed by the same operator. The teeth were subjected to thermally cycled (between 50 and 550°C, 1000 cycle) and stained with 0.5% basic-fuchsin solution. Then the teeth were sectioned in bucco-lingual direction to examine dye penetration under stereomicroscope.

Statistical analysis were performed with SPSS for Windows 15.0. Kruskal–Wallis and Mann–Whitney U-test with Bonferroni correction were used both for occlusal and gingival scores (p < 0.017).

Results: No significant differences were found among the groups regarding gingival scores (p > 0.017). Except for the other pairwise comparisons, significant differences were only found between conventional and injectable resin modified glass-ionomer (p < 0.017) in terms of occlusal scores. However, no significant difference was observed when self-adhering flowable composite was compared to conventional and injectable resin modified glass-ionomer cement (p > 0.017).

Conclusions: This study concludes that flowable composite materials can be used like conventional glass ionomer for ART of the primary teeth but it does not effect the long-lasting time with regard to leakage.

P074
Do Children Always Prefer Colorful Things?
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Aim: Doing known and/or preferred activities affects performance positively. Also person’s choice which he/she preferred provides more positive interaction between who gives that opportunity to him/her. While determining of children’s consumption habits, according to perception levels and age of children, color, content and design of the products are all taken into consideration. It is thought that children like colorful things. The aims of this study were to determine if children really curious about trying colorful things and choice priority of children in between the colored mouth rinsing liquids during a dental treatment session (DTS).

Material and methods: Totally 263 children (ages 3–15 year old; mean age: 8.62 ± 2.48; 122 female, 141 male) assessed in this study. Three transparent cups filled with water, green and pink rinsing solutions and aligned near dental unit. During DTS, child was told to rinse his/her mouth with one of the cups whichever he wants. The preferred color of cups, gender, age and number of sessions were recorded. All data were statistically analysed by SPSS 15.0 programme and chi-square tests.

Results: Children preferred water 62.7%, pink 21.7%, and green liquid 15.6%. Only eight children tried three of the cups in one DTS. Girls chose pink and boys chose green liquid but this difference was not statistically significant. Children attended DTS one time 74.5%; twice 22.4%; three times 3% in the study.

Conclusion: Neither ages and gender nor number of attending DTS affected children’s preference. Water was the mostly chosen rinsing liquid. Children do not wonder about colorful things in a DTS.

P075
Revascularization of Immature Incisors after Dental Injuries: Two Cases Report
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Introduction: Intrusive luxation in the permanent dentition is an uncommon injury but it is considered one of the most severe types of dental trauma because of the risk for damage to the periodontal ligament, pulp and alveolar bone. Effect of regenerative procedures based on the type of tooth injury, fracture type, presence of necrosis or infection, periodontal status, presence of periapical lesions, stage of tooth development, vitality status, patient age, and patient health status will be reviewed.

Case: In this case report; a 6-year-old male presented with trauma to the permanent maxillary central incisors. Upon clinical and radiographic examination, the left central incisor had open apex and intrusion degree was more than 7 mm. Right central incisor had open apex and subluxation injury. The teeth were treated via a revascularization protocol using sodium hypochlorite irrigation followed by spontaneous repositioning then expected to make the source of bleeding clot formation. When occurred of bleeding clot formation a coronal seal of mineral trioxide aggregate and resin composite. Revascularization therapy was performed over multiple visits. Fourteen months after treatment right incisors root development appeared complete and dentinal wall thickening was noted, particularly in the roots apical third. However, revascularization of left incisor which had intrusion injuries, the prognosis has been quite poor and still being followed.

Conclusion: Although, follow-up observations confirmed the efficacy of the regenerative treatment as a viable alternative to conventional apexification in endodontically involved, subluxation injury, this treatment approach might show undesirable results for some of luxation injury such as intrusive cases.
Iatrogenic Dentistry in Kosovo Population
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Aim: The aim of this study was to examine the prevalence of incorrect dental fillings and dental crowns and to determine the influence of iatrogenic dentistry in marginal periodontium on Kosovo residents.

Material and methods: In this study were examined 2012 individuals from six Kosovo locations, with mean age of 31.61 years. 44.3% of them were females and 55.7% males. Presence of incorrect dental fillings and crowns was determined with dental examination and retro alveolar x-rays. Examined persons were divided in ten age groups. Periodontal damages were evaluated with CPITN index. Adequate methods of medical statistics were used for data processing.

Results: Prevalence of incorrect dental fillings (second and fifth Black’s class) was recorded at 581 individuals (28.9%), whereas incorrect crowns at 117 examined persons (5.8%). Bad fillings were recorded more often at females, while bad crowns were frequently recorded at males. It is obviously that incorrect fillings or crowns, causes more damages of supporting teeth structures. There is positive visible link between incorrect fillings and crowns and periodontal damages at males (p < 0.02) and females (p < 0.05).

Conclusions: Iatrogenic dentistry has an accessory role in development of periodontal disease. It allows accumulation of microbial plaque and additional progression of periodontal disease. A high prevalence of iatrogenic dentistry was recorded in this study. Periodontal conditions in presence of incorrect dental fillings and crowns were significantly worse. In fact these results were founded just for some age groups, not for all of them.

Methods: Two patients of same age (16) were treated for extensive destruction of the maxillary frontal teeth 11, 21, with involvement of the periodontal tissues, while one case had periapical pathology, too. The cases were indicated for endodontic as well as periodontal treatment.

Results: The endodontic treatment of the both cases consisted of root canal treatment and composite restoration, while the periodontal treatment consisted of surgical flap surgery (in one of the cases also with apicotomy). Postoperative follow-up after 3 weeks, 1 year and 3 years showed the maintenance of the results of the treatment.

Conclusion: The reconstruction of the maxillary frontal teeth has restored functionality and esthetics, and satisfactory psychological impact to the patient.

Multiple Extractions During Periodontal Surgery – Case Presentation
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Introduction: Treatment option of periodontal disease in terminal stage is usually extraction. Due to pathological remains of the periodontal tissues after the extraction, the extraction site will have better regeneration process if the affected region is treated with periodontal flap surgery. During this procedure, multiple extractions are followed with profound debridement of bone defects and mucosae.

Material and method: Patient AB male, age 37 was referred for periodontal treatment with complaints of mobility and migration of the teeth in both jaws. Clinical and radiographic assessment concluded that most of the frontal teeth of both jaws are indicated for extraction. Periodontal surgery with Widman-modified flap was conducted in the frontal maxillary and mandibulary teeth. Teeth 12, 11, 21, 22, 32, 31, 41, 42 were extracted and the extraction sites were carefully cleaned, removing the pathological soft tissues and sharp bone extrusions.

Result: Postoperative visits showed that the restitution of the region was sufficient and ready to receive prosthetic appliance.

Conclusion: Periodontal treatment plan consisting of multiple extractions may be considered as one of the options for periodontitis.

The Clinical Comparison of Free Gingival Graft and Semilunar Coronally Position Flap
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Aim: Keratinized gingival tissue around teeth is essential to withstand of gingival inflammation. Among currently used procedures for gingival recession, free gingival graft auto graft is more common.
The aim of this study was to clinically compare the outcome of free gingival graft vs. semi lunar coronally position flap in order to augment gingival recession.  
**Materials and methods:** The present study was a controlled, clinical trial which 20 pairs of upper left and right canine teeth requiring gingival augmentation were exposed to surgery using (FGGP) and (SCPF). Statistical data analysis was done using SPSS software. Chi-square ($\chi^2$) test was used for comparison of color matching between two groups. Nonparametric Mann–Whitney U-test was used for comparison of dimensional changes of graft between two groups.  
**Results:** The result showed that the amount of dimensional changes in the (FGGP) was more than (SCPF) ($p < 0.05$). With regard to the color matching with adjacent tissue, the results of (SCPF) was superior to (FGGP) ($p < 0.05$).  
**Conclusion:** Both procedures had the ability to increase the keratinized gingival width, however SCPF had lower dimensional changes. In addition, SCPF had better color matching and esthetic. Also this procedure is simpler and has less side effects such as hemorrhage, wound healing.

**P080**  
**Gingival Recession Treatment with Connective Tissue Grafts or Platelet Rich Fibrin**  
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**Aim:** The main objective of this study was to evaluate the clinical effectiveness of platelet-rich fibrin membrane used in combination with a coronally advanced flap and to compare it with subepithelial connective tissue graft in Miller Class I bilateral gingival recession treatment.  
**Material and methods:** Ten healthy patients with buccal Miller’s Class I recession defects participated in this case series. Sixty recession defects were treated. Recession sites were assigned randomly into platelet-rich fibrin membrane used with a coronally advanced flap (PRF) and subepithelial connective tissue graft in combination with a coronally advanced flap groups (CTG). Root coverage and keratinized tissue gain were evaluated at 6th month. Post-surgical patient satisfaction and pain status were measured by comparing visual analogue scale (VAS) scores.  
**Results:** All treatments were effective in providing a significant reduction of baseline recession. Mean recession reduction was not statistically different between groups. Complete root coverage percentages of PRF were similar or lesser compared to the subepithelial connective tissue grafts. Operation time was significantly shorter for PRF when compared to the CTG. Use of a PRF membrane in gingival recession treatment decreased subjective patient discomfort compared to CTG-treated gingival recessions.  
**Conclusion:** The results indicated that platelet-rich fibrin membrane used in combination with coronally advanced flap can be considered as an alternative method for the treatment of Miller Class I recession defects.

**P082**  
**Mutational Analyses of the Cathepsin C Gene (CTSC) in Two Iranian Families with Papillon Lefèvre Syndrome**  
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**Purpose:** Papillon-Lefèvre syndrome (PLS; OMIM 245000) is a rare autosomal recessive disorder. Clinically, PLS is characterized by hyperkeratosis involving the palms, soles, elbows and knees which is followed later on by periodontitis, destruction of alveolar bone and loss of primary and permanent teeth. Mutations of the lysosomal protease cathepsin C (CTSC) gene have been shown to be the genetic cause of Papillon-Lefèvre syndrome. This study analyses of the Cathepsin C Gene (CTSC) mutation in two Iranian families with Papillon Lefèvre syndrome.  
**Materials and methods:** We analyzed the DNA of two members from consanguineous families for mutations by direct automated sequencing of genomic DNA that amplified for exonic regions and associated splice intron site junctions of the cathepsin C gene. We then performed RFLP to determine the presence of mutations in control groups.
**Results:** Two Iranian patients carrying Papillon-Lefèvre syndrome showing premature tooth loss and palmoplantar hyperkeratosis. Mutation screening and sequence analysis of the CTSC gene revealed a novel mutation (Del CTG, 207) in axon 1 in one patient, and one previously reported mutations (C>T 28395) in the other patient. RFLP confirmed different patterns of restricted fragment between 50 healthy controls and patient.

**Conclusions:** The presence of this mutation in these patients provides evidence for founder CTSC mutations in PLS. This mutations lead to the loss of leusine aminocide molecule that present in proteins. Our novel discovery indicates that the phenotypes observed in these two patients are due to the CTSC gene mutation.

**P083**

**Therapy of Infrabony Defects Using Combination of Bone Materials, Enamel Matrix Proteins and Membranes**

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**Aim:** Periodontal regeneration refers to the restoration of bone, cementum and ligament to their original levels before they were damaged by the periodontal disease process. It has been shown that clinical improvement of intrabony periodontal defects can be achieved with use of enamel matrix proteins (EMPs) or by grafting with bovine porous bone mineral (BPBM). This study compared the clinical effectiveness of EMPs used alone or in combination with BPBM in the treatment of periodontal intrabony defects in humans.

**Material and methods:** Twenty one paired intrabony defects were surgically treated using a split mouth design. Intrabony defects were treated either with enamel matrix proteins (EMP group) or with enamel matrix proteins combined with bovine porous bone mineral (EMP/BPBM group). Reentry surgeries were performed at 6 months.

**Results:** Preoperative probing depths, attachment levels, and transoperative bone measurements were similar for the EMP and EMP/ BPBM groups. Post surgical measurements taken at 6 months revealed a significantly greater reduction in probing depth in the EMP/BPBM group when compared to the EMP group. The EMP/ BPBM group also presented with significantly more attachment gain than the EMP group. Surgical reentry of the treated defects revealed a significantly greater amount of defect fill in favour of the EMP/BPBM group as compared to the EMP group.

**Conclusion:** The results of this study indicate that BPBM has the ability to augment the effects of EMPs in reducing proba depth, improving clinical attachment levels, and promoting defect fill when compared to presurgical levels.

**P084**

**Role of Interleukin 33 in Gingival Fibroblasts**

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**Objective:** Interleukin-33 (IL-33) is a new member of the IL-1 superfamily, binding to mIL-33R (ST2L) and IL-1 receptor accessory protein (IL-1RAP). This ternary complex signals via NF-kb and MAP kinases, activating the production of Th2 cytokines by mast cells, basophils, eosinophils and lymphocytes. In this study we sought, apart from the previously described cells, if IL-33 is released from gingival fibroblasts during periodontal inflammation.

**Material and methods:** Local ethical committee approved the study. TNF-α IgG was used to immunostain formalin fixed paraffin embedded human periodontal tissues. Ten healthy (age range 30–37 years) and ten periodontitis (age range 31–45 years) patient samples were used. The influence of TNF-α on IL-33 in gingival fibroblasts was analyzed with ELISA for in vitro analysis. Student’s t-test was used to compare data between tissues or cultured fibroblasts.

**Results:** The number of TNF-α positive cells was higher in periodontitis group compared to healthy group (p < 0.001). TNF-α located in all cell types of connective tissue, as well as in gingival fibroblasts. Upon stimulation with TNF-α, gingival fibroblasts released IL-33 (p < 0.001).

**Conclusion:** IL-33 is released during necrosis as a danger signal or alarmin, and that is related to disease severity. Chronic periodontitis is characterized by Th2 cell dominance, which has been linked to anti-inflammatory responses and periodontal repair. Therefore, TNF-α-induced IL-33 might directly link inflammation to the IL-33-dependent stimulation of Th2 cytokine-producing cells.

**P085**

**Comparison of Non-Viral Transfection on Human Periodontal Ligament Stem Cells**

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**Purpose:** Inducing human periodontal ligament stem cells (hPDLSC) differentiation by DNA transfection is a promising way for periodontal tissue engineering. However, there are very few studies focus on introducing foreign DNA into hPDLSC by non-viral methods which were relatively safe. Hence, the major purpose of this study was to compare the transfection efficiency and toxicity of non-viral gene transfer methods on hPDLSC and search a best approach and optimal protocol for transfer genes into hPDLSC using non-viral vectors.

**Materials and methods:** hPDLSC were transfected by (i) Lipofectamine 2000 Reagent, (ii) polyethylenimine (PEI), (iii) GBfectene-Elite transfection reagent, (iv) X-tremeGENE HP DNA Transfection Reagent, (v) MATra Magnet Assisted Transfection, and (vi) compared to lentiviral vectors harboring a eGFP gene. Transfection efficiency was measured by fluorescence microscope and flow cytometry. Meanwhile, cell morphology and growth status were observed in brightfield of microscope in order to estimate the cytotoxicity.

**Results:** Among these methods, the transfection efficiency of the former 4 methods was not very satisfactory (<10%), especially lipofectamine 2000. However, MATra Magnet Assisted Transfection was the most effective non-viral method (60%). Moreover,
cellular toxicity was lower than that of former 4 methods. Finally, transduction with lentiviral vectors (positive control) obtained the highest levels of transduction (95%).

**Conclusions:** In conclusion, the transfection efficiency of PDLSCs with Magnet Assisted Transfection was higher than the other non-viral transfection regents in this study although it was far less than viral vectors.

P086

**Effect of Baseline Defect Angle and Depth on Periodontal Regeneration**

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**Aim:** To examine any possible association between baseline radiographic defect angle/depth and clinical/radiographical outcomes when enamel matrix derivatives (EMD) either alone or with autogenous cortical bone graft (ACBG) were used in the treatment of intrabony defects.

**Materials and methods:** Twenty intrabony defects with a depth ≥4 mm in 10 patients with advanced chronic periodontitis were included. Following sulcular incision, flap reflection and degranulation, the depth of intrabony defect was measured. Then the root surfaces were conditioned with EDTA gel and the defects were randomly treated with EMD alone or EMD + ACGB combination. Clinical parameters were recorded for the deepest site of the defect and standardized periapical radiographs were taken at baseline and 6 months after surgery. Defect angles and the percentage of intrabony defect fill (DF) were calculated on radiographs using Image J software. Pearson method was used for statistical analysis. The study approved by the Institutional Review Board of Health Sciences of Marmara University (MAR-Yç-2009-0048)

**Results:** Both treatment groups demonstrated similar significant clinical and radiographical improvements at 6 months. Statistical analysis revealed significant negative correlation between the defect angle and attachment gain (p < 0.05), also DF (p < 0.01) in both groups. On the other hand, positive correlations were found between the defect depth and attachment gain/DF (p < 0.05) in both groups.

**Conclusions:** Our findings suggested a significant correlation between baseline radiographic defect angle/depth and periodontal regenerative healing at 6 month. Within the limits of this study, it can be concluded that the baseline radiographic defect angle and depth are prognostic indicators of treatment outcome.

P087

**Radiological Results of Apical Cystic Granuloma Treated with Cupral**

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**Purpose:** Provision of a safe alternative for apical cystic granuloma treatment.

**Methodology:** We have treated 22 cases diagnosed with apical cystic granuloma with size exceeding 0.5 cm, nine cases in maxilla and 13 cases in the mandible, mainly in multiradicular teeth. 40% of the cases were females and 60% males, aged 25–70 years old. Endodontic cavities were opened with the traditional techniques. Starting from the entrance, we propagated in 2/3 depth of the channels. A Cupral amount was applied with the help of lentyllo as deep as it was possible. Depot-suspension of Cupral was created and it was set in motion with the help of apparatus Comfort II. 4-5 sessions were carried out in the interval from 8 to 10 days. Afterwards the cases were filled with Atacamit paste. Results were observed for a period from 3-6-12 and 24 months after treatment, by clinical and radiological view.

**Results:** In the first session, the pain came as a result of proteolytic action of Cupral, noticed only in 30% of the cases. At the end of the fourth session, the patients showed no concerns in percussion and mobility, transiting mucosa color was normal. X-ray examinations after 3–6–12 and 24 months showed that destructive hearths were reduced to the maximum, and after 1 year they were ossified. The earliest radiological analysis of cases showed the effectiveness of the treatment with Cupral compared to the traditional methods.

**Conclusion:** Treatment of apical cystic granuloma with Cupral-depophorese is a safer alternative, than the treatment with Ca(OH)2 and other antiseptics.

P088

**The Application of Enamel Matrix Proteins in Regenerative Periodontal Therapy**

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**Aim:** The purpose of this study was to evaluate the effectiveness of enamel matrix proteins (EMPs) compared with open flap debridement (OFD) in the treatment of intrabony defects in humans.

**Materials and methods:** Twenty-four-paired intrabony defects were surgically treated using a split mouth design. Experimental site were treated with EMPs. Control sites were treated with an OFD. Re-entry surgeries were performed after 6 months. The primary outcomes evaluated in the study were changes in pocket depth, clinical attachment level and defect bone fill.

**Results:** No differences in pocket depths, attachment levels and intra-operative bone measurements were observed at baseline. Six months after surgery, the experimental sites exhibited highly significant reduction in pocket depth (p < 0.001) and gain attachment level (p < 0.001) compared to OFD. Surgical re-entry of the treated defects in experimental group revealed a significantly greater amount of defect fill compared to the controls (p < 0.001).

**Conclusion:** The results of this study indicate that treatment of periodontal intrabony defects with EMPs is clinically and statistically
The Effect of Surface Treatments on Bond Strength of Dentin
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Aim: The purpose of this study was to investigate the effect of different surface treatments (acid, abrasion, laser, laser + acid and air abrasion + laser) on shear bond strength of dentin.

Materials and methods: In our study, maxillary central teeth were used including 105 teeth for shear bond strength, six teeth for AFM imaging. Dentin specimens embedded to clear acrylic resin were divided into seven groups: Control, acid etching (37% phosphoric acid), air abrasion (50 μm Al2O3), Er:YAG laser etching (120 mJ, 10 Hz), laser + acid etching, air abrasion + acid etching, air abrasion + laser. After the surface treatments, IPS Empress Esthetic porcelain discs were cemented by using Variolink Veneer light-cured resin cement. After specimens had subjected to thermal cycling (10,000 cycles, 5–55°C), shear bond strength test was applied and fracture types (adhesive, cohesive, mixed) were observed. Surface treated dentin specimens were observed with SEM and AFM. Shear bond strength values were analyzed by one-way analysis of variance and Tamhane’s T2 tests.

Results: Porcelain-dentin bond strength values of laser group were statistically higher than control and air abrasion group; Porcelain-dentin bond strength values of acid group were statistically higher than control, air abrasion and air abrasion + laser group (p < 0.05). AFM and SEM images showed changes in dentin surface topography after surface treatments.

Conclusion: Laser etching produced no demineralization of peritubular dentin.
Results and conclusion: We determined that microwave disinfection increases the surface roughness of both materials, but this increase is not statistically and clinically significant. Further investigation is needed.

P092
Dimensional Stability of Made Casts from Conventional and Extended-Pour Alginites
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Objectives: The aim of this study was to determine the accuracy of casts made from alginate impression materials with immediate and delayed pouring with the help of a 3D scanner.

Materials and methods: A master model was mounted on a modified articulator designed to standardize impression procedures. A total of 125 impressions were taken and grouped into 25 groups (n = 5) according to alginate brand (CA37 (Cavex), Tropicalgin (Zhermack), Colorchange (Cavex), Hydrogum 5 (Zhermack), and Hydrocolor 5 (Zhermack)) and storage time (0, 1, 24, 72 and 120 h). Impressions were stored at 23 ± 1°C and 100% relative humidity and poured with gypsum at the predetermined storage time. Casts were scanned with a 3D model scanner. The digital models were measured and the data obtained was statistically analyzed using two-way analysis of variance (ANOVA) and Tukey’s tests (p < 0.05).

Results: With impressions poured following 0, 1 and 24 h of storage, no statistically significant differences were found between measurements made from the master model and those made from the impression casts (p > 0.05). However, with impressions poured following 72 and 120 h of storage, measurements made from the master model and those made from casts of Tropicalgin and Cavex CA37 alginites were found to differ significantly (p < 0.05), whereas no significant differences were found between measurements made from the master model and those made from Colorchange, Hydrogum 5 and Hydrocolor 5 impression casts.

P093
Fretting and Fretting-Corrosion of 316L Steel in Oral Cavity Environment
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Aim: Destruction processes of prosthetic and orthodontic appliances not only significantly diminish their stability in use but also patients’ comfort. One of causes of these negative processes, although not so well known, appears to be the destruction of kinematic connection in these appliances due to fretting an fretting-corrosion processes [1]. The paper presents the results of research on fretting and fretting-corrosion of stainless steel type 316L - widely used in dentistry, especially in prosthetic and orthodontic appliances.

Materials and methods: The investigations were carried out using original devices and following specially devised methodology worked out by the author. The friction and corrosion tests were performed in the presence of phosphoric buffer (PBS) as well as natural and artificial saliva. For research purposes some original compositions of artificial saliva were manufactured. Destruction processes resulting from fretting and corrosion were analyzed using scanning electron microscopy (SEM) and a confocal microscope.

Results: The research results have shown a strong influence of fretting on the corrosion processes (fretting - corrosion). Material transfer processes in the contact zone were observed and evaluated. Significant influence of investigated lubricants on the processes was also examined. The optimum protection effect was confirmed for human saliva and its substitute with Mucine III content.

P094
Study of Longevity of Fixed Prothesis in Tunisia
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It’s a retrospective and analytic study conducted on patients who are consulted at the emergency of the dental clinic of Monastir-Tunisia.

Aims of study:
- Determination of longevity of fixed prosthesis.
- Identification of the failure’s factors.

Materials and methods:
- Study concerned 60 patients (41.7% Men and 58.30% Women) aged between 26 and 72 years.
- In a practical way, we proceeded by performing:
  1) a clinical examination of a total patients
  2) a radiological examination of the crowned teeth.

Results: A study allowed the repartition of the sample according to age, sex, motivation prosthesis longevity and consultation motive.

Discussion: The results of study were compared to those found in the literature.

Conclusion: This study allowed to identify the factors favourising the appearance of different types of failures.

P095
Anxiety in Prosthodontic Clinic
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Aim: The psychological status of an individual is an effective stimulus for unexpected behavior. The aim of this study was evaluated
the anxiety level for patients in prosthodontic clinic, and the relationship between anxiety level and the difficult patient.

**Material and methods:** One hundred patients, 65 male and 35 female, in the age range 30–65 years were randomly selected for the study.

The State-Trait Anxiety Inventory (STAI) was used to measure the anxiety level of the selected sample.

The difficult patients were identified and classified according to Graves’s classification.

**Results:** The results clarified that, anxiety was influenced by the patients’ age, behavior and social problems. Patients aged <50 had higher anxiety levels than patients aged 50 years or over.

The social problems were a factor which increased the anxiety scores. The anxiety scores for difficult patients were higher than for normal patients, but this difference was statistically insignificant. The social problems were the main factors for creating the difficult patient (p-values < 0.05 were considered significant).

**Conclusion:** The adult patients (age group <50 years) had higher anxiety levels than the old patients. The anxiety scores for difficult patients were higher than for normal patients. The social problems were the main factors for creating the difficult patient.

**P096**

The Relationship Between Facial Variables and Maxillary Anterior Teeth

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**Introduction:** The maxillary anterior teeth are important in achieving pleasing dental and facial aesthetics. Selection of the appropriate size of maxillary anterior teeth in complete dentures may be difficult, when pre-extraction records are not available.

**Purpose:** The aim of this study was to investigate where there is a relationship between the facial variables (face width, philtrum width, mouth width, interbuccal frenum distance) and mesiodistal width of the six maxillary anterior teeth.

**Material and methods:** One hundred and sixty dental students (80 males and 80 females, aged 18–25 years) of the University of Prishtina participated in the study. Face width (FW), mouth width (MW) and philtrum width (PHW) were measured directly on the subjects, while the interbuccal frenum distance (IBFD) and the width of the maxillary anterior teeth (WMAT) were recorded on the dental cast. All measurements were made using a digital caliper (Boss, Germany) with accuracy of 0.01 mm. Descriptive statistics and regression analysis were calculated.

**Results:** The mean mesiodistal width of six maxillary anterior teeth was 46.13 ± 2.02 mm. There were significant correlation between MW (β = 0.187, t = 2.234, Sig 0.027, Partial 0.177), IBFD (β = 0.289, t = 3.837, Sig 0.000, Partial 0.295) and the width of the maxillary anterior teeth (WMAT).

**Conclusions:** Within the limitation of this study, the mouth width and interbuccal frenum distance can be used as preliminary methods for estimating the width of maxillary anterior teeth for edentulous patients.

**P097**

The Effect of Implant Shape and Screw Pitch on Bone Microdamage

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**Objective:** The aim of this study was to investigate the effect of implant shape and screw pitch on microdamage in bone during insertion of dental implants.

**Materials and methods:** Thirty custom-made implants (length, 10 mm; diameters, 4.1 mm; cylindrical, tapered and taper-cylindrical shapes; screw pitches, 1.25 and 0.8 mm; classified as 1.25C, 0.8C, 1.25T, 0.8T, 1.25TC, 0.8TC) were randomly placed in goat mandibles with a surgical device. Four cylindrical and four tapered or taper-cylindrical ostectomy sites were made as control groups. Two implant sites were prepared in the edentulous area on each side of the mandible. Immediately after the placement of implants, the bone block with the implant was collected. Histomorphometric analyses of the microcrack length (Cr.L, µm/mm²) and damaged bone area fraction (DB.Ar/B.Ar, %) were performed. Wilcoxon tests were done for statistical analysis.

**Results:** (i) On the osteotomy sites of both control groups, no evidence of any type of microdamage was discovered adjacent to the holes. (ii) Microcrack length: 1.25T>0.8T>1.25TC>0.8TC (p < 0.05). (iii) Microcrack surface density: 1.25C>0.8C>1.25T>0.8T>1.25TC>0.8TC (p < 0.05). (iv) Damaged bone area fraction: 1.25C>0.8C>1.25T>0.8T>1.25TC>0.8TC (p < 0.05).

**Conclusion:** (i) The generation of microdamage is the result of the placement of implant. Osteotomy preparation does not generate microdamage. (ii) For the implants with the same screw pitch, implant shape has a significant effect on the generation of microdamage. Taper-cylindrical implants cause the least microdamage to the bone. (iii) For the implants with the same implant shape, screw pitch has a significant effect on the generation of microdamage. Increased screw pitch cause greater microdamage to the bone.

**P098**

Establishment of Digital Models of Tilted Incisors Restored with Fiber Post-Core and Crown

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**Objective:** This study aimed to establish the three-dimensional digital model of labially or palatally tilted upper central incisors restored with fiber post-core and all-ceramic crown, and to provide the basis for the finite element mechanical analysis subsequently.

**Methods:** A maxillary central incisor extracted from a 25 years old male for periodontic reason and a #1.4 mm fiber post (match-post, RTD) were scanned by micro-CT. Then, the tooth was root canal treated and subsequently prepared according to the requirement of fiber post-core and all-ceramic crown restoration, and was...
scanned by Micro-CT again. Then the sectional images obtained from Micro-CT were imported into Mimics software to generate the three-dimensional model of nature tooth, preparation and fiber post. Then the three-dimensional model was imported into Geomagic Studio software to obtain triangular patches of preparation, fiber post, resin core and all-ceramic crown after relaxation and refinement. Finally, models of labially or palatally tilted upper central incisors restored with fiber post-core and all-ceramic crown were designed by adjusting the angle between the long axis of resin core-crown and root (0°, ±10°, ±20°, ±30°) and were imported into SolidWorks software and materialized after surface precision, to obtain the final three-dimensional models.

**Results:** The three-dimensional digital model of labially or palatally tilted upper central incisors restored with fiber post-core and all-ceramic crown were obtained.

**Conclusion:** This study establishes the three-dimensional digital model of labially or palatally tilted upper central incisors restored with fiber post-core and all-ceramic crown were obtained.

**Materials and methods:**
A sample of 114 community-dwelling adults was selected; all were aged ≥65 years, were completely edentulous, wore complete dentures on both arches. Participants were randomly drawn from four senior day-centres for elderly people. Data were collected using an oral health interview, a clinical oral examination, a visual analog scale (VAS) and Oral Impacts on Daily Performances (OIDP) questionnaire. The oral health interview recorded data on socio-demographic information and their previous denture history including number of previous dentures and period of wearing the existing dentures. The existing complete dentures were evaluated by the same prosthodontist for retention, stability, occlusion, articulation and vertical dimension. Participants rated their level of satisfaction with their dentures using a VAS. OHRQoL was assessed through Bosnian version of OIDP, recently validated for this population. The data were statistically analyzed using descriptive statistics and Spearman’s correlation.

**Results:** Overall, 42.1% reported at least one oral impact in the last 6 months. Difficulty eating (33.3%) and difficulty smiling (17.5%) were the most common impacts. The Spearman correlation coefficient revealed no significant correlation between the functional assessment of denture and patients’ satisfaction for any of the factors evaluated.

**Conclusion:** The prevalence of oral impacts was high. There was no significant correlation between the clinical variables assessed by the prosthodontist and subjective variables evaluated by the patient.

**P101**

**Diagnosis and Management Challenges of Temporomandibular Joint Dysfunction and Pain Syndromes**

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**Objective:** Diagnosis and management of temporomandibular joint (TMJ) is challenging. In some cases, patients don’t need to be systematically referred to a TMJ-specialist and general dental practitioners can make diagnosis and offer valuable treatment plan to
patients. We report here three clinical cases illustrating this approach.

Methods: In all three cases, the main clinical symptom was chronic TMJ pain accompanied by clicking and popping. One patient had also a discomfort, locking of TMJ. Panoramic orthopantomography and dental occlusal analysis were systematically performed using a semi-adjustable articulator following a careful physical examination.

Results: In two patients, our results showed a poor occlusion. One with linguoverversion of teeth #37–47, responsible for a limited mandibular propulsion and retrusion. The second, with multiple tooth positioning abnormalities, responsible for reduced jaw mobility. In these patients with objectively diagnosed occlusal problems, a treatment associating occlusal bite splint (OBS), physiotherapy, on demand NSAID drugs was given. Clinical signs were rapidly decreased 1 week after the beginning of the treatment and subsequently, restorative dental solutions such as implants or dental prostheses were used to give a long-lasting physiologic occlusion. In our third patient, despite disabling pain, no clinical or radiological abnormality was detected. She had a satisfactory OBS treatment leading to pain relief.

Conclusion: Pathophysiologic of TMJ pains are not fully understood. Patients with objectively detected occlusal disorders should be distinguished from those with chronic pain but no detectable abnormalities. Treatment strategy should be adapted accordingly. General practitioners may start treatment with OBS, nonspecific pain management and refer difficult cases to specialists. The potential link between anxiety, depression and TMJ pain should be carefully evaluated since anxiety may induce TMJ pain or anxiety may be increased by unrelieved permanent pain.

P102
Effect of Core Build-up Materials on Polymerization of Elastomeric Impressions
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Objectives: The purpose of this study was to detect whether multiple core build-up materials could have a negative effect on the polymerization of commercially used elastomeric impression materials, and to evaluate several decontamination methods to eliminate any inhibitory effect of core build-up materials.

Materials and Methods: The polymerization of six brands of elastomeric impression materials (Virtual, Aquasil, Genie, Correct Plus, Express and Impregum) was evaluated in vitro after direct contact with various core build-up materials (composites resin, flowable composites and resin-modified glass ionomers). The setting of impression materials was visually scored as either inhibited or non-inhibited independently by three different general practitioners. Different methods to prevent inhibition were also tested. The materials were dispensed according to manufacturers’ instructions on exposed dentin of premolar teeth mounted in dental stone. A chi-square analysis was used to evaluate the results (p < 0.05).

Results: Setting inhibition was found with five brands of polyvinylsiloxane impression materials when in direct contact with four types of core build-up materials, while none of the materials used caused inhibition to the polyether impression material. No decontamination method proved adequate in preventing impression material inhibition except grinding 1 mm from the multicore restoration surface. Examiners were in complete agreement (kappa +1).

Conclusions: Under these in vitro conditions, direct contact of polyvinyl siloxane impression materials to some brands of core build-up materials resulted in polymerization inhibition. For optimal result, flowable composites should not be used as a core build-up material with PVS impression materials; polyether is the material of choices.

P103
A 13 Year Follow-Up Study of In-Ceram FPDs
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Aim: The aim of this study was to review the long-term clinical performance of In-Ceram Fixed Partial Dentures (FPDs).

Materials and Methods: The study comprised a total of 33 FPDs luted with zinc phosphate (n = 17) cement and glass ionomer cement (n = 16). The California Dental Association (CDA) quality rating system was used to clinically evaluate the FPDs. The Kaplan and Meier nonparametric statistical method was used to analyse the fracture rates obtained.

Results: The estimated survival rate at 13 years for all FPDs was 60.6%. For the CDA rating “Surface”, the score “excellent” decreased from 91% at baseline to 21% (p < 0.001) at the 13 years clinical evaluation. There were no statistically significant differences between the two luting agents used in regard to the fracture rates obtained.

Conclusion: Almost 40% of the In-Ceram ceramic bridges had fractured after 13 years, which emphasize that the risk of fractures has to be taken into consideration when planning for ceramic FPDs that are likely to be subjected to great stress.

P104
Osteonecrosis in Subpontic Bone of Fixed Partial Denture
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Aim: To achieve predictable success Fixed Partial Denture (FPD) prostheses an adequate abutment teeth and supporting structures including a compact alveolar bone beneath the pontic are required. Osteonecrosis is not a disease in the usual sense but is the result of wide variety of local and systemic disorders that eventually lead to ischemia and infarction of the marrow and bone. Osteonecrosis can occur in the jaw bone that can result in ulcers (sores) of gum
tissue, exposed jaw bone and pain. The problem is approximately 90% of subpontic bone demonstrated either ischemic osteonecrosis (68%) and more than 84% of the patients had abnormal radiographic changes. The aim of this study is to discuss osteonecrosis caused of FPD wear. The jaw bones are separated from a trauma-intense and microbiologically diverse oral environment by thin mucosa and periosteum. Trauma to the periosteum may also serve to initiate osteonecrosis in patients wearing dentures or dental prostheses.

**Conclusion:** In conclusion, multifactors of local and systemic condition lead to osteonecrosis caused of FPD such as, extracted infection tooth, poor healing, traumatic prosthetics wear, bisphosphonates medications, herediter and aging process or combination of these factors.

**P105**

**The Effect of the Gonial Angle on Masticatory Performance in Denture Wearing**

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**Aim:** To analyze the gonial angles of the mandible and to determine the relationship of gonial angles, gender, age, duration of the edentulous period, alveolar ridge resorption and the masticatory performance in complete denture wearers.

**Methods:** Thirty edentulous patients were enrolled in this study. The gonial angles and degree of alveolar ridge resorption of the mandible were measured using panoramic radiographs. Patient’s gender, age and duration of the edentulous period were recorded. The masseter and anterior temporalis muscle activities were recorded electromyographic (EMG) measurements, 3, 6, 9 and 12 months after insertion of the new dentures for the masticatory performance. EMG measurements were recorded during maximum voluntary contraction and while chewing pieces of chewing gum and peanut.

**Results:** There was no statistically significant difference between right (124.12°) and left (124.70°) gonial angles (p > 0.05). There was a statistically significant difference between gender in gonial angles (p < 0.05). The gonial angles of female subjects were greater than male subjects both on the right and left side. No statistically significant difference was seen between the gonial angles and age, duration of the edentulous period and alveolar ridge resorption (p > 0.05). However a negative correlation was found between EMG activity and gonial angles, it was not statistically significant (p > 0.05).

**Conclusions:** Female subjects have larger gonial angles both the right and left sides than male subjects. The size of the gonial angle did not correlate with masticatory performance.

**P106**

**Full Mouth Rehabilitation of a Patient with Severe Deep Bite: A Case Report**

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**Aim:** Increasing the vertical dimension is essential to resolve each of problems associated with deep bite. Restorative dentistry, orthodontia and oral surgery are the three disciplines that can perform to help gaining the vertical dimension necessary in these patients.

**Case:** This case report presents increasing vertical dimension with the full mouth restorative treatment procedure for a 40-year-old male patient who exhibited severe deep bite. After clinical evaluations, extraoral examination showed a reduction of the lower facial height and protuberant lips, wrinkles, drooping and overclosed commissures. Additionally, intraoral examination showed a severe anterior deep bite articulation and upper incisors were in contact with the labial tissue of lower incisors. A removable partial denture was made at increased occlusal vertical dimension to use in the first stage of rehabilitation. Diagnostic wax-up was performed at the increased vertical dimension. Then, provisional crowns were fabricated according to this increased vertical dimension. Interim restorations were used for 3 months as a guide for preparing the definitive restorations.

**Conclusion:** The adaptation of patient to the increased occlusal vertical dimension was evaluated. During this period the patient was asymptomatic. Following the evaluation period definitive restorations were completed and routine clinical assessments were made at the 1st week, 1st month, 3rd month and 6th month, then 1st and 2nd year with visual and radiographic examinations.

**P107**

**An Alternative Method of Adding Eyelashes on Orbital Prostheses**

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**Aim:** Development of an alternative technique about adding eyelash on orbital prostheses.

**Material and method:** Impression of defect and healthy side was made as traditional methods. Ocular prosthesis location was determined according to the anatomical planes. Wax modeling was completed on the dental stone model. Eyelashes were embedded in this wax phase. After this phase, eyelashes were coated with silicone elastomer impression material. After this phase, silicone prostheses finished by traditional methods.

**Results:** In contrast to the traditional method, it was determined that the appearance output as natural as natural eyelash. There was not displacement in eyelashes.

**Conclusion:** Eyelashes bonded with various adhesives in the traditional method. In this proposed method, there was not required adhesive. Thus was prevented dirty appearance, and rupture of eyelashes and orbital prostheses. With this method, orbital prosthesis could be meet the expectations of the high aesthetically image of the patients.
Antimicrobial Efficacy of Denture Cleaners
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Purpose: The purpose of this study was to evaluate efficacy of two commercially denture cleansers on microorganism.

Material and methods: Staphylococcus epidermidis, Streptococcus viridans, Streptococcus pneumoniae, Escherichia coli, Enterobacter aeruginosa, Pseudomonas aeruginosa, and Candida albicans patient saliva and additionally Staphylococcus aureus and Enterococcus fecalis isolated from isolates of the clinical microbiology laboratory. All microorganisms were transferred into 2 ml Brain-Heart-Infusion Broth containing tubes and were incubated at 36±1°C for 3 h. After incubation, these samples were cultured routinely on different mediums at 36±1°C for 24 h. 0.5 Mc Farland suspensions were prepared for each strain (108 CFU/ml) and two commercially available denture cleansers (Protefix Active Cleanser and Corega) were prepared manufacturers’ instruction. 45 × 2 sets sterile tubes were prepared for five different dilutions (1/2, 1/4, 1/8, 1/16, and 1/32) including mixture of Mc Farland suspensions and denture cleansers. This mixture tubes were stored in incubator at 37°C for 24 h. At the end of 24 h, samples from each tube were inoculated widespread surface Muller Hinton Agar Plates and incubated for 24 h again. After incubation, the growth of bacteria was performed by counting the Colony-forming Units.

Results: 1/2 dilution of Protefix was especially determined to be effective on gram-positive bacteria. In all dilutions of Protefix, Pseudomonas aeruginosa, Candida albicans, Enterobacter aeruginosa, and Enterococcus fecalis were not eliminated completely. 1/2 dilution of Corega had an antibacterial activity, except Pseudomonas aeruginosa. 1/4 dilution of Corega had an antibacterial activity on Staphylococcus epidermidis, Streptococcus pneumoniae, Escherichia coli, and Enterobacter aeruginosa.

Evaluation of Antimicrobial Activity on Denture Adhesives
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Purpose: The purpose of this study was to evaluate antimicrobial activity on four commercially denture adhesives.

Material and methods: Staphylococcus epidermidis, Streptococcus viridans, Streptococcus pneumoniae, Escherichia coli, Enterobacter aeruginosa, Pseudomonas aeruginosa, and Candida albicans isolated from patient saliva and additionally Staphylococcus aureus and Enterococcus fecalis isolated from isolates of the clinical microbiology laboratory. All microorganisms were transferred into 2 ml Brain-Heart-Infusion Broth (BHIB) containing tubes and were incubated at 36 ± 1°C for 3 h. After incubation, these samples were cultured routinely on different mediums at 36 ± 1°C for 24 h. Four sterile petri dishes were prepared for two creams (Protefix cream and Corega super cream) and two powder (Protefix powder and Corega Ultra powder) forms of denture adhesives. On each petri dish, nine divisions were made to prevent mixing of bacteria that were inoculated. Suspensions were prepared from all microorganisms in 0.5 Mc Farland. From each bacteria suspension, 40 μl of bacteria were inoculated into small pits in each nine separate divisions and then all plaques were incubated at 37°C. Bacteria count per ml was calculated as CFU/ml by taking 10 μl sample on surface of covering medium petri dishes every 8 h.

Results: Staphylococcus epidermidis was not determined in Corega Ultra Powder specimen after 2nd measurement at the earliest, while Escherichia coli and Pseudomonas aeruginosa was not determined in Protefix Powder specimen after 5th measurement at the latest. As a result of both of them were determined antimicrobial activity.

Prosthetic Rehabilitation of a Patient with Cleidocranial Dysplasia
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Introduction: Cleidocranial dysplasia (CCD) is an uncommon but well-known genetic skeletal disorder affecting bones and teeth. CCD is associated with complete absence or hypoplasia of the clavicles, delayed or deficient closure of the fontanellas and open sutures, retarded exfoliation of the deciduous teeth, retarded eruption of the permanent teeth and multiple impacted supernumerary teeth.

Case: This case report describes the prosthetic rehabilitation of a 31-year-old Caucasian woman with CCD who had been through an unsuccessful orthodontic treatment for 10 years and absolutely didn’t want any more orthodontics. The patient was suffering from severe periodontitis. Hopeless teeth and dislocated supernumerary teeth were extracted and the patient was treated with a removable denture retained by double crowns with flanges to obtain lip support. Regular recalls are planned in order to check if the impacted teeth without any bone retention are erupting and if so to prepare appropriate space in the denture.

Conclusion: Fabricating a removable denture is a viable prosthetic treatment option for adult patients with CCD in order to obtain lip support and to be able to modify in case any of the impacted teeth erupts.
Changing the Bonding Force of Impression Tray to Edentulous Maxillary Jaw with Impression Valve System

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Aim: The aim of this study was to change the bonding force of impression tray to maxillary jaw with new apparatus that ensures better separation between impression tray and maxillary jaw.

Materials and methods: In this in-vitro study, polyether-coated impression valve system (IVS) was placed into the maxillary jaw simulator (FM) that simulates edentulous maxillary edentulous ridges and peri-implant region. The purpose of this study was to change the bonding force of impression tray to maxillary jaw with new apparatus that ensures better separation between impression tray and maxillary jaw.

Results: The strain patterns produced by MDC, bar and ball attachments with and without major connectors (posterior palatal bar) on edentulous ridges and peri-implant region were not found to be statistically significant (p > 0.05). Additionally, no significant difference was observed between MDC, bar and ball attachment types considering the strain values.

Conclusion: MDC, bar and ball retained maxillary overdentures with four implants can be used safely without major connectors (posterior palatal bar) with regard to the strains generated on edentulous ridges and peri-implant region.
Telescopic Systems
Evaluation of Materials Facing Zirconia Primary Crowns in
P116
Long-term retention force changes, wear and phase transformation.

Two different dual cure resin cements were polymerized under each ceramic sample using a LED curing unit, thus eight groups were formed (n = 12). Degree of conversion was evaluated using Vickers Hardness Test and depth of cure of samples were measured. Data were analyzed statistically using One-way ANOVA and Tukey’s HSD test (p < 0.05).

Results: Microhardness and depth of cure values were different under same thickness of ceramic discs for two resin cements. As the thickness of the zirconia discs increased, the microhardness values and depth of cure decreased.

Conclusion: Photocuring time cannot be the same for all clinical conditions therefore the manufacturer’s recommendations may not be successful in all situations. Clinicians should be aware that, especially for dual-cure resin cement under thicker zirconia restorations (>2.0 mm), an extended period of light curing or a light unit with a high irradiance should be used.

P115
The Evaluation of Periodontal Changes in Fixed Prosthesis
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Aim: The aim of this study is to evaluated of the influence of fixed prosthesis on the periodontal health status, emphasising the pathological changes induced by the restorative materials.

Materials and methods: The study group was made by 112 patients evaluated 282 fixed dental bridges by clinical and paraclinical exams. The clinical evaluation included the age of the dental bridge, the material was made of, the periodontal clinical exams. The clinical evaluation included the age of the patients evaluated 282 fixed dental bridges by clinical and paraclinical exams. The clinical evaluation included the age of the patients evaluated 282 fixed dental bridges by clinical and paraclinical exams. The clinical evaluation included the age of the patients evaluated 282 fixed dental bridges by clinical and paraclinical exams.

Results and discussion: Periodontal changes were highlighted by periodontal bleeding index, with significant values for 46.43% of the cases, by periodontal pockets in 12.5% of the cases, by recession in 3.57% of the studied cases.

Conclusions: There is a significant correlation between the material in use for the dental bridges and the presence of the periodontal damage, specially for the metal – acrylic and cast metal crowns.

P117
Corrosion Behavior of Ni- Cr Alloys in %10 Carbamide Peroxide
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Purpose: The aim of this study was to investigate the corrosion behaviour of two different commercially available Ni- Cr metal alloys exposed to %10 carbamide peroxide solution using electrochemical technique.

Material and methods: Two types of dental metal alloys [Bella- bond Plus (Ni- Cr- Mo) and Wiron 99 (Ni- Cr- Mo)] were evaluated. Fabrication of test samples (n = 3 for each alloy) was carried out using lost-wax technique. All samples with their contact surfaces open were immersed in polyester material, which was then poured into a Teflon cylinder mould, and in this manner the rotary disc electrodes were constructed. The experiments were carried out in a galvanic cell that was open to air and the temperature was kept constant. Cyclic potentiodynamic polarization tests were used to evaluate the corrosion behaviour of metal alloys in %10 carbamide peroxide of bleaching agents with pH 6, 5 at 37°C. Corrosion values of metal alloys were detected electrochemically. Each sample was polarized three times and the mean of all were calculated.

Results: Results showed that the dental metals investigated in this study corroded in %10 carbamide peroxide solution. Corrosion rate values of Bellabond Plus and Wiron 99 alloys were 1.87 μA/cm² and 3.21 μA/cm² respectively.

Conclusion: Wiron 99 alloy exhibited the higher corrosion tendency in carbamide peroxide solution. Bellabond Plus alloy demonstrated more desirable corrosion resistance properties comparing to Wiron 99 alloy.
P118
Accuracy of Bite Mark Analysis: An Affirmation to the Guilt
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Purpose: The study aims to conduct the most accurate bite mark overlay fabrication technique.

Materials and methods: Thirty subjects both male and female with age above 20 years with complete set of natural upper and lower anterior teeth were selected for this study after Institutional Ethical Committee Approval. The upper and lower alginate impressions were taken from 30 subjects. Die stone model was obtained from each impression; overlays are produced from the biting surfaces of six upper and six lower anterior teeth using the following methods like: Hand tracing from study casts, Hand tracing from wax impression method, Radiopaque wax impression method and Xerographic technique.

Results: Xerographic method was the most accurate with highest reproducibility for bite mark analysis compared to hand tracing from wax method and hand tracing from study casts.

Conclusions: Comparison techniques used in bite mark analysis are many and varied, the choice of technique depending largely on personal preference. Until recently, no one technique has been shown to be better than the others and very little research has been carried out to compare different methods. This study evaluated the accuracy of direct comparisons between suspects’ models and bite marks with indirect comparisons in the form of conventional traced overlays of suspects with the xenographic technique being the best.

P119
Endocrown Restorations in Anterior and Posterior Regions of the Dental Arch
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Introduction: Restoration of endodontically treated teeth is a common problem in restorative dentistry, related to the fractures occurring in such teeth. The access preparation for endodontic treatment causes the loss of the roof of the pulp chamber, which may account for the relatively high fracture incidence documented in pulpless teeth. Posts have often been described as not to reinforce endodontically treated teeth. Moreover, some authors noticed that posts may interfere with the mechanical resistance of teeth, increasing the risk of damage to residual tooth structure. With the development of adhesive techniques and ceramic materials, the advantage of adhesive restorations is that macroretenive design is no longer a prerequisite if there is enough tooth surface for bonding. All-ceramic endocrown restorations have been used as an alternative to post-core restorations in teeth with excessive tissue loss by utilizing the adhesive bonding techniques. The objective of this restorative approach is to provide adequate function and esthetics in the anterior and posterior regions of the dental arch.

Case: Patients presented in this report were chosen from the group who applied for treatment in our clinic having excessive tissue loss in their anterior teeth, due to trauma and posterior teeth because of profound caries. After the endodontic treatments, tooth preparations were accomplished. Additional silicone materials were used for impressions. Restorations were made by pressed glass ceramics (Ivoclar-Vivadent, Schaen, Liechtenstein) and cemented by a self curing (Super-Bond C&B- Sun Medical Co. Ltd, Shiga, Japan) adhesive resin material.

Conclusion: Patients were followed 1 year after the insertion of endocrown restorations.

P120
Effect of Carbamide Peroxide on Elemental Release from Heat-treated Alloy
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Objective: This study investigated the effect of various heat-treatments simulating porcelain firing on elemental release from a base metal alloy subjected to 10% carbamide peroxide (CP).

Methods: Cylinder shaped 30 specimens were cast from Ni-Cr alloy(Wiron 99) and divided into following three groups (n = 10) after finishing: (1) casting (as-cast state), (2) casting, simulating firing procedure according to a mean value (950°C for 5 min) (3) casting, simulating firing procedure according to general porcelain firing cycle without applying porcelain. Then all groups were divided into additional two sub-groups, each contains five samples. Test groups were exposed either phosphate-buffer solution (PBS) as control or CP for 15 days; then total mass and individual elements (Ni, Cr and Mo) released into solutions were measured by means of atomic absorption spectrometry. Differences in total mass released were determined using for ANOVA and Dunnett T3 test.

Results: Presence of CP induced the total mass released compared to control group; this effect was recorded in both as-cast and heat-treated groups. For PBS and CP treatments, the order of total mass released was 1, 2, 3 and 1, 2, 3, respectively. All differences were found statistically significant. With in the limitations of this study, results showed that procedures for porcelain firing have different effects in presence of CP. For all groups (except for group3/PBS treatment), the order of individual elements released was Ni, Mo, Cr. The increase in amount of Cr released was higher than Mo released for group3/PBS treatment.

Theme: General Dentistry and Oral Health

P121
Efficacy of Elaeagnus angustifolia Topical Gel in the Treatment of Symptomatic Oral Lichen Planus
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Background and aims: The purpose of this study was to determine efficacy of 19% Elaegnus angustifolia (EA) topical gel in the treatment of symptomatic oral lichen planus.

Materials and methods: Patients with symptomatic oral lichen planus referring to the Department of Oral Medicine, Faculty of Dentistry at Shahid Beheshti University of Medical Science were asked to participate in the study. Twenty-eight patients who were histopathologically diagnosed with lichen planus were divided into two groups (15 in the case and 13 in the control groups). The subjects were randomly assigned to either topical gel of EA or placebo in a double-blind manner. They were then instructed to apply the medication on dried lesions three times daily. Pain and size of the lesions were evaluated after 2 weeks. Data were analyzed by SPSS 12.0 software, using t-test, paired t-test, Fisher’s exact test and chi-square test.

Results: Twenty-eight patients (m/f: 7/21) with symptomatic oral lichen planus participated in the study. Fifteen patients (m/f: 4/11) received EA gel and 13 patients (m/f: 3/10) received placebo. There was a 75% decrease in pain (33.3% in the case and 7.7% in the control group), and a decrease of 50% in size (33.3% in the case group) and 75% only in 7.6% of the case group.

Conclusion: The results suggest that 19% EA gel is efficient in the treatment of symptomatic oral lichen planus, with anti-inflammatory and analgesic effects, as well.

Good Occlusion Impact on Chewing Muscles Electromyographic Activity

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Aim: To study the relationship between teeth occlusion and muscle activity in patients with healthy teeth expressed by number of teeth contacts.

Material and method: The sample consists of 20 patients (10 M/10 F) from 25 to 40 years old. The patients had full dental formula up to the second molar, belonged to Angle I classification. The electromyography data were conducted with an eight-channel electromyography on a computer allowing recording and graphic presentation. Electrodes were located on masseter muscle and anterior temporal muscle on both sides over Bausch joints. We verified the teeth contacts from 17 to 27. Each patient clenched their teeth for a few seconds registering the electromyography potential.

Results: 25% of teeth contacts of first group and 28% of second group were found on first molar, 25% of first group and 20% of second group are found on premolars, 24% of contacts of first group and 10% of second group were recorded on canines and incisive. We calculated the POC for each patient for masseter and temporal muscles, mean values 86.49% (temporal), 85.59% (masseter) with a mean of 86.04%.

Conclusions: The results verify the systematic impact of occlusive contacts on the elevator muscle activity during clenching. The study gives a good relation between the morphology expressed as a number of the teeth contact and their function expressed by EMG waves.

Awareness and Perception of Dental Students on E-learning Use

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Aim: To assess the awareness and perception of dental students on the use of e-learning as an instructional tool in dental education.

Materials and methods: A descriptive cross-sectional study was undertaken using one hundred and five 5th and 6th year clinical dental students. Ethical approval was granted by the relevant body. Data collection was by self-administered questionnaires consisting of five sections. Information obtained include; socio-demographic characteristics, awareness on e-learning, perception on benefits and challenges of e-learning, perception on e-learning compared with conventional classroom learning.

Results: Majority (94.3%) of respondents have heard of e-learning, 61.5% have prior use of at least one e-learning tool with CD/DVD-ROM and audio/visual conferencing been the most commonly used e-learning tools (32.4% each) and virtual reality/simulation been the least used (1.0%). Increase access to lecture materials and ease of lecture delivery to a large number of students were identified as two major benefits of e-learning (68.6% and 55.2% respectively) while poor electricity supply and poor internet access were the major challenges confronting e-learning (65.7% each). Majority of respondents (93.3%) strongly agreed or agreed that e-learning should be combined with conventional classroom learning.

Conclusion: The use of e-learning in dental education is an exquisite innovation with numerous benefits. However, poor electricity supply and poor internet access are major obstacles that may militate against its use as an instructional tool in dental education.

Surgical Treatment of Odontogenic Infections with Acute Periapical Lesions in Children

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Introduction: Bacterial infections of odontogenic can progress into periapical lesions. In cases of periapical abscess, surgical incision and extraction of teeth is preferred to nonsurgical treatment.

Materials and methods: In this historical study, twelve patients under 10-year-olds took part with variable periapical lesions. All teeth showed radiographic evidence of periapical lesions, varying in size from 5 to >10 mm.
Patients were take hydroxizin syrup as premedication before the application of local anesthesia (3% perilocain), incision with scalpel No. 15, drainage abscesses and then analgesic and systemic orally antibiotics prescribed for them.

**Results:** The rate of complete healing for each patient after procedure was good (95%).

**Conclusion:** Surgical treatment should be considered as the first choice in teeth with acute periapical lesions.

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**P125**

**HMGB1 Induced Alveolar Bone Cells Proliferation and Migration**

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High mobility group box 1 (HMGB1) is a protein released from damaged cells during inflammation. Upregulation of HMGB1 was found in many inflammatory diseases including periodontitis. Our previous study showed HMGB1 had proliferatory and chemoattractive activity in human gingival fibroblast (HGF) and human periodontal ligament fibroblasts (HPDLF) suggesting key role of HMGB1 in periodontal tissue healing.

**Aim:** In this study, we investigated the effect of HMGB1 on the proliferation and migration of human alveolar bone cells (ALV) as well as expression of its receptors, TLR2, TLR4 and RAGE.

**Materials and methods:** ALV was cultured in the presence of 10 or 50 ng/ml human recombinant HMGB1. Cells proliferation was determined by MTT assay. Migration assay was performed by culturing ALV in Transwells with 100 ng/ml HMGB1 in the lower chamber as a chemoattractant. The 16-h migration was determined by crystal violet staining of the cells migrated across the membrane. TLR2, TLR4 and RAGE expression was analyzed by real time PCR.

**Results:** HMGB1, at 50 ng/ml, was able to induce ALV proliferation and induced migration at 100 ng/ml. Surprisingly, HMGB1 receptor, TLR2 and TLR4, levels were found downregulated. Nevertheless RAGE expression was slightly upregulated.

**Conclusions:** Proliferation and migration are crucial abilities the cells required for appropriate wound repair. The data suggested HMGB1 promising role in alveolar bone healing. Detailed mechanism, possible through RAGE receptor, requires further investigation before future clinical application.

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**P126**

**Parotid Salivary Glucose Level in Diabetes Mellitus Patients**

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**Purpose:** The purpose of this report was to investigate the relationship among the blood glucose, salivary glucose and parotid glucose of type II diabetes, and to evaluate the significance of diagnosis on single gland salivary glucose to patients with type 2 diabetes.

**Material and methods:** Thirty patients with type 2 diabetes and 30 healthy controls were selected. For investigations, the samples of 30 people with diabetes and the age and sex matched 30 non-diabetic subjects were recruited. The salivary glucose was analyzed in unstimulated whole mixed and the parotid saliva samples using glucose oxidase peroxidase method. Statistical analysis was performed to assess the correlation between salivary glucose level and blood glucose level by r test. The present study was approved by the Research Ethics Committee.

**Results:** The blood glucose and parotid salivary glucose levels of the experimental group were significantly higher than the control group, respectively p < 0.01, p < 0.05. But the mixed salivary glucose concentration in the experimental group had no significant variation with the control group. In the experimental group the parotid salivary glucose levels had positive correlation with the blood glucose, r = 0.810.

**Conclusion:** The parotid salivary glucose levels in patients with type II diabetes were higher than in non-diabetic subjects. The single parotid salivary glucose concentration was a potential marker in monitor of the type II diabetes mellitus and may be useful in the management of diabetic patients

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**P127**

**An Evaluation of the Role of Community Pharmacist in Oral Healthcare**

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**Aims:** To determine the oral healthcare advice, products and information provided by community pharmacists in Malaysia and to identify the barriers and needs of the community pharmacists to play their role as oral health promoters.

**Materials and methods:** A questionnaire was developed based on the available literature and validated. The questionnaire comprised of six sections addressing the information related to nearby dental practices, the advises sought by the public in relation to their oral health, the dental products available, the dental knowledge of the participants and the barriers and needs to improve their role as part of the primary healthcare team. Four hundred ninety six community pharmacies were approached and an interview with the pharmacist was arranged.
Results: The study yielded an 86% response rate. The participants were aware of the nearby dental practices (78%) but only few were aware of opening and closing hours (35%). The most common complaint received by the public was the mouth ulcers (62%). Electric tooth brushes were the products least available (54% of the pharmacies). The pharmacist were least confident in providing information regarding dental caries and tooth whitening (62% and 58% respectively) the pharmacist showed interest in playing an active role as an integral part of primary healthcare teams with the guidance of dental bodies.

Conclusion: Community pharmacists in Malaysia provide oral healthcare advice to public and they can be an integral part of oral healthcare workforce by providing them with more support and training.

P128
Bisphosphonate Related Osteonecrosis of Jaws (BRONJ)
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Introduction: Bisphosphonates are widely used in the management of metastatic disease to the bone and in the treatment of osteoporosis. BRONJ is a serious condition that has been reported by dental practitioners and physicians in cancer and osteoporosis patients on bisphosphonate therapy.

Materials and methods: This is a computer based research that includes Medline and Pubmed databases. Out of 156 articles, eight of them were clinical trial and 38 of them were review article.

Results: People who receive frequent, high dose of bisphosphonates over long period of time and have periodontal disease, poor oral hygiene, invasive oral surgery such as dental extraction are the most one who is at greatest risk for developing BRONJ.

Conclusion: The dental practioners, physicians and patients must come to a consensus before any dental treatment begins and dental practitioners must ask patients specifically about bisphosphonates as a part of their medical history.

P129
Oral Self Care in an Elderly Population
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Objectives: To assess knowledge, attitude and practice of oral self-care in an elderly population.

Method: A descriptive cross-sectional study of elderly people from the age of 65 years and above who resided at the Lagos Island Local Government Area was conducted using interviewer-administered questionnaires.

Results: Of the 200 elderly surveyed, 54.9% clean their teeth with chewing stick rather than toothbrush with fluoridated toothpaste while 48.5% clean their teeth twice daily. 72.6% have never visited the dentist in their lifetime. It was observed that there is a strong association between the level of education and the knowledge (p-value = 0.0000) and attitude (p-value = 0.0003) of oral self-care among the elderly.

Conclusion: From this study, it can be observed that there is poor oral self-care which can be directly related to the poor negative attitude towards the utilization of dental services due to little or no available funds for routine dental check-up. Therefore, increased need for public enlightenment and awareness campaigns are highly recommended.

P130
Effects of Medicinal Plants on Candida Albicans
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Aim: There has been growing interest in recent years for the use of organically grown plants for medicinal purposes. The aim of this study was to determine which medicinal plant had the most in vitro antimicrobial activity on Candida albicans.

Material and methods: MATEhanolic extracts of Sinapis, Thymi, Rosmarini, Hyperici, Teucrri, Absinthii, Plantaginis, Salviae, Calendulae, Calami, Malvae, Tiliae, Hipocastani, Bursae, Majoranae and Millefolii and essential oils of Rosmary, Salviae, Satureae and Thymi were prepared. Candida albicans ATCC 10231 was first multiplied by growing overnight at 37°C in Mueller-Hinton Broth at pH = 7.4. Antimicrobial activity of medicinal plants extracts was determined by the dilution method. Four dilutions (300, 150, 75 and 36.5 mg/ml) of medicinal plants extracts and four dilutions (100, 50, 25 and 12.5 mg/ml) of essential oils were mixed with Saburaud dextrose agar and poured into Petri dishes in a 4 mm layer. Candida albicans was inoculated at about 106 mo/cm2 and incubated at 37°C for 48 h. The presence of colonies on all samples was tested in triplicates.

Results: Results are shown as minimum inhibitory concentration (MIC). Extract of Hipocastani had a strong antimicrobial activity (MIC = 37.5 µg/ml) and Rosmarini, Hyperici and Salviae had no effect at all. The essential oil of Satureae was inhibitory at 12.5 µg/ml, while Thymi had no effect on the growth of Candida albicans.

Conclusion: The ethanolic extract of Hipocastani and the essential oil of Satureae may be used for the preparation of antimycotic medicines for oral candidiosis.

P131
Quantitation of the Stem Cell Derived from Human Exfoliated Deciduous Teeth Using a Luminescent Cell Viability Assay before the Culture
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Objective: Stem cells from human exfoliated deciduous teeth (SHED) have been identified as a novel population of stem cells capable of differentiating into a variety of cell types. Because of the small numbers that could be isolated from a single tooth the researchers avoid counting the total number of stem cells. Here we provide a new easy and useful method for the enumeration of SHED using a luminescent viability assay.

Materials and methods: 156 normal exfoliated human deciduous teeth were collected from young children under sterile conditions. SHED were isolated using collagenase/disprase digestions solutions. Separated stem cells were placed in opaque-walled multiwall plates in culture alpha Modified Eagle’s Medium. For dental pulp stem cells quantitation a simple method for determining the number of viable cells based on ATP concentration was used. Cells attached to the bottom of the multiwall plates were directed toward the osteogenic, adipogenic, lineages at the respective passages. Flow cytometry was used for immunophenotyping of cultured dental stem cells.

Results: Cells counted with the luminescent assay, after culture formed fibroblastic morphology and expressed the mesenchymal stem cell markers CD29, CD105, CD146, CD44. There was a correlation between the number of cells plated for culture and the number of mesenchymal stem cells after culture. Osteogenic and adipogenic differentiation of the cells was performed.

Conclusion: We provide a simple method for mesenchymal stem cells from human SHED count before culturing. This is important for tissue engineering purposes and for the stem cells banking.

P132
Antibacterial Effects of Propolis on Oral Aerobic Bacteria
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Aim: Propolis has bactericidal and fungicidal activities and is used as an alternative treatment for infections. The aim of this study was to determine which propolis solution had the most in vitro antimicrobial activity on three oral aerobic bacterial cultures and to determine if the solvents used had any such activity.

Material and methods: Propolis was extracted by four solvents: ether, acetone, benzene and methyl-chloride. Enterococcus faecalis ATCC 19433, Pseudomonas aeruginosa ATCC 10145 and Staphylococcus aureus ATCC 25923 were grown overnight at 37°C in Mueller-Hinton Broth at pH = 7.4. The antibacterial activity of propolis extracts was determined by the dilution method. Five dilutions (100, 50, 12.5 and 6.3 μg/ml) of propolis extracts were mixed with Mueller Hinton Agar and poured into Petri dishes. The tested bacteria were inoculated at about 106 bacteria/cm² and incubated at 37°C for 24 h. In order to test the antibacterial effects of solvents themselves, the whole method was repeated using the solvents instead of propolis extracts in concentrations ranging from 60 to 96%. All samples were tested in triplicates.

Results: Results are shown as a minimum inhibitory concentration (MIC). All tested propolis extrCTS demonstrated antibacterial activity on tested bacteria. When dissolved in benzene, propolis showed the best antimicrobial activity (MIC = 6.3 μg/ml) against Pseudomonas aeruginosa and Staphylococcus aureus. Acetone solution of propolis had the strongest antibacterial effect against Pseudomonas aeruginosa. Increasing concentrations of solvents did not have any in vitro antimicrobial activity on tested bacterial strains.

Conclusion: Propolis extracted by non-polar solvents showed significant in vitro antimicrobial activity justifying further clinical investigations.

P133
The Effects of Medicinal Plants on Oral Anaerobic Bacteria
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Aim: Use of medicinal plants extracts as antimicrobial agents has received much attention recently. Therefore, the aim of this study was to determine which medicinal plant aethanolic extracts had the most in vitro antimicrobial activity against selected oral anaerobic bacterial cultures.

Material and methods: Aethanolic extracts of Sinapis, Thymi, Rosmarini, Hyperici, Teucrri, Absinthii, Plantaginis, Salviae, Calendulae, Calami, Malvae, Tiliae, Hipocastani, Bursae, Majoranae and Millefolii were prepared. Cultures of anaerobic bacteria, namely Actinomyces odontolytics ATCC 17929, Streptococcus mitis ATCC 6249, Streptococcus sanguinis ATCC 10556, Eikenella corrodens ATCC 23834, Fusobacterium nucleatum ATCC 25586 and Streptococcus mutans ATCC 25175, were multiplied overnight in Mueller-Hinton Broth at 37°C and at pH = 7.4. Antibacterial activity of medicinal plants extracts was determined by the dilution method. Four dilutions (300, 150, 75 and 37.5 μg/ml) of medicinal plants extracts were mixed with Mueller Hinton Agar and put into Petri dishes and the tested bacteria inoculated at about 106 bacteria/cm². The Petri dishes were put into anaerobic incubator at 37°C for 24 h. All samples were tested in triplicates.

Results: Results are shown as a minimum inhibitory concentration (MIC). Aethanolic extracts of Thymi, Rosmarini and Salviae showed antimicrobial activity (MIC = 37.5 μg/ml) against all investigated oral anaerobic bacterial. Extracts of Hyperici and Calenduiae inhibited the growth of all investigated bacteria except Streptococcus mutans. Only the extract of Majoranae at MIC = 130 μg/ml had the inhibitory effect on the growth of Streptococcus mitis.

Conclusions: Certain medicinal plants have shown in vitro antibacterial activity against known oral anaerobic pathogens which justifies further clinical investigations.
P134
Knowledge and Compliance with Post Exposure Management among Dentists
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Aim: To assess the knowledge and determine the level of compliance with post exposure management protocol among dentists.

Materials and methods: A descriptive cross-sectional study was done with a study population of 124 dentists. Using self-administered questionnaires, information was sought on knowledge of managing exposures—first aid and prophylaxis as well as compliance when exposed. Permission was obtained from the ethics committee.

Results: 112 (90.3%) of the 124 questionnaires distributed were completed. Majority of the respondents (74.2%) knew the correct steps to take in managing exposures however, a proportion of them were not familiar with first aid procedure when exposed. 51.8% of the respondents had experienced an exposure of which only 20.7% reported and 27.6% requested blood tests for the source patient(s).

Conclusion: The level of compliance with post exposure management is inadequate therefore; there is a need to update the knowledge and device methods of encouraging compliance with post exposure management among dentists.

P135
Infection Control Practices for Trainee Dentists in Japan
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Introduction: In Japan, after passing the national board dental examination, dental graduates must train for a further year as a trainee dentist. This training can be in the dental hospital and private dental clinics. The aim of this study was to determine the compliance of the infection control procedures of trainee dentists in the two different environments.

Subjects and methods: A questionnaire about infection control procedures was completed by 58 trainee dentists. We asked about the practice of standard precautions of infection control procedures in the dental hospital (The Nippon Dental University at Niigata) and in private dental clinics. A Likert-type scale was used to gauge positive responses as “Always” and “Usual” and negative responses as “Sometimes” and “Never”.

Results and discussion: The trainee dentists reported wearing gloves in the hospital (100%), in clinics (97%). Changing their gloves between patients in the hospital (100%), in clinics (66%). They washed hands before treatments in the hospital (100%), in clinics (88%). Take gloves when writing medical records in the hospital (95%), in clinics (74%). Finally, 25% of trainee dentists responded that they were not able to perform infection control procedures in private dental clinics.

Private dental clinics are usually small scale with a few full-time dentists. There may be differences in the standards of the infection control procedures between the dental hospital and private dental clinics. The training environment has a significant effect on the compliance of infection control procedures.

P136
Oral Cavity Mucosa Cytogram Peculiarities in Patients with Lichen Planus
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Objectives: To give cytological evaluation of oral cavity mucosa epithelium state in patients with lichen ruber planus.

Materials, methods and treatment: The object of our research was cheek tunica mucosa swabs of 20 healthy patients and 40 ones with erosive lichen ruber planus. Patients at the age of 32–47 were under study. Swabs were dried, fixed in spirit-acetone (1:1) and May-Grunwald and Romanovsky-Himsa stained. Combination therapy with liquid extract “Leyar” and phototherapy (helium-neon laser radiation of 20 mW output power) were used. Epithelial cells in various stages of differentiation, contaminated epithelial cells, dystrophically changed ones, epithelial cells with neutrophil invasion, mononuclears, segmentonuclear neutrophils and lymphocytes per 1000 cells were calculated in stained swabs. Basing on the cytogram results in order to evaluate the proliferation and differentiation processes of cheek tunica mucosa epidermum “left shift” index and “epithelial cells differentiation” index were calculated. The obtained data analysis and evaluation of credibility of differentiating averages were done using Student’s test. Indexes changes were considered to be credible for p < 0.05.

Results: We observed considerable increase of neutrophils, monocytes and dystrophically changed epithelial cells in patients with erosive lichen ruber planus. Epithelial cells proliferation growth was also seen. The applied method has strong therapeutic effect. Most indexes have normalized by the 14th day of the session.

Conclusion: Oral cavity mucosa cytogram analysis in patients with erosive lichen ruber planus before and after the treatment can be used as a sensitive diagnostic test and for effectiveness evaluation of its treatment.

P137
Non-Syndromic Multiple Supernumerary Teeth: A Case Report
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Aim: Supernumerary teeth may be defined as any teeth or tooth substance in excess of the full complement of primary and permanent teeth. Multiple impacted supernumerary teeth are rare. This case report presents a case with nonfamilial and nonsyndromic multiple supernumerary teeth.

Case presentation: Nine-year-old male patient referred with the chief complaint of the unpleasant appearance of his anterior teeth to Department of Pediatric Dentistry, University of Ondokuz Mayis, Turkey. Medical and family histories were noncontributory. Extraoral findings did not show any abnormality. Intraoral examination revealed many deep caries lesions and a supernumerary tooth between his maxillary central incisor teeth. Radiographic examination revealed the presence of 11 supernumerary teeth in all four quadrants. The proposed treatment plan consisted of extraction of the erupted and unerupted supernumerary teeth in order to immediate initiate orthodontic treatment. The supernumerary teeth were surgically removed and sent for histopathological examination, which revealed features which are suggestive of odontoma of the compound type. At present the patient is undergoing orthodontic treatment and his regular clinical and radiographic follow ups scheduled.

Conclusion: This case highlights the treatment options of a patient with multiple supernumerary teeth and the need for multidisciplinary planning and treatment.

P138

Early Non Invasive Detection of Premalignant Lesions of Oral Mucosa

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Aim: The aim of our report is to familiarize medical public with the possibility of early detection of malignant and premalignant lesions of the oral mucosa and to evaluate our experience with the method of light-induced natural autofluorescence of tissues.

Materials and methods: Carcinoma of the oral cavity is a serious and relatively common disease, which is often overlooked and underestimated by the lay and professional public. For this reason, we encounter bad or late diagnosed neoplastic disease of the oral cavity in our practice. Today’s medicine offers several methods for early diagnosis of malignant neoplasms of oral mucosa. One of the methods – natural tissue autofluorescence provided by apparatus Velscope – is used at our clinic. Principles of the method and our clinical experience with Velscope device are summarized in our poster.

Results: Natural autofluorescence method seems to be beneficial for increasing success in early detection of malignant diseases of oral cavity, as well as for allowing radical surgery. For correct evaluation of the results of investigations using this method, it is required to have certain experience, because of the high sensitivity and low specificity of this examination.

Conclusion: By using the method of natural tissue autofluorescence we can early detect lesions, that are hard to recognize under polychromatic day light. With help of this device, we can also determine the range of safety margins in radical surgery or find the ideal biopsy sampling point. This method is also suitable as a dispensarizing method by capturing control images.

P139

Chronic Conditions’ Policies: Oral Health, A Felt Absence

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Introduction: Dental caries is the most common non-communicable disease, affecting more than 90% of population. All other mouth diseases have significant impacts on general health, wellbeing and productivity. This research aimed to identify how oral health is considered in elaboration of public policies for non-communicable diseases.

Methods: This was a cross-sectional quantitative research and data were collected between 12/05/2012 and 12/10/2012 in WHO website, “media centre” section, with the expression “non-communicable diseases”. It resulted in 12000 publications. Filtering in advanced search, asking for “Find results with all of the words, 100 results, Language English, File Format.pdf, Occurrences in the title of the page, Domain who.int, Sort by date” it produced 45 publications. Analysis occurred from 12/10/2012 to 12/15/2012, using the tool “Find” on Windows 7 to identify the key words: oral health, dental caries, and periodontal disease.


Discussion: The inexpressive presence of “oral health” (7) could be credited to a wider approach of health, but what about “dental caries” (just 4) and “periodontal disease” (0), the most prevalent oral non-communicable diseases? The undisputed leadership that WHO plays in combating diseases, through admittedly efficient health policies, have already brought many benefits to millions of people. Partnerships with several organizations from different nature seem highly positive. But it is undeniable that oral health has been overlooked in policies to combat non-communicable diseases, particularly cardiovascular diseases and diabetes, which have more interactions and oral manifestations.

P140

Assessment of Dental Anxiety among Dental Students during Pre-Clinical and Clinical Year

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Aim: Anxiety is a response to a perceived threat or danger and is recognized as a significant barrier to the utilization of oral health care service. The purpose of this study was to evaluate the factors...
associated with dental anxiety and to assess the most provoking stimuli during the dental treatment among dental students in their pre-clinical and clinical years.

**Materials and methods:** All data were collected by self-report questionnaire. One hundred sixty-six dental students completed a 2-section questionnaire which consists of sociodemographic information including age, gender and frequency of dental visits and a second section in which students answered questions about factors related to dental anxiety. Chi-square test was used in statistical analysis.

**Results:** The most provoking stimuli were “seeing the needle”, “the noise of dental equipment” and “the view of dental equipment” among pre-clinical students respectively. Post clinical training values were significantly decreased (p = 0.0001, p = 0.0049, p = 0.0005). No statistically significant difference was observed between genders according to the pre-clinical year questionnaire answers. Moreover statistically significant differences in anxiety values were found at female students between clinical and pre-clinical years.

**Conclusions:** According to our findings we suggest that the change in the reported dental anxiety of the students during the years of dental studies in the present study may be related with the increased dental education and clinical training that the students acquire throughout the dental school.

**Theme: Implantology: Immunology**

**P141**

**Oral Lichen Planus in Relation to Transaminase Levels, Hepatitis C and B Virus**

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**Aim:** The aim of this study was to evaluate the relationship of transaminase levels, hepatitis C and hepatitis B virus infections in patients with oral lichen planus (OLP) and to compare to healthy controls.

**Materials and methods:** The study protocol was approved by the Local Committee of Research and Ethics of Marmara University. Thirty patients with OLP and 30 age-gender matched healthy controls were participated in the study. All patients were subjected to routine blood test and the estimation of serum glutamic oxaloacetic transaminase (SGOT) and serum glutamic pyruvic transaminase (SGPT), detection of anti-HCV antibody and hepatitis B surface antigen (HbsAg) by using the enzyme immunoassay. The data were statistically analyzed using Student-t, Mann-Whitney U and Chi-Square Fischer’s Exact tests.

**Results:** The difference between OLP patients and healthy controls of SGOT, SGPT, anti-HCV antibody and HbsAg into group was not significant (p > 0.05).

**Conclusions:** This study identified that there was no association between OLP and elevated SGOT/SGPT levels, hepatitis C and/or hepatitis B virus.

**Theme: Implantology: Implantology**

**P142**

**The Biomechanical Interest of Damping Materials in Dental Implantology**

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**Aim:** Finite element analysis (FEA) has been frequently used to study the loading situation of dental implants and bone resulting from the fixation of non-passively fitting restorations. This work presents a numerical study performed with FEM of new dental implant system.

**Materials and methods:** A conventional dental implant system was redesigned and an artificial periodontal ligament was interposed between the implant and the bone. The aim was to attenuate the stress in the bone surrounding the implant. The new system was assessed and the interface stresses compared with the ones provoked by the conventional implant.

**Results and conclusion:** In general, the novel dental implant provoked lower interface stresses due to the stress shielding effect of the artificial periodontal ligament.

**P143**

**An Alternative Healing Abutment Production Technique for Deeply Placed Implants**

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**Aim:** A healing abutment is placed into the implant to help the soft tissue healing around the implant after first or second stage surgery. Conventional prefabricated gingival formers are designed for a machined abutment and are produced in several lengths and project through the soft tissue into the oral cavity. Prefabricated healing abutments may fail to provide support for the supracrestal soft tissue in deeply placed implant sites. In some clinical cases, there is a need to be placed the implant deep subgingivally due to bone availability. Especially in patients with cleft palate and patients with severe bone resorption, the overlaying soft tissue may be too thick to be transversed by the conventional highest length healing abutment. If implants are placed deeply; an alternative technique can be used to achieve ideal tissue form.

**Case:** A 20-year-old male patient presented with edentulous mandible and operated maxilla for cleft palate. Four tissue level
implants were placed in left and right molars region and tuber region of operated edentulous maxilla. During the prostodontic phase, a custom healing abutment was planned. Because the implant was deeply placed. In this technique, implant transfer piece was used rather than healing abutment. The implant transfer piece was screwed on suitable analogues to ease handling during restoration procedures. The implant piece was fabricated using flowable composite resin. To create a strong bonding between composite and the implant transfer piece, circumferentially retentive grooves was attained and used adhesive bonding system.

**Conclusion:** The new custom healing abutment was produced 4 mm longer than the highest prefabricated healing abutment which was belonged to this implant system.

P144
Zigomatic and All on Four Implant Supported Rehabilitation: sEMG Study
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**Aim:** The aim of this clinical study was to evaluate the muscular function of patients totally rehabilitated with Zigomatic (maxillary) and all on four (mandibular) implants, compared with those having natural dentition and complete denture.

**Materials and methods:** The present research was approved by the Ethics Committee and evaluated 72 patients, divided into three groups. The implant group was composed by 24 patients (12 men, 12 women; mean age 57.8 years) totally rehabilitated with Zigomatic (maxillary) and All-on-Four® (mandibular) implant-supported prostheses. The dentate and denture groups consisted of 24 subjects each, paired with members of the Implant group according to age and gender. Surface Electromyography of masseter and anterior temporalis muscles was carried out during clenching, nonhabitual and habitual chewing and rest. All values were standardized as percentage of a maximum voluntary contraction. Inter-group comparisons were made using ANOVA and Tukey post hoc test (SPSS 17.0). Significance level was set at $p < 0.05$.

**Results:** No one statistical difference was found between Implant and dentate group. The sEMG activity of masseter and anterior temporalis muscles of denture group presented statistically significant differences ($p < 0.05$) from those of denture and implant groups.

**Conclusions:** Patients using implants and dentate patients demonstrated similar sEMG values, showing that Zigomatic an All On Four implants-supported prostheses can be considered a good treatment option for oral rehabilitation in edentulous patients.

P145
Comparative Study of Two Mandibular Partial Implant Overdenture Designs
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**Objective:** Comparison between two mandibular implant overdentures of class II Kennedy classification.

**Method:** Fourteen male patients were selected with age ranging from 30 to 45 years divided into two equal groups. Group I received a mandibular removable partial over denture retained with implant abutment at the first molar region and with extra coronal attachment to the first premolar. Cross arch stabilization was made by using double Aker clasp on the first and second molars of the opposite side. Group II received a unilateral mandibular removable partial over denture retained with implant abutment at the first molar region and with extra coronal attachment to a splinted first premolar and canine. Patient satisfaction, clinical and radiographic evaluations were carried out at regular appointments up to 1 year from implant loading.

**Result:** There was insignificant increase in the pocket depth and gingival recession, insignificant decrease in the perio test values and plaque index around implants and abutments and insignificant increase in the marginal bone loss around implants and abutments in both groups. All patients strongly disagreed the high cost of the treatment. Group II patients were more satisfied regarding aspects of the patients’ comfort and phonetics.

**Conclusion:** Unilateral removable partial denture was more comfortable and more better with speech. The use of dental implant as a distal abutment in class II Kennedy classification reduces all the movements of denture base and results in better healthy condition for the gingival and periodontium of the abutment tooth than when using conventional partial denture.

P146
Adhesion of HMS0014 Cells on Titanium Discs with Surface Modifications
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**Purpose:** The present study evaluates the microenvironments of titanium (Ti) discs having similar surface modifications of prevalent dental implants to acquire an optimal osseointegration of human bone marrow-derived mesenchymal stem cells, therefore contributes to an in vitro study of the dental implant therapy.

**Materials and methods:** Cell proliferation/differentiation of HMS0014 Yub62b cells (Riken BRC), and mineralisation of the ECM in monolayer culture were studied. Subsequently, the HMS0014 cells were GBR-engineered to initiate osteogenesis on either 99% Ti (JIS type 4; SPL, Thommen Med/Morita) or Ti alloy (Ti-6Al-4V; anodic oxidation (AO), hydroxyapatite coating (HA); JMM) discs modified with different surface substrates (Disc-SPL, Disc-AO, Disc-HA). The histology of attachment onto the substrate, extension and intercellular contact of the HMS0014 cells under inducing condition (POWEREDBY10/AA+β-GP+DEX; 14 days) were studied with fluorescence light microscopy (BIO-REVO BZ-9000; Keyence) and SEM (H-4100; Hitachi).

**Results:** The SEM demonstrated that the spherical-to-polygonal $(d = 10–40 \mu m)$ HMS0014 cells proliferated and differentiated...
Osseointegration of HMS0014 Cells in Cellmatrix I-A around Ti Implants

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Purpose: We have investigated culture of HMS0014 Yub621h cells (Riken BRC) on titanium (Ti) discs, and revealed that (i) ECM mineralisation was initiated since day 1 and became markedly deposited during days 7–14, (ii) 3-D culture acquired more Ca and OC volumes, and (iii) The cells were more expansively adhered on anodic-oxidized (AO) Ti discs. In this study, we cultured clusters of HMS0014 cells in a collagen scaffold on AO Ti implants (AO-IPs) and studied osseointegration by the GBR concepts in vitro.

Materials and methods: Straight root-shaped AO-IPs (FINAX; materials and methods) were laid in dishes paved with Cellmatrix Type I-A Gel (Nitta Gelatin; layer I), cultured together with the cell cluster (immature HMS0014 + Cellmatrix; layer II) and sandwiched with another Cellmatrix layer overlaid with POWERBY10 (AA + β-GP + DEX, 21 days; layer III). AO-IPs with the growing peri-IP tissue (layers I-III) were either embedded (Technovit 7200; Heraeus Kulzer) for ground-section by the Cutting-Grinding Technique (EXAKT BS-300CP-A/MG-400Cs; MEIWAFOsis) or cryosectioned (CM 3050s; Leica); the specimens were prepared for the LM (BX41/FX380; Olympus). Furthermore, the peri-IP tissue was prepared for the conventional TEM (H-7100; Hitachi).

Results: Contact osteogensis was commenced with osteoconduction of HMS0014 cells and sedimentation of cement lines. In the peri-IP GBR tissue, the distribution of elongated polygonal Ob-like cells, invasion of the ECM and appositional collagen-related mineralisation among/between the warp/weft of the 3-D collagen meshwork were demonstrated.

Conclusions: We cultured a tissue-engineering material by growing HMS0014 cells within a 3-D collagen gel scaffold on AO-IPs, and elucidated augmentation of IP osseointegration by the GBR.

Effect of Surface Treatment of the Implant Collar Area on the Crestal Bone Resorption: A Comparative Study in Mandibular Implant-Denture Cases

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The present study was designed to compare crestal bone resorption, up to 1 year, around immediately-loaded endosseous implants supporting mandibular implant-dentures, with different surface treatment of the implant collars (polished vs. sandblasted), using CAD/CAM-based surgical guides, flapless implant surgery, and split-mouth design.

Materials and methods: Ten healthy completely edentulous patients (eight males and two females) were selected, with their ages ranged from 58 to 65 years. Informed consents were signed by all patients. Pre-operative CBCT was performed for all patients and their mandibular stone models as well. CAD/CAM technology was used to fabricate stereolithographic surgical guides using data collected from CBCT.

According to split-mouth design, right canine areas received implants with polished collar, while left canine areas received implants with sandblasted collar. All implants were of the same length, diameter, and collar height. Implants were placed using punch technique and were immediately loaded over ball attachments.

Radiographic assessment of crestal bone resorption was carried out using standardized periapical digital radiographs. Readings were statistically analyzed using Wilcoxon-Signed Rank test.

Results: Statistical analysis of the results showed more crestal bone resorption around the implants with polished collar starting from the 3rd month of evaluation, however, no clinical significance difference was reported.

Conclusion: Surface treatment of implant collar area minimizes the rate of crestal bone resorption, specially when used in combination with punch technique, CBCT, and CAD/CAM technology. Split-mouth design research design is highly recommended in clinical trials for more accurate results, reduction of bias and cost, and to save resources.

Regression Analysis of the Findings 1 year After Implant Placement

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Aim: In a clinical-microbiological and prospective study 108 patients were assigned to four groups [G] (G1: no residual teeth
with probing depth [PD] >3.5 mm, G2: at least one [alo] PD of 3.6 to <6 mm, G3: alo PD of 6–8 mm, G4: alon PD >8 mm) and received 194 implants (88 in the upper jaw, 106 in the lower jaw). One year after implant placement, 81 patients (74.2% implants) were reassessed. 95.5% of the implants in the upper and 91.1% in the lower jaw were free of plaque and in nearly all cases free of inflammation.

**Material and methods:** All findings before and after implant placement (dental visit [V] 3, V8) and after 1 year [V11] underwent a regression analysis using the method “step-wise” to determine influence factors and power (Beta) on probing depth [PPD] of the patients.

**Results:** The model with 15 variables proved to be significant and explained PPD at 82.7%. Thus, the regression equation for PPD was: y = 2.386 + 9.619 × 10^{-9} + 0.127V3 total bacterial count [TBC] deepest periodontal pocket + 0.591past periodontal treatment +0.127V3 Community Periodontal Index [CPI] 17/16 + 0.42V3 maxillary prosthetic status +0.032V11 status crown 24 + 0.189V11 status root 43 + 0.045 × 10^{-6}V11 F. Nucleatum in implant sulcus +0.071V3 CPI 26/27 + 0.069V3 status crown 15 + 0.412V3 CPI 31 + 0.295V3 status root 41 + 0.180V11 status root 46 + 0.187V3 status root 35 + 0.164V8 attachment loss 47/46 + 0.120V11 smoking.

**Conclusion:** The highest influence on PPD exerted the maxillary prosthetic status at V3 (Beta = -0.549), the CPI 17/16, TBC of the deepest periodontal pocket and a past periodontal treatment.

P150

**Retention and Stress Distribution in Implant Retained Overdentures**

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**Objective and purpose:** Osseointegrated implants have been used to improve denture support, stability and retention. Retention should not be the only factor to consider when designing an implant-retained overdenture. As a patient functions with an implant-retained overdenture, loads are transmitted to an intact bone surrounding the implants. The aim of this study was to evaluate the relationship between retention and stress distribution in overdentures retained by three implants.

**Material and methods:** A photoelastic model was fabricated with three parallel, vertically oriented, screw-type implants embedded in the interforaminal region. Three different attachment systems were tested on the model (Vario soft bar with VSS yellow matrix, galvano bar and clear locator attachment with 5 lbs retention). Subsequent stresses in the supporting structure were monitored using a polariscope, and photographs were taken in order to evaluate stress. In addition, each design was attached to a universal testing machine and subjected to 10 consecutive retention pulls in order to evaluate retention. Data were subjected to analysis of variance and t tests to determine differences.

**Results:** Retention force ranged from 26.58 to 54.32. The clear locator attachment resulted in higher retention as well as higher stress values in comparison to the other systems tested (p < 0.001). The results of this in vitro study suggest that choice of attachment affects the clinical success of implant-retained mandibular overdentures.

**Conclusion:** Higher retention value and stress was found at prosthesis with locator attachments. 3-Splinted designs were shown lower stresses than locator attachment.

P151

**Bone Level 2.8 mm Implants Connected Bridge Placement on the Anterior Mandibula**

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**Case:** A 57 years old female patient came with removable partial denture replaced lower anterior teeth that were missing several years ago. The patient has been wearing partial denture for over 2 years, but complaining of unesthetic appearance, less comfort in speech and stomatitis that sometimes occurred on the bottom of the tongue. In this case, four pieces bone level implants with diameter of 2.8 and 14 mm height placed subcrestal on regio 43, 42, 32 and 33. The abutment and six unit bridge connected with four pieces implants inserted 5 months later.

**Conclusions:** These treatments fulfilled patient’s expectancy both appearance and speech function.

P152

**Laser-Induced Implant Surface Decontamination: Evaluation of In Vitro Models**

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**Aim:** To critically evaluate in vitro studies assessing the efficacy of dental implant surface decontamination by laser therapy, and to report on lasers that are likely to yield maximal decontamination and minimal surface morphological alterations.

**Materials and methods:** Pubmed and Medline via OvidSP electronic databases were used to search for articles relating to the use of lasers in the decontamination of titanium specimen surfaces. Clinical studies, case reports, case series, review articles, animal models and studies that did not include titanium specimens were excluded. Study selection was carried out by two authors independently and cross-checked through abstract viewing; data abstraction was achieved following full-text viewing.

**Results:** 16 articles were included with no discrepancies in study selection or data abstraction to be contended. Er:YAG laser induced decontamination over a large power range; meanwhile, carbon dioxide and GaAlAs diode lasers demonstrated differential microbial decontamination capacities indicating a potentially lower efficacy against a multi-microbial biofilm. Contrary surrounded Er:YAG’s comparative efficacy to alternative treatment modalities and no comparative studies were available for the other
lasers; similarly, the likelihood of surface alterations occurring secondary to irradiation was controversial and depended on laser type and settings.

**Conclusions:** Outcomes varied between the included studies with little consistency in laser decontamination capacity or surface alteration potential. This may be due to researchers employing various test specimens, contamination methodologies, irradiation settings and outcome measures leading to limited study comparability. More investigations are required to provide guidelines for using laser therapy which has demonstrated promising results in vitro trials to date.

**Theme: Implantology: Oral Pathology**

**P153**

**Intraoral Localized Reactive Hyperplastic Lesions in the Turkish Population**

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**Aim:** This retrospective study aimed to contribute to the literature by investigating the types and distribution of intraoral localized reactive hyperplastic lesions (LRHL) in the Turkish population.

**Methods:** The histological diagnostic records of the Department of Pathology at Cumhuriyet University were reevaluated for 210 patients who had been treated for lesions from 1987 to 2008. The lesions were classified into four groups: focal fibrous hyperplasia (FFH), pyogenic granuloma (PG), peripheral giant cell granuloma (PCCG), and peripheral ossifying fibroma (POF)–and were analyzed for histological diagnosis, age, gender, and site.

**Results:** The total of 210 lesions consisted of 82 (39.05%) FFH, 79 (37.62%) PG, 41 (19.52%) PCCG, and 8 (19.52%) POF. Age for all cases ranged from 6 to 80 years (mean age was 39.5 ± 16.8 years) with a female-to-male ratio of 1.1:1.

**Conclusions:** Despite some discrepancies, the characteristics of LRHL of Turkish patients are in line with those of patients from other countries according to lesion type, site distribution, and age and gender of patients.

**Theme: Implantology: Oral Surgery**

**P154**

**Impacted Lower First Premolar Associated with Supernumerary Teeth**

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**Aim:** Supernumerary teeth often causes disturbances in the eruption of its associated tooth. Supernumerary teeth occur in the primary and permanent dentition. This case report documents a 12-year-old-girl with a supernumerary tooth located in the mandible, which caused the impaction of the right lower first premolar.

**Material and methods:** Twelve-year-old-girl was referred to our clinic due to the failure of the right lower first premolar to erupt. Intraoral examination revealed a permanent dentition period, and all teeth except for the right lower first premolar was present in the mouth. Extraoral examination revealed no abnormal signs in gingiva, buccal tissue and alveolar bone of the right mandible. A lower first premolar in the vertical position and covered with primary and supernumerary teeth was determined to be present through panoramic and periapical radiographs and extracted in a surgical operation. After surgery, orthodontic treatment began with the fitting of upper and lower preadjusted edgewise appliances of 0.018-in slot. The arches were banded and bonded, and the teeth leveled and aligned.

**Results:** The impaction of the right lower first premolar was successfully brought into alignment through surgery treatment and orthodontic traction.

**Conclusion:** Detection and removal of a supernumerary tooth associated with an impacted tooth might have contributed to the favorable results for establishing acceptable occlusion.

**P155**

**Surgical Approaching Of Endodontics Failure Teeth**

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**Aim:** The aim of this study is to analyze the difference of success by retreatment with orthograde and retrograde filling method of endodontically failure teeth.

**Material and methods:** In a period from 2010 to 2011 year were surgically treated 48 patients (27 males and 17 females) in age from 11 to 68 years old. 48 surgically treated teeth with periapical lesions were divided into two groups. First group (control group) was compound from 24 teeth with periapical lesions filled by orthograde way. Second group (study group) was also compound from 24 teeth with periapical lesions filled by retrograde way, because they have intra radicular restorations or metal ceramic crowns.

**Results:** After 12 months, bay all patients was made X-ray control, and by first group(control group) were evaluated eight cases with complete healing, ten cases with unfinished healing, four cases with suspect healing, and two failure cases. By second group (study group) were evaluated 14 cases with complete healing, six cases with unfinished healing, four cases with suspect healing. Concerning the postoperative healing of lesions, by X-ray controle there was no statistically significant difference between two groups after 12 months (p = 0.59).

**Conclusions:** From this study, we can conclude that application of a retrograde filling with surgical intervention-apicectomy, could
bee considered like a minimal invasive procedure, which has positive effect by postoperative clinic results.

**P156**

**Excision of Benign Soft Tissue Formations with Er:Yag Laser and Reparative Process Follow up with Thermal Imaging**

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**Aim:** The usage of Er:Yag lasers in the surgery has proven advantages: lack of pain, reduced bleeding, possibility of haemostasis. A raise of the temperature is an indicator of inflammation or of a reparative process. The purpose of our survey is to assess and compare the date collected with the camera for thermal imaging (FlirA320 with resolution of 0.06°C) about the reparative process after excision of benign formations in the oral cavity with Er:Yag laser.

**Material and methods:** To all 15 participants so far were made photographic and thermal pictures before the excision, immediately after it, on the 3rd and on the 7th day.

**Results and conclusion:** The results showed that there was no raise in the local temperature with more than 0.8°C during the reparative process in the 7-day period of follow up.

**P157**

**Implants and Bisphosphonate Related Osteonecrosis of Jaws (BRONJ)**

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**Introduction:** Bisphosphonates are widely used in the management of metastatic disease to the bone and in the treatment of osteoporosis. BRONJ is a serious condition that has been reported by dental practitioners and physicians in cancer and osteoporosis patients on bisphosphonate therapy.

**Materials and methods:** This is a computer based research that includes Medline and Pubmed databases. Out of 156 articles, eight of them were clinical trial and 38 of them were review article.

**Results:** People who receive frequent, high dose of bisphosphonates over long period of time and have periodontal disease, poor oral hygiene and invasive oral surgery such as implant are the most one who is at the greatest risk for developing BRONJ.

**Conclusion:** Because of broad dental implant usage, dental practitioners must ask patients specifically about bisphosphonates as a threatening drug. BRONJ is a serious condition that has been reported by dental practitioners and physicians in cancer and osteoporosis patients on bisphosphonate therapy.

**P158**

**Multidisciplinary Rehabilitation of Limited Interocclusal Spaces: A Case Report**

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**Aim:** Prosthetic management of partial and total edentulism can be challenging with the presence of limited interocclusal space. The extrusion of opposing teeth combined with the alveolar extrusion of the edentulous areas reduces the space needed for fabricating a removable or fixed prosthesis when edentulous areas are present in the maxilla. This clinical presentation describes the treatment provided to a patient who presented with limited interocclusal space because of bone development disorders.

**Case:** The case who had partial edentulism was rehabilitated with extraction and alveoloplasty. The mandibular left first premolar, maxillary left and right first premolars were extracted and the maxillary right and left posterior alveolar crest was reduced by alveoloplasty. And also mandibular right posterior area was grafted with autogenous bone collected from the maxilla because of inadequate alveolar width. After gaining adequate space, prosthetic rehabilitation was completed with removable partial denture.

**Conclusion:** During the follow-up period, the patients chewing functions and physical appearance improved, and no complications occurred.

**P159**

**Laser Therapy on Cultured Osteoblasts Submitted to Sodium Alendronate**

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**Introduction:** The management of bisphosphonates related osteonecrosis of jaw (BRONJ) remains a challenge. Literature describes different forms of treatment, almost all of the studies agree in minimal invasive procedures. Then, the laser phototherapy (LPT) using red wavelength has shown positive effects on BRONJ lesions healing.

**Objective:** This study aimed to evaluate the effect of LPT on the viability and proliferation of osteoblasts (OSTEO1 lineage) submitted to sodium alendronate.

**Methods:** Cells stayed in contact with DMEM containing sodium alendronate for 24 h, after this period cells were irradiated (6 J/cm²), using a continuous diode laser (InGaAlP, 660 nm) in punctual and contact mode, 40 mW, spot size 0.028 cm². Two irradiations with 6 h-interval were performed. Cell viability and proliferation were determined with the MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide) reduction assay in three different periods 24, 48 and 72 h after first irradiation.

**Results:** Controls and cultures treated with sodium alendronate and LPT presented cell viabilities significantly higher than those of cultures solely treated with alendronate.

**Conclusion:** The alendronate showed to be cytotoxic to osteoblast in culture. The LPT in the parameter tested was able to reverse the cytotoxicity of the alendronate.
Glandular Odontogenic Cyst: A Rare Case Report
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Introduction: Glandular Odontogenic Cyst (GOC) is a rare developmental cyst of jaws, which suggests an origin from the remains of dental lamina. GOC was first reported as a sialo-odontogenic cyst by Padayachee and Van Wyk in 1987. Gardner et al. described it as a glandular odontogenic cyst in 1988 after understanding there is no relationship between salivary gland and cyst. In 1992, World Health Organization classified the lesion as a developmental odontogenic epithelial cyst and accepted GOC as the preferred term.

Magnusson et al. observed that GOCs account for only 0.012% of all cysts seen on the oral cavity. To our knowledge, only 111 cases of GOC has been reported in the literature.

GOC has a slight male predilection and occurs primarily in middle-aged patients. Clinically, the most common site of occurrence is anterior mandible. GOC may be asymptomatic or may cause pain, slow-growing swelling and tooth displacement. Radiographically, GOC appears as a well-defined multilocular or unilocular cystic lesion of jaws that often causes expansion, thinning, erosion or perforation of the cortical plates.

Case: In this study, clinical, radiographic and histopathological evaluation and treatment of a rare case of GOC with maxillary impacted canine tooth in a 39 years old female patient is presented. She was admitted to our clinic with the complaint of swelling in the anterior maxilla which was noticed 7 months back and rapidly attained the present size. According to the patient’s relatives’ report (because of the patient was mental retarded); this growth had appeared after extraction of tooth 21. The patient was taken to Ear-Nose-Throat clinic about 3 months ago. After a biopsy she was not treated surgically, only an antibiotic had been prescribed. The growth had not been regressed, contrarily it continued enlarge. Intraoral clinical examination showed a swelling extending from teeth 11 to 25 obliterating the buccal sulcus, measuring 6 × 4 × 3 cm with a firm and erythematous surface. The CT scan revealed an unilocular radiolucency extending to basis of orbita and nose. Surgery was performed under local anesthesia. The tissue was removed and the histopathological diagnosis was a CGCG.

Conclusion: Giant cell granuloma outside the jaw was a non-neoplastic lesion, and extremely rare. It was somewhat difficult to make a correct diagnosis. Combining the clinical data and pathological feature were more helpful to the diagnosis.

Bilateral Diagnosis of a Central Giant Cell Granuloma: A Case Report
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Introduction: Central giant cell granuloma (CGCG) is a non-neoplastic in intraosseous lesion of unknown etiology. They affect females more than males with the mandibular anterior region being the most common site of occurrence. Clinically CGCG’s are slow growing, asymptomatic, which do not recur and as aggressive lesions, found in younger patients, painful with rapid growth, often causes root resorption and tendency to recur. Definitive diagnosis can be made only histologically.

Case: A 36 year old female patient was referred to our clinic with a chief complaint of swelling in the anterior maxilla which was noticed 7 months back and rapidly attained the present size.
Multiple Eruption Cysts: A Case Report

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Introduction: Eruption cyst (EC) is a benign cyst associated with a primary or permanent tooth in its soft tissue phase after erupting through the bone.

Case presentation: 1-year 5-month-old male baby was referred by his parents to Department of Pediatric Dentistry, University of Ondokuz Mayıs, Turkey, due to 1 × 1 cm diameter soft, smooth and bluish four lesions in the area of the primary first molar teeth of maxilla and mandibula. After the needle aspiration biopsy, incision and exposure of the associated teeth was performed. Follow-up examinations were performed 15 days later the surgery. By the end of the first year, the lesions had disappeared completely and the primary first molar teeth erupted to oral cavity without pathology.

Conclusion: It is clinically significant in that knowledge among general dentists is very essential regarding this developmental disturbance to reach the correct diagnosis and to provide proper treatment.

Iatrogenic Paresthesia after Implant Surgery: Case Report
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Introduction: Dental implant applications are frequently used in reconstructions of edentulous maxilla and mandibula. The risks of injury of the branches of the mandibular division of the trigeminal nerve (inferior alveolar nerve, lingual nerve, and mental nerve) are known complications of mandibular implant applications. Especially in atrophic cases, preoperative evaluation using advanced imaging modalities such as dental volumetric tomography scans can assist in localization of inferior alveolar canal and foramen mentale, thus decrease complication rates.

Case: Treatment of the patient who has sustained a nerve injury from dental implant procedures must be done immediately in order to treat neurosensorial disturbances.

Assessment of Preemptive Analgesia for Third Molar Surgery
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Aim: Preemptive analgesia is a method used to manage postoperative pain by preventing central sensitization. However, the preemptive effects on postoperative oral surgery pain is still controversial. We investigated the preemptive analgesic effect for third molar surgery by reviewing the latest randomized controlled trials (RCTs).

Methods: An electronic database was accessed to search for all relevant articles of RCTs published between 1996 and 2012. Characteristics of studies such as the study design, active drugs, method of preemptive analgesia and results were extracted from original articles and evaluated.

Results: In many studies, pre-administration of NSAIDs before extraction demonstrated that the severity of postoperative pain was reduced beyond the expected effect time. On the other hand, some studies reported that postoperative administration immediately after extraction was more effective than pre-administration. This suggests that peripheral sensitization caused by reactive inflammation following the tooth extraction and secondary central sensitization are more important factors than direct central sensitization caused by surgical tissue damage.

Conclusions: For the removal of mandibular third molars, central sensitization can be inhibited by the presurgical administration of analgesics. Re-administration of analgesics after extraction to inhibit postsurgical peripheral sensitization is a more successful method for suppressing postoperative pain. Acid NSAIDs are effective but there is a concern about adverse events. Accordingly, for presurgical administration, acetaminophen can be used since it has less of an anti-inflammatory effect and a limited COX inhibition effect. For postsurgical administration, a COX-2 inhibitor with anti-inflammatory effect is recommended.

Theme: Preventive Dentistry: Caries

P168
Effect of Temporary Cements on Microleakage of Composite Restoration
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Purpose: Cements such as zinc oxide eugenol have been frequently used as temporary restorations, but, the presence of eugenol in cement can negatively affect the seal of the permanent restorations like composite resin.

Aim of this study was to evaluate the microleakage of composite restorations following pre-treatment with ZOE temporary cements of different powder: liquid ratios and compare them with eugenol-free temporary cement.

Materials and method: Class V cavities were prepared on the buccal surfaces of 32 freshly extracted human premolars. Teeth were divided into four groups of eight each. Gr. I-Received no temporary restoration. Groups 2 and 3 filled with Type III ZOE mixed at P: L ratio of 10: 1 g and 10: 2 g, respectively. Gr 4: Received eugenol-free cement (RelyX Temp NE). After 1 week storage in water, temporary fillings were removed and cavities were restored with composite resin (Z 100). The restorations were finished, thermally stressed for 500 cycles at 5 ± 36°C, subjected to dye penetration testing and observed under stereomicroscope at x40 magnification.

Results: Results were analyzed using Kruskal–Wallis and Mann–Whitney tests. At both enamel and dentin margins, the microleakage associated with group 3 was significantly more than group 1, 2 and 4. Pre-treatment of cavity with ZOE mixed at a P: L ratio of 10 g: 2 g significantly increased microleakage.

Conclusion: Pre-treatment of cavity with ZOE cement can increase microleakage and is not recommended clinically.

P169
Remineralisation Potential and Micropermeability of Invitro Fissure Sealant Study
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Objectives: The aim of this study is to determine a quantity of remineralisation ions which are released by materials for pit and fissure sealing and its adhesion.

Materials and methods: The clinical study included 39 molars which were treated with three different materials: Breseal (Brecht, Helioseal F (Ivoclar Vivadent) and Fuji 7(Triage) GC. The teeth were thermocycled at 0 and 55°C, after that were stored in 1 l distilled water for 14 days and measuring of fluoride ions was done with ion chromatograph.

The teeth were dived in methyleen blue for 24 h and were cut through mesial, distal and central fissure and the penetration of colour was evaluated using stereomicroscope.

Results: The results shown that Helioseal F and Breseal do not release fluoride ions and Fuji 7(Triage) releases most fluoride ions and has the best adhesion.

Conclusion: Fuji 7(Triage) can serve as a reservoir and contribute to retaining a low fluoride level in mouth preventing thus the appearance of caries.

Key words: fissure sealing, microleakage, adhesion, fluoride ion release

P170
Supplementary Methods of Early Caries Detection
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Aim: Caries is a multifactorial dynamic process which is related to mineral equilibrium that is taken place at plaque.

Material and methods: At recent years multiple researches has been taken in early caries detection and assessment of new methods. Common used technologies are based on visual, optical and radiographic science.

There are detection systems based on electrical current measurement based on lower impedance of caries due to porosities with
regard to sound tooth structure. ECM is the device for measuring this.

**Conclusion:** The radiographic detection tools consist of digital and subtraction radiographies that shows the changes in opacities of radiographies as a guide for mineral change of tooth.

Enhanced visual techniques are DIFOTI using light scattering of hydroxyapatite crystals and fluorescent methods consist of QLF and DIAGNODent that has different outcomes. OCT and imaging with near infrared wavelength is also recently used techniques. USD is a ultrasonic technique used for detection of caries.

**P171**

**Caries Status and Perceived Need for Dental Care in Adolescents**

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**Aim:** To compare the caries status and perceived need for dental care among adolescents in a public and private secondary school.

**Methods:** A descriptive cross-sectional study of 160 adolescents in a public and private secondary school was conducted using self administered questionnaires and oral examination to obtain required details. The schools selection was done randomly. The questionnaires covered background information, socioeconomic status, tooth brushing behaviour, self-rated oral health of the adolescents. Data analysis was done using epi-info.

**Results:** Caries prevalence and mean DMFT were 28.8%, 0.46 and 22.5%, 0.36 in the private and public school respectively, self perceived need was higher in the public school (60.2%) as compared to private school (39.8%) with scaling and polishing ranking first, self rating of oral health was generally good (private school 77.5% and 70% for the public school). Students in the public school had shocking sensation as a symptom in the last 6 months (38.8%) while those in the private school (35%) bleeding gums while brushing. There was an association between the symptoms respondents had in the last 6 months and the self perceived needs for dental care (p value = 0.0015).

**Conclusion:** Normative needs weren’t fully matched by a similar level of self-perceived needs among these adolescents. Perceived need for dental care can be affected by parameters other than the demographics such as the presence of symptoms. Preventive therapy and restorative treatment would be beneficial to these adolescents as certain symptoms were significantly associated with perceived need for dental care.

**Theme: Preventive Dentistry: Epidemiology**

**P172**

**The Oral Health of Children with Mental Retardation in Baku, Azerbaijan**

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**Aim:** The aim of this study was to assess the prevalence of dental caries and periodontal diseases among the schoolchildren with mental retardation in Baku.

**Methods:** Oral health examinations were performed on 236 children with mental retardation (169 boys and 67 girls) from the age groups: 6–8 years, 9–11, 12–16 were held among all of whom studied in four Special Secondary School in Baku city. The WHO 1997 criteria were used for diagnosis and recording of DMFT index and periodontal status, using a visual method with mouth mirrors, dental and periodontal probes, daylight illumination. Dental caries were diagnosed at the caries into dentine at the (D3) threshold. Ethical approval was obtained from the Ethical committee of the Azerbaijan Medical University.

**Results:** Results demonstrated an average caries prevalence of 97.9%. The mean DMFT for all ages was 5.31 of which a very high proportion of decayed teeth (D = 5.02) and a very low proportion of filled teeth (F = 0.02). Prevalence of gingivitis for all ages was 50.4% and increased with age. There were most often children with inflammatory form of gingivitis. Prevalence of periodontitis made 0.85% (early onset periodontitis) and found in last age group only. No gender differences were observed. In general the children exhibited very poor level of hygiene.

**Conclusion:** The study demonstrated a high prevalence of dental caries and gingivitis among children with mental retardation. The need to develop a program aimed at improving the dental health service provided for focusing group of children.

**P173**

**Methods for Increasing Oral Health Indexes of the Patients during Treatments Phase – A Glance at 13 years Experience**

Mehran Hemati  
*Dr. Mehran Hemati*

**Aim:** Since the activity of bacteria has a major and increasing role in the oral tissues health and how patients care the treatments, oral hygiene instruction has a great effect for the health of the treatments.

**Materials and methods:** In this treatment pattern the plan was formed this way that at the beginning in the first visit of the patient we should check the “Mutans Streptococci” and “Lactobacilli” bacteria and check the condition of the saliva of the patient for neutralizing the acids that is made by bacteria. Due to the indexes of “DMFT” and “CPITN” we can get the risk appetite indexes. Then in the middle of treatment sessions we had tried to control the situation and ability to decay development of the bacteria with “Air Flew” techniques for “varnish fluoride”, “varnish goluhexin”, “profelaxin” and utilization of the oral hygiene instructions. After gums control and root treatments, then tooth was filled with composite materials and after that the patient was stood in the control phase which is about 6 months up to 2 years, then we had begun restoration with ceramic abutments.

**Conclusion:** Nowadays using CEREC device (with the combination of CEREC Dentistry and Adhesive Dentistry the accuracy of the treatments increased up to 25 µm) and practically with Dental Adhesives the growth of bacteria environment is limited to personal care. So although bacteria control is still a major issue but the role of personal cares is more important than past.
Oral Health of Preschool Children in an Austrian Community
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Aim: The Austrian community of Sarleinsbach with about 2200 inhabitants became 2002 a healthy community and public health policy related activities are performed to promote general and oral health. Early childhood caries is still a problem in young children therefore an epidemiological study was performed 2010 to analyse oral health status and related social factors in preschool children.

Material and methods: Sixty-two children who attended the kindergarten of Sarleinsbach were involved in this clinical trial including saliva tests. Mothers answered a validated questionnaire concerning social status and oral health behaviour of both parents and children. A trained, calibrated dentist examined children in a dental office. Caries status (d3-4mft) was registered using WHO criteria. SPSS 15.0 software was applied for statistics.

Results: Results are based on the data of 42 children (male: 18, female: 23) with a mean age of 4.5 years. The majority of parents had finished compulsory school. More than 70% of parents reported they brush teeth two times daily. Twenty-eight children brushed their teeth after breakfast and 34 before bedtime. 71% of parents supervised the tooth brushing of children. Main meals and snacks of children were mostly cariogenic. Twenty-three children showed caries free dentition (dmft = 0). The dmft amounted to 1.39. 19% of children showed high counts of Mutans Streptococci, counts of Lactobacilli were low.

Conclusion: It was concluded that oral health among preschool children should be improved by more education of parents in terms of nutrition and tooth brushing behaviour.

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Background: Publications play an important role in the scientific process and provide a key link between the production and use of knowledge. Research in oral health contributes effectively to decisions and strategies aimed at improving the oral health of populations. The objective of this study was to analyse oral health production in order to produce original information on the nature and volume of research in Africa.

Methods: PubMed database was searched for published articles on topics related to oral health research in Africa. Searches were limited by publication date to each year from 2005 to 2010. Nine hundred thirty five (935) publications were retrieved. Articles were classified according to the nationality of first author, the year of publication, the areas of study and the type of research described. Only articles in English and/or in French were selected.

Results: South Africa and Nigeria were responsible for the greatest output (68%) from published articles. Depending on the type of research, cross-sectional studies and case studies are predominant (55.5%); oral surgery and public health represent 62% of production. According to the nationality of first author, South Africa (34.7%), Nigeria (29.0%) and Tanzania (7.3%) have significantly published more in public health.

Conclusion: Contribution of Africa to oral health research production was limited. Strong variations among countries in the production of articles were underlined. So building and strengthening oral health research capacity are important for effective control of disease and the socioeconomic development of country.
Background and aim: The identification of number and morphology of the roots is very important for the success of endodontic treatment. This study aimed to determine the prevalence of three rooted mandibular first molars in patients, who applied to Istanbul University Faculty of Dentistry.

Material and method: Retrospective panoramic radiographs, which were already recorded in the Department of Oral and Maxillofacial Radiology of Istanbul University Faculty of Dentistry, of a total of 720 patients (293 men, 427 women) were examined. The criteria for the indication of an extra root were justified by the crossing of the translucent lines defining the pulp space and the periodontal ligaments in the mandibular first molars. The prevalence of the bilateral and unilateral appearance of three rooted first molars were assessed.

Results: A total of 20 patients were found to have a three rooted mandibular first molar: ten males and ten females. The individuals with three rooted mandibular first molars were 2.77% of the overall patients. All of the three rooted mandibular first molars occurred unilaterally. Of the 20 unilaterally occurring teeth, 17 occurred on the right side, and three occurred on the left side.

Conclusion: Our results indicate that prevalence of three rooted mandibular first molars among our patients was lower than those mentioned in the previous literature. The incidence did not differ between men and women, but there is a big difference between the prevalence of right and left side.

Theme: Preventive Dentistry: Orthodontics

P178
Orthodontic Treatment for All Practitioners. Is it True?
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Purpose: To simplify orthodontic treatment in daily practice and widen the area for tooth movements for all practitioners.

Material and methods: Many orthodontic patients that treatment just need minor tooth movement or growth modifications have been selected. Most patients were selected from many offices after clinical examination and investigation of the diagnostic aids. Many removable and semi-fixed orthodontic appliances as well as growth modification appliances were used for treatment. These appliances can be simply designed and constructed with all dental practitioners.

Results: All patients enrolled under treatment displayed excellent respond for these simple appliances as evidenced by clinical examination and diagnostic aids.

Conclusion: The treatment results for these patients support my believes as at least 40% of orthodontic patient could be treated with most of dentist. This view will enlarge era of orthodontics and dental field as well.

P179
Craniofacial Dysmorphology and Hypodontia in 22q11.2 Deletion Syndrome
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Aim: The purpose of this study was to determine the craniofacial morphology, as assessed on lateral cephalometric radiographs and to investigate the presence and/or the prevalence of hypodontia and distribution of hypodontia in the sample of patients with deletion 22q11 syndrome attending the Eastman Institute, in Stockholm, Sweden.

Material and methods: The sample consisted of 11 patients diagnosed with del22q11 syndrome. These patients were chosen from a larger group of 76, using following criteria: del22q11 syndrome confirmed by FISH analysis as part of a prospective, multidisciplinary study; no orthodontic treatment had been provided prior to the taking of high quality cephalometric radiographs and orthopantograms. The cephalometric tracings were then digitized and measurements made using Dentofacial planner. Consequently taken orthopantograms were used to detect the missing teeth both in control group and patient group with 22q11 deletion syndrome.

Results and conclusion: This study indicates an increased cranial base angle (Ba/SM) in patients with 22q11.2 deletion syndrome. A slight correlation was found between the increased cranial base and increased SN/NL angle indicating a posterior rotation of the maxilla rather than the mandible. When each angle, apart from the cranial angle, was analyzed individually, they appeared to be relatively normal. The open bite features of these patients can be attributed to the hypotonic activity of the oromuscular forces rather than retrognathic features. There were no congenitally missing teeth in neither of the groups in this study.

P180
Study of the Needs in Ortho-Surgical Treatment in Tunisia
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Aim: Actually, man is more and more concerned by his aesthetic; consequently, the ask for orthognathic surgery is increasing to improve the facial profil.

2 Based on an information sheet elaborated at this aim, tested and filled from clinical files.
3 Data codified and seized on computer material.
Results:
1. Five variables showed a highly significant correlation: ANB angle, SNB angle, FMA angle, Labial situation and chin position.
2. The chin position was the most decisive variable in the ortho-surgical treatment.

Discussion: Comparatively with other studies:
1. The sample of our study showed a protrusive position of the maxilla and the mandible and this could explain the indication of bimaxillary surgery for 50.5% of the ortho-surgical cases.
2. Through the two last decades, there is a clear increase in teenagers ask for orthognathic surgery to improve their facial profile.

Conclusion: This study investigated a very important approach in the decision of the ortho-surgical treatment. It opened the way for other studies to recruit a more important sample and be more conclusive in terms of complications. It took in consideration the decision of ortho-surgical treatment without follow-up.

P181
Obstructive Sleep Apnea Syndrome and Maxillary Orthopedics
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Introduction: Obstructive sleep apnea syndrome (OSAS) is characterized by recurrent events that totally or partially obstruct the upper airway during sleep, associated with signs and symptoms. The standard treatment among children is adenotonsillectomy.

Objective: To report the case of a child with moderate OSAS.

Case: The patient was a white-skinned male aged 7 years and 4 months, presenting Angle class II, with complaints of agitated sleep, snoring, respiratory pauses and daytime somnolence and irritability. A polysomnographic examination showed that moderate apnea was present even after adenotonsillectomy. Treatment: The child underwent functional orthopedic treatment on the maxilla, with a modified indirect Planas track. After 9 months of treatment, the retrognathism was seen to have diminished, with increased airway size, as observed using lateral teleradiography.

There was a noticeable decrease in the apnea index, with diminution of the initial symptoms, as seen using polysomnography.

Conclusion: The treatment accomplished was effective for improving the symptoms: it deobstructed the air passage, enabled better ventilation for the patient and controlled the side and secondary effects of OSAS on the orofacial structures.

P182
Cephalometric Study of Dental and Skeletal Variables of Lower Anterior Facial Height
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Aim: Cephalometric norms commonly used for the assessment of the lower third of the face can difficult the diagnosis and treatment of malocclusions when applied to patients with developmental patterns different from what is considered as normal.

Material and methods: For this reason, in order to assess cephalometrically the actual role of maxilla, mandible and upper and lower dentoalveolar components on lower anterior facial height, we used 40 lateral telerradiographs taken from patients presenting Angle Class I and II malocclusions, with ages varying between 18 and 28 years, with no previous orthodontic treatment. All the subjects presented an LAFH measure varying between 45 and 80 mm, and ANB angle between 0° and 8°. Seven linear and two angular measures were obtained and statistically analyzed using Pearson’s correlation coefficient to verify the existence of significant correlations between the several variables (p ≤ 0.05), followed by the application of Student’s t test to evaluate the significance of found correlations.

Results: Results showed a strong correlation between LAFH and anterior alveolar height (ANE-Me × A-Pm); LAFH and dentoalveolar heights (ANE-Me × 1i-Me; ANE-Me × 1s-A); and between upper and lower incisors (1s-A × 1i-Pm).

Conclusion: It can be concluded that maxillar, mandibular and both upper and lower dentoalveolar heights are correlated in LAFH composition. This work was approved by the Ethics Committee of University of São Paulo City, under protocol number 13314707.

P183
Evaluation of the Effects of Class II Activators
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Aim: Distal (Class II) malocclusions are the most commonly seen, and therefore, the most commonly treated type of abnormalities. Dental and skeletal factors are involved in development of distal malocclusions. Both maxillary protrusion and mandibular retrusion are evident in the development of skeletal Class II malocclusions.

Material and methods: The study was conducted on hand-wrist radiographs, together with lateral cephalometric radiographs at the beginning and at the end of treatments of a total of 27 individuals of whom were treated with a Class II activators; lateral cephalometric radiographs obtained from a total of 15 Class II individuals as a control group, which had been performed at a time interval, with which it was possible to evaluate the changes that had occurred in growth and development.

Results: Among the measurements for cranial base dimensions, only the increase in N-Ba in the treatment groups was lower when compared to that in the control group.

Conclusion: The increase in the N-Ba dimension being lower, brings about the idea that the activator treatment may influence maxillary development and consequently the nasomaxillary complex.
Prevalence of the Distal Occlusion in Different Geographical Zones
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Introduction: The distal bite is widespread among orthodontic anomalies. According to Ingerval distal bite makes 12% among orthodontic anomalies, and 49% from the investigation of Kim. Epidemiological researches showed that the distal occlusion meets at 20% of the population of Europe, North America and South Africa, and in Asia, in the Middle East and Latin America this anomaly meets at 10–15% of the population.

According to Ast and others among 1413 school children of Europe aged from 15 till 18 years the normal occlusion meets at 79.9%, and the distal occlusion meets at 23.8%. These data coincide with data of Goldstein and Stanton conducting research among the white American children, and data of Massler and Frankel conducting research among children aged from 14 till 18 years.

In Russia also the distal occlusion meets more often than others. According Pogodina conducting epidemiology research among 4000 Russia school children distal occlusion makes 16.8%, from data of Bobrov- 35.7%, from data of Sherbakov- 30.7%.

In Azerbaijan among 4875 teenagers aged from 12 till 17 years anomalies of occlusion meet at 32%. From them 10% are the share of distal occlusion, 3.2% are the share of mesial occlusion, and 18.8% are the share of others. Clinical and genetic investigations showed that in emergence of distal and mesial occlusion plays a role heredity and related marriages.

Conclusion: Results of the epidemiology researches conducted in different race conditions are similar. It shows that the distal occlusion is often widespread and doesn’t depend on environment factors and race.

Effects of Two Elastomeric Ligatures on Microbial Flora and Periodontal Status in Orthodontic Patients
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Aim: To compare the effects of a nonconventional elastomeric ligature (Slide, Leone Orthodontic Products, Sesto Fiorentino, Firenze, Italy) (SL) and a conventional elastomeric ligature (Ormco, Ormco Corp. Orange, CA) (CEL) on microbial flora and periodontal status in orthodontic patients.

Materials and methods: A total of 13 orthodontic patients (ten female, three male; mean age = 16.2) scheduled for fixed orthodontic treatment were selected for this randomized clinical study. The study protocol was approved by the Research Ethics Committee and written informed consent was obtained from all participants. Brackets on the left first premolars of the patients were ligated with SL, and brackets on the left second premolars were ligated with CEL. The gingival index (GI), plaque index (PI), gingival bleeding index (GBI) and pocket depth values were recorded and microbial samples were collected with a sterilized periodontal curette and analyzed before bonding (T0), 1 week later (T1), and 5 weeks after bonding (T2). For the statistical analysis and calculations SPSS for Win (Ver. 15.0; SPSS, Chicago, IL, USA) was used. The level of significance was set at $p \leq 0.05$.

Results: No significant difference was found between GI, PI, GBI and pocket depth values of SL and CEL groups in T1 and T5 ($p > 0.05$). Similarly, there were no statistically differences between aerobe and anaerobe bacteria counts of the groups in T1 and T5 ($p > 0.05$).

Conclusions: Although the SL covers the total surface of the bracket, it does not cause more plaque accumulation and periodontal problem than CEL.

A Rare Phenomena Finding in Orthodontic Panoramic Radiograph
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Introduction: Panoramic radiograph is one of the most important sources of information in orthodontic treatment. Dentist can visualize the relationship of both dentition, jaw and temporomandibular joint, study of relative developmental status of the teeth and progressive resorption of primary teeth, and ascertain pathologic lesion, but sometimes the dentist found out a rare or unusual material in the picture. This material looked like a small needle which spread out in the soft tissue of the face. In our country this rare or unusual thing called “susuk” which planted by someone with supernatural force. The purpose for doing this is to make them attractive or enhance self confidence.

Case: This case report presented four cases and all the cases was a beautiful female.
Twin B expressed the presence of mouth breathing. Furthermore, Twin A reported of Twin B’s snoring. Medical and dental history, extraoral and intraoral examinations, radiological and otorhinolaryngological findings were used to show the dissimilarities between the twins. An otorhinolaryngological examination revealed a significant difference between twin A and twin B’s nasal septum. Twin B had a deviated nasal septum toward the right. The otorhinolaryngologist stated that this deviation of the septum nasi was sufficient to cause mouth breathing.

**Conclusion:** The lateral cephalometric analysis revealed considerable differences in craniofacial structure and head posture. This case report supports the hypothesis that breathing pattern is one of the cardinal factors concerning craniofacial development.

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**P188**

**Dental Age Assessment by Using Demirjian Methods with OnyxCeph3**

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**Aim:** The assessment of dental age is useful in planning orthodontic treatment, in pediatric dentistry, pediatric endocrinology and forensic medicine. It also adds some important knowledge of growth and development to human biology. Numerous methods exist that allow either the prediction of age or assessment of maturation. Most popular used method was first described by Demirjian, as based on a large number of French-Canadian children. The aim of our study was to investigate the applicability of Demirjian method for estimation of dental age by using Onyx Ceph3™ software.

**Material and methods:** In this retrospective study, dental volumetric tomography (DVT) of 50 Turkish children of known chronologic age and gender were selected; 26 were females and 24 were males and their ages ranged from 7 to 18 years. Dental age assessment was done by Demirjian method with OnyxCeph3™. The development of seven permanent left mandibular teeth is determined from panoramic reconstruction of DVT. The data obtained underwent statistical analysis. The p value of dental age and chronologic ages 0.001 (p < 0.01).

**Results:** No statistically significant difference was observed between the mean dental age of children in relation to gender (p < 0.01).

**Conclusion:** The analyses have shown that mean of dental age is greater than chronologic age. The standards of dental maturation described by Demirjian may not be suitable for Turkish children. The data supports the need for population-specific standards.

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**P189**

**Association between Periodontal Disease and Pregnancy Outcomes among Patients Attending Luth**

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**Aim:** To evaluate the association between periodontal disease and pregnancy outcomes.

**Materials and methods:** Interviewer-administered questionnaires were completed by the subjects who attended the antenatal clinic of the Lagos University Teaching Hospital. Information obtained included; age, gestational age, marital status, educational status, occupation, baby’s weight at birth, expected and actual date of delivery. Clinical assessment of the periodontium was done using Simplified Oral Hygiene Index (OHI-S) and Community Periodontal Index of Treatment Needs (CPITN). Scaling and Polishing and root planing were done for all patients with periodontal disease before and after delivery.

**Results:** Four hundred and fifty women took part in the study with a response rate of 94%. Age ranged between 18 and 34 years with mean age of 29.67(±3.37). About 71% of the participants attained tertiary level of education.

The mean oral hygiene score for the participants was 1.94 (±1.31), maximum score being 2.62 ± 0.28, and the mean OHI-S of the test group was 0.86 ± 0.65. Prevalence of preterm deliveries for the entire participants was 12.5%, with the control group I having a higher prevalence than the others. Prevalence rate of low birth weight recorded in this study was 12.1% and that of spontaneous abortion was 1.42%. Overall the control group I had better pregnancy outcomes.

**Conclusion:** It is important for health care workers to encourage and promote good oral health among pregnant women as this would improve pregnancy outcomes. There is also the need to advocate for pre-conceptional and intra-conceptional periodontal assessment and treatment in this group of women.

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**P190**

**Association of Periodontitis with Overweight and Obesity in Pregnant Women**

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**Aims:** The purpose of the present study is to investigate if overweight and obesity before pregnancy is associated with periodontitis during pregnancy in the pregnant women. Our hypothesis is that the prevalence of periodontitis during pregnancy is greater in overweight and obese people than in people of normal weight.
Materials and methods: 276 subjects in pregnant women at about 24 weeks of gestation were examined. Overweight and obesity was defined as criteria proposed by WHO Expert Consultation. Periodontal conditions were assessed by measuring periodontal clinical attachment loss (CAL). A comparison among underweight, normal weight, and overweight groups for explanatory variables was analyzed using the chi-square test for categorical variables and analysis of variance for continuous variables. Multivariate logistic regression analysis was carried out adjusting for age, health and oral health behaviors, and obstetric information.

Results: Age, delivery history, and periodontitis (two or more interproximal sites with CAL ≥ 4 mm, not on the same tooth) were significantly associated with body mass index (BMI) (p < 0.05). After adjusting for all the covariates, the adjusted odds ratio of periodontitis was 2.94 (1.25–6.89) for overweight (BMI ≥ 23 kg/ m²).

Conclusions: Overweight and obesity before pregnancy is associated with periodontitis during pregnancy in the pregnant women.

P191
Periodontal Surgical Treatment of Patient with Oral-facial-Digital Syndrome – 6 Years Follow up – Case Presentation
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Aim: Oral-facial-digital syndrome is characterized by an X linked dominant mode of inheritance with lethality in males. Clinical features include facial dysmorphism with oral, tooth, and distal abnormalities, polycystic kidney disease, central nervous system malformations and abnormalities of the fingers.

Materials and methods: Patient EJ, age 24, female, had complaints of functional and esthetic nature, inability of chewing, lip incompatibility, gum bleeding, feeling of itchiness in the gums and changes on the position of the teeth. Psychosocial discomfort due to incorrect position of the teeth was associated with speech impediment. After clinical periodontal screening and radiological examination she presented combined suprabony and infrabony pockets, gingival inflammation, tooth mobility and pathologic migration. We observed bi-maxillary protrusion with protrusion of maxillary frontal teeth. Dysmorphic features affecting the head include facial asymmetry, micrognathia, broadened nasal ridge and hemi-facial microsomia. The digital abnormalities affecting the hands and feet include brachydactyly.

Results: After basic periodontal therapy and full mouth scaling and root planning, periodontal surgery was performed. During surgery teeth 12, 11, 21, 22, 26 were extracted. Six weeks after periodontal surgery patient had prosthetic rehabilitation.

Conclusions: Surgical periodontal treatment after 6 years follow-up results with functionality and esthetics, and satisfactory psychological impact to the patient with regards to oral health. As maintenance treatment, patient is advised for the reinforcement of the tooth brushing technique, with regular plaque removal and rigorous oral examination to control and maintain healthy and stable periodontal tissue status.

P192
Case Report: Treatment of Periodontal Bone Defect with PRF and Xenograft Combination
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Introduction: Periodontal regeneration can be defined as the complete restoration of the lost tissues to their original architecture and function by recapitulating the crucial wound healing events associated with their development. Currently, there is a variety of treatment modalities available for periodontal regenerative therapy, which includes bone grafts and substitutes, guided tissue regeneration, the use of growth factors, applications of tissue engineering, or combinations of two or more of the above-listed approaches.

Bovine bone grafting material has been used to fill periodontal intrabony defects, which has resulted in clinically acceptable responses. Platelet-rich fibrin (PRF) is a leukocyte and platelet preparation that concentrates various polypeptide growth factors and therefore has the potential to be used as regenerative treatment for periodontal defects.

Case: A 35 years old female patient has guided to our periodontology department from oral diagnosis department. At clinical examination 11 mm periodontal pocket has measured and there was vertical bone defect, reaches to apical of maxillar lateral incisors apical area. After initial and nons-surgical treatment flap operation performed. Xenograft and PRF combination was fitted into defected area and they were covered with membran material.

Conclusion: After 5 months follow up pocket dept was 2 mm. Defected area has recovered completely bone regeneration and new bone growing area had same density as the adjacent areas.

P193
Carious and Periodontal Status of Patients with Thalassemia Major
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Aim: The oral health of thalassemic patients (periodontal and carious status).

Methods: Seventy thalassemic patients and 60 control subjects between 2 and 20 years old were included in this study. Clinical examination consisted in: Teeth check-up to investigate teeth decays, Lateral cephalometric radiograph and Panoramic X-rays as auxiliary method, facial, profile, and/or intraoral photos, periodontal charting, as well as collecting material from gingival crevicular fluid. Gingival biopsies were obtained in Thalassemic subjects in order to evaluate inflammation. Hematological data were collected also for each patient.

Results: In general, dental examination revealed a poor hygiene. Among 70 examined patients, 80% of them were diagnosed with gingivitis. It was observed a very high rate of caries (99%) and
serious malocclusion stages (deep bite, open bite, Angle’s class II). VariOr failed to demonstrate pathogens in gingival in 80% of thalassemic subjects.

**Conclusions:** Thalassemia is associated with higher rates of caries, periodontal problems and malocclusion. These changes should be taken into account when planning orthodontic treatment and orthognathic surgery.

**P194**

**Comparison of the Effects of Coronally Repositioned Flap Techniques with Releasing Incision and Without Releasing Incision for the Treatment of Localized Gingival Recession: 6 Month Controlled Clinical Study**

Fatma Boke, Murat Akkaya

**Aim:** The aim of the present study was to compare clinical outcomes of split thickness coronally repositioned flap without vertical releasing incisions and full thickness coronally repositioned flap with vertical releasing incisions in the treatment of localized gingival recessions.

**Material and methods:** Nineteen systemically and periodontally healthy patients with bilateral Miller class I recession defects were enrolled in the study. Control recession defects were treated full thickness coronally repositioned flap with vertical releasing incisions and test recession defects were treated split thickness coronally repositioned flap without vertical releasing incisions. Porbing depth (PD), Recession depth (RD), Reccession width (RW), Keratinized tissue width (KTW) and Clinical Attachment level (CAL) were measured at baseline and 3 and 6 months after the treatment.

**Results:** Both groups showed statistically significant gain in Clinical Attachment Level and statistically significant reduction in Recession Depth, Recession Width, Probing Depth. The differences between groups were not statistically significant for Recession Depth; Recession Width; Probing Depth; Keratinized Tissue Width and Clinical Attachment Level after 6 months.

**Conclusion:** This clinical study showed that, new CRF technique is as effective as classical CRF technique for the treatment of localized gingival recession.

**P195**

**Periodontal Disease and Quality of Life**

Sona Samadova, Sevinj Nagieva

**Private Dentist**

**Aim:** The purpose of the research is to compare correlation between level of quality of life and degree of pathological changes in periodontal tissue.

**Material and methods:** Reseach was held among 200 people who had periodontal problems in Baku. Reserched were divided into three groups: group 1—95 persons with catatral gingivitis and mild form of periodontal disease, group 2—68 persons with moderate degree of periodontal disease and 3-rd group 37 persons with severe form of periodontal disease. Index of life quality were researched by Nottingham Health Profile. Authenticity of differences was determined with the method of U-test (Mann-Whitney, MWW).

**Results:** Analysis of results of Nottingham Health Profile survey revealed that in general average point of quality of life indexes for all researched patients was 8.94 ± 0.80. Indexes more than 30 points were 11.5 ± 2.26%. The highest average point was revealed in the group of patients with severe form of periodontal disease 23.2 ± 1.79. That is accordingly 5.3 times (p < 0.001) and 3.1 times (p < 0.001) higher than indexes in the group 1 and group 2. Quality of life indexes higher than 30 points was revealed when patients with severe form of periodontal disease. This index in group 3 was 6.6 times higher (p < 0.001) than in group 2. In group 1 index more than 30 wasn’t revealed.

**Conclusions:** In conclusion we can say that quality of life is directly connected with oral health, and progression of periodontal disease make it worse.

**P196**

**The Dental Anxiety and its Effects on Obesity and Periodontitis**

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**Aim:** The psychosocial factors and their effects on periodontal diseases initiation and progression have been widely investigated. The immuno-suppression, negative coping strategies and irregular dental visits are reported as being a predisposition to periodontitis in anxious individuals. The association between periodontitis and obesity was also investigated. The worsened periodontal condition, decreased teeth number, and irregular dental visits were reported in obese subjects. The aim of this study is to determine the effect of dental anxiety in the association between obesity and periodontitis.

**Materials and methods:** One hundred-and thirteen volunteered subjects (71 female, 42 male) have participated in this study. The clinical periodontal parameters (gingival index, plaque index, bleeding on probing, probing depth and clinical attachment level), and socio-demographic characteristics (education, income, marital status, medical conditions, etc.) were recorded. The Modified Dental Anxiety Scale (MDAS) and Dental Hygiene Fear Survey (DHFS) were also applied.

**Results:** The anxiety scores have not presented any correlations with periodontal parameters (p > 0.05), but have negative significant correlations with obesity parameters (p < 0.05). Obesity and periodontal parameters were found to be significantly correlated (p < 0.05).

**Conclusions:** The results of this study have supported the literature, reported an association between obesity and periodontitis and between anxiety and obesity. Further studies with larger study groups including the subjects with higher anxiety, periodontitis and obesity parameters’ levels might give the opportunity to make more clear comments about these relationships.
P197
Analysis of Daytime Variations in Gingival Crevicular Fluid: A Circadian Periodicity!
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Background: Volumetric alterations in gingival crevicular fluid (GCF) is widely accepted to be associated with periodontal health/disease. The volume/flow of GCF is shown to be affected by an array of methodological factors. However, relatively limited information is available whether GCF is subject to circadian rhythm. Thus, the main aim of the present study is to assess the possible presence/absence of circadian rhythm of GCF. The impact of the sampling technique on daytime volumetric variations was also analyzed.

Methods: In 80 tooth sites and a total of 480 GCF samples, the possible daily volumetric variations of GCF with 2-h intervals (08:00–18:00) were assessed. In order to eliminate any potential volumetric differences due to tooth dimensions, only maxillary incisors were included. To analyze the potential impact of sampling technique on GCF volume and daytime variations, at one site orifice intracrevicular sampling technique (OISM) was used, while the contralateral site was sampled by use of deep intracrevicular sampling technique (DISM). Clinical periodontal parameters of the GCF sampling sites were also recorded.

Results: No significant daily variations in GCF volume could be detected. Higher volumetric measures were observed in inflamed subgroups when compared to healthy subgroups (p < 0.05). OISM was equivalent to DISM with regard to mean GCF volumes and the possible daytime volumetric alterations.

Conclusions: In recent years our general understanding of GCF dramatically increased. However, there still are fields that need better clarification. Factors with the potential to impact the ideal methodology and diagnostic potential of GCF seem to deserve a particular interest.

P198
Poor Oral Hygiene Related Peripheral Giant Cell Granuloma
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Introduction: Peripheral Giant Cell Granuloma is a reactive lesion derived from periodontal ligament and periosteum because of irritating factors such as trauma, tooth extraction, plaque, calculus, badly finished fillings, unstable dental prosthesis, chronic infections and impacted food. It is more common in women more than men. It can show recurrence after excision. PGCG in a man patient is discussed at literacy.

Case: A 41-year-old man patient was referred to the Department of Periodontology with the complain of the swelling of gum at the anterior mandibula. The patient told that he had had this sessile bluish red smooth lesion since 1.5 year with no pain. The teeth near to the lesion were vital, but had bleeding on probing. Radiographically around the central incisors and left lateral incisor there had been bone resorption.

After the conservative periodontal treatment, the lesion had been excised. At the surgery, central incisors and left lateral incisor had been removed. The lesion sent to the Department of Pathology. It had been reported as a Peripheral Giant Cell Granuloma. In this case, the patient was healthy, non-smoker, but had poor oral hygiene. The lesion is likely to be occurred because of poor oral hygiene in patient man.

Conclusion: It is very crucial to diagnose those lesions at their initial stage. Patients should be informed about the importance of the lesions even they do not cause any pain, they can lead to tooth or bone loss. In dental practice, for providing people qualified oral health, cases should be taken care of. Furthermore, early diagnose and treatment should be done.

Theme: Preventive Dentistry: Public Health

P199
Dissemination of New Japanese Cosmetic Acupuncture Techniques on New York
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Purpose: Today Acupuncture is often used in the treatment of common symptoms caused by stress such as painful neck and shoulders, tension headaches, digestive problems, dry eyes, insomnia, etc. Acupuncture works by stimulating your body’s own natural healing power and unifying the vital energies “Qi”.

Materials and methods: Cosmetic Acupuncture (CA) helps rejuvinate the skin and improves tone by stimulating healing and enhancing the skin’s overall health. CA takes a very different approach to treatment compared with general acupuncture. To begin with, more needles are used in concentrated patterns particularly on the face.

Results: Natural beauty follows on from good health. Healthy body and spirit are the foundations for a youthful and beautiful appearance. For this reason, CA also promotes general health and treats any underlying medical conditions. CA is therefore a truly holistic approach to beauty, working on the body’s general health and wellbeing as well as providing highly effective cosmetic treatments.

Conclusion: I gave a lecture about CA at New York College of Traditional Chinese Medicine, October 2012. The lecture was favorably received by most students and teachers. I would like to spread CA all over the world.
P200
Recognition of Chewy Foods among Guardians of 3-Year-Old Children
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Purpose: We investigated some of the effects of food education, with a focus on foods cited as examples of chewy foods eaten by 3-year-olds during meals by their parents and guardians.

Materials and methods: Subjects were approximately 6000 children among those who underwent the official health checkup for 3-year-olds offered in Kanagawa Prefecture between July and October 2011. The final numbers of subjects were 4483. The survey was performed via a questionnaire that asked about attributes, actions to ensure dental health, and history of cavities. In this report, we calculated the total number of cases of each type of chewy food cited as an example by parents and guardians who answered “Yes” to the question in the survey “Do you include chewy foods in your child’s meals?” Foods cited as being chewy were divided into ten categories. This ranks foods on a scale of 1–10, with higher scores indicating greater chewiness.

Results: A total of 2497 respondents cited actual examples of chewy foods. Because some of these gave multiple examples, 4654 valid responses were received in total. The level of chewiness is not necessarily consistent with the number of times a food is chewed.

Conclusions: The distribution of foods of different rankings did not exhibit a consistent trend, and no significant differences were evident in the goodness of fit of foods of different chewiness rankings.

P201
Follow-up Investigation after Implementation of Group Fluoride Mouthrinse Program
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Purpose: We conducted an investigation to clarify any changes in oral health status and habits from fluoride mouthrinsing at preschools, kindergartens, elementary and junior high schools that implement the group fluoride mouthrinse program in a city-run program.

Materials and methods: We administered questionnaire surveys to 5283 children in City A, which carries out group fluoride mouthrinsing. We requested the City A Board of Education to administer the surveys, then requested the schools to distribute and collect them. The final numbers of subjects were 3698. Tests of goodness of fit were performed on selected conflicting responses, with a level of significance of 5%. This investigation was approved by the Ethics Committee at Kanagawa Dental College (no. 174).

Results: Only 18.9% responded that they observed changes in their child from the fluoride mouthrinse program. While 64.4% selected “Tooth brushing habits improved,” 2.3% selected that “Tooth brushing habits became worse.” In addition, 11.1% selected “Teeth look shinier,” but 3.4% selected “Teeth look cloudier.” A total of 7.3% selected “Gets canker sores less often,” and 2.4% selected “Gets canker sores more often.”

Conclusions: These results did not indicate neglecting of tooth brushing habits, the presence of dental fluorosis, or the presence of canker sores or other side effects on the mucous membrane.

This study was supported by Health Labour Sciences Research Grant (H24120701).

P202
Necessity of Pre-Testing and Re-Testing for Successful Questionnaire Surveys
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Purpose: We conducted a questionnaire survey of 3-year-olds and their parents/guardians to prepare guidelines that improve their understanding of ingredients for chewy foods.

Materials and methods: We conducted a pretest by questionnaire on eight male and female with experience raising children, and conducted a retest 3 weeks later. The contents of this questionnaire included personal attributes (gender, birth order, etc.), dietary habits, and dietary knowledge, etc.

This study is compliance with the Helsinki Declaration, and was approved by the Ethics Committee of Kanagawa Dental College (June 11, 2012, no. 189).

Results: Based on the opinions of respondents during the pretesting and retesting, we revised the wording and word arrangement, and underlined some parts to add emphasis. Despite the fact that questionnaires are frequently used in surveys, few of them examine question reproducibility or consider whether the intent of the questions is correctly conveyed to the respondents. The results of the current study revealed that answers to questions about personal attributes or current habits were highly reproducible, while those that required judgment based on past memories or vague knowledge were not very reproducible.

Conclusions: When carrying out questionnaire surveys, both pretesting and re-testing should be performed in order to ensure the stability of responses before the main survey is implemented.

This study was sponsored by Kanagawa Public Health Association Research Grant(2012).
Emergency Care by Teachers of Dental Injury in Preschoolers

P203

Aim: To determine the knowledge of private and public elementary teachers in the emergency management of dental injury in preschool children.

Method: The study was a cross-sectional descriptive study. A total of 100 self-administered questionnaires were administered to 50 teachers in eleven (11) private and 50 teachers in twenty-one (21) public randomly selected elementary schools. The questionnaire consisted of demographic data and sections to determine the knowledge of teachers concerning traumatic dental injury.

Results: In comparison between public teachers and private teachers on the knowledge of dental trauma and its emergency management, the association showed that there is no statistically significant association in the knowledge of the prevention of dental trauma (p = 0.3675), the knowledge of the emergency treatment of dental trauma (p = 0.3574), and overall knowledge of dental trauma (p = 0.8199).

Conclusion: The knowledge of preschool teachers in private and public elementary schools is poor. Therefore, it is imperative that dentists improve school health programme by helping to establish oral health promotion in schools and also include the training of teachers on oral health.

Emergency Comprehension of Patients Who Attended to Dentists

P204

Objective: Dental emergency is a contradictory situation. Both dentists and the patients have different opinions about the subject. As dental trauma or injuries are the main subjects of dental emergency, acute pain or abscess may be included in this. But, emergency is an unexpected situation while most of the dental problems give signs more or less before acute pain occurs. Most of the patients call their problems emergency because they had irresistible pains or aches but after the examination and the anamnesis another problem rises up, oral health neglect.

Material and methods: 234 (126 male and 108 female) patients data who attended to the emergency clinic during off-duty hours, from 00:00 to 08:00 hours and on weekends were recorded. With the data obtained sex-problem-duration tables were prepared. Data obtained from questionnaires were assessed statistically by SPSS for Windows version 15.

Results: 6.81% of the patients attended to the emergency dental clinic and average complaint duration was 31 days. The most common complaint was toothache which was followed by periodontal problems.

Conclusion: Dental emergency is misunderstood and emergency clinic is understood as a clinic where patient can get a treatment in whenever he wants, at any hour, without waiting and without taking a rendezvous.

Prevalence of Tooth Wear Lesions among Patients

P205

Aim: To determine the prevalence of toothwear lesions in a population of patients attending a selected Dental clinic.

Methods and materials: The population consisted of consecutive patients attending the Dental Clinic of the Lagos University Teaching Hospital, Lagos, Nigeria. Self-administered questionnaires were designed to determine the knowledge and the prevalence of toothwear lesions among these patients with an intra-oral examination done for every patient. The Smith and Knight toothwear index was used in recording toothwear scores. Pre-tests were used to test the clarity of the questionnaires. Data collected was analysed using the Epi-info 3.5.1 statistical software.

Results: A total of 100 patients participated in the study, more than half of the respondents (54%) had not heard of toothwear lesions previously and 37% of the respondents were knowledgeable as to the cause of such lesions. The lesion with the highest prevalence was Attrition (45%), perhaps attributed to the high consumption of hard foods followed by the combination type (23.9%) with erosion (15.6%), abrasion (14.7%) and Abfraction (0.8%) coming in further down. The occurrence of both tooth sensitivity, associated mainly with erosion and abrasion; and pain, closely related with attrition; were the most common problems associated with the toothwear lesions.

Conclusion: From the result of this study, prevalence of toothwear lesions can be said to be on the increase when compared with previous publications, there is an increased clinical evidence to show that early detection as well as public awareness campaigns are the key to reducing the occurrence.

Impact of Dental Healthcare Waste on Our Environment-Solutions

P206

Introduction: Global concerns, such as ozone layer depletion caused by green-house gases, melting of ice caps due to global warming etc. are already a matter of great concern today. The large volumes of health care waste if not managed properly can lead to a similar global hazard. Every system in nature progresses towards disintegration and it contributes to creating waste. A modern hospital is a complex multidisciplinary system which consumes thousands of items for delivery of medical care and is part
of physical environment. Infectious waste being generated at Dental Offices&laboratories has gained massive importance of late, legislations® utulatory bodies viewing it as a serious threat to Healthcare workers. Mercury is a potent neurotoxin, at very low level of exposure it can cause permanent damage to the human central nervous system. Certified amalgam separators installation to offices regardless of sewer disposal type (public system), as Mercury is an important component in amalgams. Properly manage and dispose of all other dangerous waste streams generated by the dental office (e.g., X-ray wastes, or lead foils/aprons). Dispose of all scrap amalgam waste from traps, filters and separators with a licensed treatment, storage, disposal or recycling facility. Lead, Cadmium, Chromium and even disinfectants like Glutaraldehyde, Bleach though are surface disinfectants but are toxic chemicals. Proper training on how to dispose off mercury will contribute to the prevention of environmental exposure. Staff training is a key element in the proper prevention and management of mercury spills.

Methods and conclusion: This poster depicts how dental waste management precautions in Dental Offices – help in reducing the impact on environment. Thank You.

P207 Sources of Health Information and Access to Publicly Funded Dental Care among Toronto Youth
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Objectives: The aim of this environmental scan is to develop better understanding of behavior of Toronto adolescents towards access to health information within their existing community.

Methods: The participation was on a voluntary basis with participation of 198 adolescents between the ages of 12 and 18. Data were collected from nine different sites of the city of Toronto with a self-administered feedback form, consisting of 13 multiple choice questions. The questions focused on the self-perception of the youth regarding their general and dental health and sources of health information they prefer and utilize.

Results: Overall, the participants classified their general health status better than their oral health status; 65.2% reported that their last visit to the dentist was during the previous year and 15.7% had not visited the dentist during the two previous years; and over 24% reported “tooth pain” as their main reason to visit a dentist. 36.9% of the sample indicated “cost of dental treatment” as a barrier to access dental care. As for the dental information, the most preferred sources were dental clinics (70.2%) and family doctor (31.3%).

Regarding the health advertisements, “Internet” and “Poster in schools” represented 42.4% of their preference, followed by “Pamphlets in health clinics” (34.3%) and “Poster in the TTC” (33.8%).

Conclusion: This study describes the information obtained from a small subset of the Toronto youth population. However, the findings of this scan present some discussion about the opportunities for improving ongoing processes of health communication and advertisement among youth in Toronto.

P208 The Association of Hormone Replacement Therapy and Periodontal Disease in Postmenopausal Women
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Introduction: The physiological ovarian hormonal changes associated with natural or surgical menopause, cause some postmenopausal women (PMW) to experience climacteric gynecological symptoms, osteoporosis and increased risk of periodontal disease particularly in gingival and periodontium. The present study examined the effects of the hormone replacement therapy (HRT) in oral dental health of the women in particular in gingival, periodontium, pain and tooth mobility.

Materials and method: Total population of the study comprised 68 menopausal women and was divided in two groups (38 women Group A and 30 women Group B). Women were in good general health, within 2 years of menopause and free from any systemic disorder. Group A received a combined preparation containing 1 mg 17b estradiol and 2 mg drospirenone in a medication of estrogen valerate and drospirenone in a continuous regimen for daily intake, while the group B did not received any therapy.

All participants were subjected to measurement of panoramic mandibular index (PMI) and assessed serum calcium and to dental examination in 3 months intervals for 2 years.

Results: The mean age of our participants was 48.5 years. Our results confirmed that this HRT regimen led to reduced dental pain and tooth mobility and acted as protective factor to gingival and periodontium disease. No significant differences were founded in gingival recession and calcium levels in both groups.

Conclusion: The effect of the HRT to oral health is probably depending on the existence of estrogen receptors in gingival and periodontal area and not on the calcium metabolism.

P209 Oral-Dental Health Evaluation of Children between Ages 6–14 in Serdivan-Sakarya
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Aim: The aims are, to conduct oral examinations on primary, secondary school students, inform them about milk, permanent teeth decays, recommend treatment, raise conscious generations emphasizing brushing habit.

Persons and method: The study was conducted after receiving authorization, within school year of 2012–2013 with 9139 students who agreed to participate, study at 43 schools in Serdivan Province. Dentist examination results were evaluated using descriptive statistics in SPSS software. Teeth examinations, surveys were performed on 100 students before, 2 months after training to determine efficiency.
Results: 21,558 decayed, 166 filled milk teeth, df-t index (3.61) were investigated for 5431 kindergarten, primary school students. 73.6%, 18.3% of primary school students have milk, permanent teeth decays respectively. 99.2%, 96.8% of students don’t have fillings in milk, permanent teeth respectively.

6076 decayed, 1419 filled, 239 absent permanent teeth, DMF-T index (2.08) were investigated for 3708 secondary school students. 27.4%, 60.2% of students have milk, permanent teeth decays respectively. 99.2%, 81% of students don’t have fillings in milk, permanent teeth respectively.

Considering results of surveys, favorable results were obtained regarding understanding the importance of 6-year-old teeth, improvement of oral hygiene.

Conclusion: Index values were below Turkey average, thus dental health of students is concluded not to be in an unfavorable situation. Decayed teeth were concluded to be untreated. Therefore; persistence of city-wide examinations, trainings will be beneficial for taking measures.
FC100
Antimicrobial Efficacy of Salvadora persica Extracts on Orthodontic Brackets
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Aim: The aim of the study was to investigate in vitro, the antimicrobial potential of hexane and ethanol extracts of Salvadora persica on a monospecies-biofilm model established on orthodontic brackets.

Materials and methods: Streptococcus mutans biofilm was formed on 48 orthodontic brackets following 3 days incubation at 37°C in anaerobic condition. The bacterial cell viability of this biofilm was measured after their exposure to saline, hexane extract of Salvadora persica, ethanol extract of Salvadora persica and 0.2% chlorhexidine using 3-(4, 5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulphophenyl)-2H-tetrazolium (MTS) assay. Half of the brackets were quantified by enumeration of the colony forming units (CFU). The absorbance values obtained from the MTS reduction assay were analyzed statistically using one-way analysis of variance comparing the test groups with the controls. Values of p < 0.05 were considered statistically significant.

Results: The absorbance values obtained from the MTS assay showed that the cell viability of Streptococcus mutans biofilm when exposed to 5 mg/ml of hexane extract <5 mg/ml ethanol extract <saline. The cell viability did not differ significantly when exposed to hexane extract and chlorhexidine separately (p > 0.05). The CFU counts of Streptococcus mutans obtained from chlorhexidine exposure were lower when compared to those obtained from hexane and ethanol extract exposure.

Conclusions: Hexane extract of Salvadora persica was found to have a high antimicrobial efficacy while the ethanol extract showed a moderate efficacy on Streptococcus mutans biofilm established on orthodontic brackets suggestive of its potential use as an oral antimicrobial agent for orthodontic patients.

FC101
Assessment of Fluctuating Asymmetry in Various Malocclusions
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Aim: Assessment of fluctuating asymmetry has clinical importance in the diagnosis and treatment planning of orthodontic patients. Analyzing presence of fluctuating asymmetry in various malocclusion, helps in recognition of asymmetry, for its input in treatment planning.

Objective: To assess fluctuating asymmetry in Angle Class I and Class II malocclusions. To assess pattern of fluctuating asymmetry in males and females in Angle Class I and Class II malocclusions.

Materials and methods: Its a cross sectional study conducted in dental clinic, AKUH during the period July 2010–July 2011 on 100 subjects using non probability purposive sampling technique. Digital vernier caliper is used as tool to measure mesiodistal and buccolingual dimensions of central incisors, canines and first molars in maxillary and mandibular arch.

Results: Fluctuating asymmetry was observed in both Class I and Class II malocclusions. Pattern of fluctuating asymmetry was different in males and females in Class II malocclusion.

Conclusion: Pattern of asymmetry is same in both Class I and Class II malocclusion, although gender dimorphism is seen in Class II malocclusion.

Thursday, August 29, 2013
FREE COMMUNICATIONS SESSIONS 17–32
Patient factors include: patient motivation, patient expectation, patient readiness, economics, priorities of the patient. Orthodontist factors include: diagnostic acumen, effective motivation of the patient, economic considerations, devotion, time and energy, cooperation with the other team.

The indications of camouflage treatment are: short average facial pattern, mild antero–posterior problem, crowding <4–6 mm, normal soft tissue features, no transverse skeletal problem. Contra-indications of camouflage treatment are long vertical facial pattern, moderate to severe a-p discrepancy, crowding more than 4–6 mm, exaggerated facial features, transverse skeletal problem. Several cases of Skeletal class-III will be presented with RME as an adjunct in some impacted teeth, extraction and non-extraction.

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**FC103**

**Comparison of Shear Bond Strength Between Waterlase Laser and Sandblasting Recycling Methods on Stainless Steel Orthodontic Brackets**

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Orthodontic bracket bond failure is common during orthodontic treatment. The main benefit of using debonded brackets after recycling is cost saving.

**Aims:** (1) to assess different methods of recycling orthodontic brackets, (2) to evaluate Shear Bond Strength (SBS) of (a) new, (b) recycled and (c) repeated recycled stainless steel brackets (i) with and (ii) without primer.

**Methods:** A total of 200 extracted human premolar teeth and 200 premolar stainless steel brackets were used. The sample was divided into ten groups; four groups were recycled using laser and sandblasting respectively, while the last two groups were control. Repeated recycling was done in each recycling method with application of primer on the orthodontic bracket base; to evaluate the effect of repeated recycled brackets and adding bracket base primer on SBS. 3M Unitek orthodontic composite was applied on all bracket bases. Brackets were subjected to shear force until brackets debond and SBS was measured.

**Results:** ANOVA and Levene’s Test were done. There was no significant difference found between the mean SBS of the new bracket and recycled bracket using laser or sandblasting. Brackets with primer showed slightly higher SBS but not of significant with brackets without bonding agent. Repeated recycled brackets showed slightly lower SBS but not significantly different compared to those of new and recycled brackets.

**Conclusion:** Recycling orthodontic brackets using Waterlase laser or sandblasting can be used as an alternative to new brackets. It is recommended to apply a bonding agent on the bracket base to provide greater bond strength.

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**FC104**

**The Effect of Water Flow Rate Used for Laser Surface Treatment on Shear Bond Strength of Orthodontic Brackets**

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**Aim:** The aim of this study was to investigate the effect of different water flow rate used for laser surface treatment on shear bond strength of orthodontic brackets.

**Materials and methods:** Sixty-six sound premolars were selected for the study and divided into four groups: G1 (n:15), control group, enamel etched with 37% phosphoric acid; G2 (n:17), enamel etched with Er:YAG laser (120 mJ, 10 Hz, 1.2 W) 25 ml/min with water flow rate; G3 (n:18), enamel etched with Er:YAG laser (120 mJ, 10 Hz, 1.2 W) 36 ml/min with water flow rate; G4 (n:16), enamel etched with Er:YAG laser (120 mJ, 10 Hz, 1.2 W) 48 ml/min with water flow rate. After the bracket bonding procedure, all bonded teeth were thermal cycled in deionized water at 5 ± 2–55 ± 2°C for 500 cycles. Shear bond strength (SBS) test was applied and all specimens were inspected under the digital stereomicroscope and SEM. The Kruskal–Wallis statistical test was used to determine significant differences in SBS between the four groups.

**Results:** Mean SBS results and standard deviations of the group 1, 2, 3 and 4 were 13,777 ± 6581, 12,1468 ± 5439, 13,289 ± 2242 and 13,945 ± 4183 MPa respectively. According to Kruskal–Wallis test no significant differences were found among the groups (p ≥ 0.05). Er:YAG laser treatment can be an alternative method to conventional acid etching. Also water flow rate does not effect the SBS values in this surface modification method.

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**FC105**

**Dental Plaque Associated with Self-Ligating Brackets During Orthodontic Treatment**

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**Objective:** To compare changes in the amount and distribution of dental plaque associated with placement of elastomeric modules over a self-ligating bracket during orthodontic treatment and to relate these changes to the periodontal inflammation.

**Materials and methods:** A cross-arch randomisation trial was carried out at Bristol Dental School, UK. Clinical measurements of periodontal inflammation and plaque accumulation and microbiological test were made on 24 patients wearing fixed appliances (Damon 2 brackets) at the start and 3 months into fixed orthodontic treatment.

**Results:** In the first 3 months of treatment there was no statistically significant difference for bleeding on probing between incisors with and without elastomeric modules (p = 0.125 and 0.508 respectively).
The difference in plaque accumulation in was not statistically significant (p = 0.78). Furthermore, the difference in probing depths between the incisors was not statistically significant (p = 0.84). The microbiological analysis using Denaturing Gradient Gel Electrophoresis (DGGE) technique showed no significant difference.

**Conclusion:** Elastomeric modules were not significantly associated with any increased risk during the initial 3 months of treatment when compared to self-ligating brackets. Long-term changes would be of great interest.

**FC106**

**The Effects of Extremely Low Frequency Electromagnetic Fields on Orthodontic Tooth Movement**

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**Purpose:** The purpose of this study was to evaluate whether a 50 Hz extremely low frequency electromagnetic fields (ELF-EMF) affects the amount of orthodontic tooth movement in rats.

**Materials and methods:** The experiments were performed on 18 male Sprague–Dawley rats. The rats were randomly divided into three groups (n = 6): cage-control (Cg-Cnt) group (n = 6), SEMF group (n = 6), PEMF group (n = 6). In SEMF and PEMF groups, rats were subjected to 1.5 mT EMF exposure 8 h a day for 8 days. In order to obtain tooth movements, holes which far away 1.5–2 mm from gingiva were drilled on rats right and left maxillary central incisors and 20 gr orthodontic forces was applied to teeth. Generated Linear Model for Repeated Measures and Bonferroni tests were used to evaluate the differences between groups. Interactions among groups by days were found by using Pillari’s Trace Multivariate test. Statistical analyses were carried out by using the statistical packages for SPSS 15.0 for Windows.

**Results:** According to the results, significant differences were found among groups (F = 5.035; p = 0.03) according to the amount of tooth movement. Significant differences between the amount of tooth movements were found especially after fifth day followed by sixth, seventh and eighth (p < 0.001).

**Conclusion:** Within the limitations, according to the results 0.12% CH was used for reducing the number of MS on thermoplastic appliance surface.

**FC108**

**Do Intracoronal Bleaching Methods Effect on Shear-Bond-Strengths of Orthodontic Brackets?**

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**Objective:** The aim of this study was to evaluate the effects of different intracoronal bleaching methods on the shear bond strength (SBS) and bond failure site of brackets bonded to enamel.

**Materials and methods:** One hundred and five freshly extracted mandibular incisors were randomly divided into seven groups (n = 15). After finishing root canal preparation and filling, the root fillings were removed 2 mm apical to the cementoenamel junction, and a 2-mm-thick layer of glass-ionomer base was applied. Group I (Total-Etch) and II (Self-Etch) decide on as the control. Intracoronal bleaching was carry out with 35% Hydrogen-Peroxide in Group III, 37% Carbamide-Peroxide in Group IV, 16% Carbamide-Peroxide in Group V, 30% Hydrogen-Peroxide + Sodium-Perborate in Group VI and distilled-water + Sodium-Perborate in Group VII. All groups were bonded with self-etching primer system except Group I. The samples were stored in water for 24 h at 37°C and thermocycled. The SBS of the brackets were measured in megapascals (MPa).

**Results:** The mean SBS values of Group I (14.24 ± 2.74 MPa) was significantly higher than other groups (p < 0.05). Then Group II (9.58 ± 2.15 MPa) was higher values than other groups. The lowest mean SBS values were measured in Groups III, VI, and VII (5.12 ± 1.23, 4.22 ± 1.33, and 4.46 ± 1.25 MPa with
respectively). The results of the chi-square test showed that there were significant differences between seven groups in fracture analyses.

**Conclusions:** The SBS of orthodontic brackets are reduced by intracoronal bleaching bonded with self-etching primer system on human enamel. Bleaching with 35% HP, HP + SP, and Distilled Water + SP affects SBS more adversely than other agents.

**FC110**

Relationship Between Cervical Column Morphology and Skeletal Deep Bite

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**Aim:** Cervical column morphology is related to head posture which is associated with craniofacial morphology and mandibular rotation pattern. Studies have shown connection between cervical column fusions and facial morphology. Since skeletal deep bite leads to many aesthetic and functional problems including respiratory and swallowing difficulties, and TMJ and facial pains, early diagnosis and treatment is critical to prevent abovementioned problems. This study aimed to compare the cervical column morphology in adults with skeletal deep bite and the control group with normal occlusion and craniofacial morphology.

**Methods:** In this case–control study, 25 deep bite patients (17 females and eight males, 17–30 years old) were compared with 25 controls (16 females and nine males, 17–30 years old). Angular measurements of craniofacial and cervical column dimensions were performed on lateral cephalograms. Anomalies of cervical column including fusion and arch deficiency were assessed. Jarabak index, ANB, SN-MP, and MM angles were also assessed. Data were analyzed by Chi Square and Fisher’s Exact Tests using SPSS software.

**Results:** In the deep bite group, 72% had cervical fusion which was significantly more than the control group in which 32% had fusion (p < 0.001). Fusions in control group were between C2 and C3. However, fusions in deep bite individuals were observed in C2–C3, C3–C4, and C4–C5 sites.

**Conclusions:** Skeletal deep bite and cervical column deviations are evidently associated, and most significant deviation in cervical vertebrae was observed in C2–C3 intervertebral space. This observation is useful in prevention and early treatment of related problems.

Free Communication Session 18 | B342 | 29.08.2013 | 09:00–11:00

**Theme:** Dental Treatment and Restorative Dentistry: Materials

**FC111**

Effect of Curing Mode on Microhardness of Resin-Modified vs. Conventional Glassionomer

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**Aim:** To evaluate the micro-hardness of various thicknesses of resin modified glassionomer (RMGI) restoration cured with either LED or halogen curing unit, compared to conventional glassionomer (CGI) restoration, tested after one and 7 days.

**Materials and methods:** Two hundred and seventy cylindrical specimens with different thicknesses were prepared from the two selected materials. Half of the RMGI specimens (n = 90) were photopolymerized from the top surface by LED and the other half by halogen curing unit. Specimens were tested after one and 7 days. Mean Vicker microhardness values for the bottom and top surfaces of each thickness were calculated.

**Results:** CGI showed a significantly higher mean micro-hardness top and bottom values compared to RMGI after 24 h and 7 days. There was no statistically significant difference in mean micro-hardness values between top and bottom surfaces for CGI at the different tested thicknesses. For the top surface, the micro hardness values of RMGI cured with LED was significantly higher than that cured with halogen, while there was no statistically significant difference at the bottom surface using different curing systems. Mean micro-hardness of the bottom surfaces of 2 mm thickness was significantly higher than 3 mm and 4 mm thicknesses. Seven days storage revealed significant higher mean micro-hardness values compared to 24 h.
Conclusion: Inclusion of resins in the RMGI does not improve the surface micro-hardness of these materials. The polymerization and acid/base reactions produced in RMGI did not insure adequate polymerization especially in thicker layers. Curing efficiency of LED was comparable to halogen light.

Effect of Different Exposure Times on the Amount of Residual Monomer Released from Adhesive Systems
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Aim: The aim of this study was to investigate the effect of different exposure times on the amount of residual monomer released from adhesive systems by high performance liquid chromatography (HPLC).

Materials and methods: Six different adhesive systems were used in this study. The adhesives were applied on bovine dentin surface (length of an edge 7 and 0.9 mm thickness) according to the manufacturer instructions and polymerized using LED for 10, 20, 40 and 60 s, respectively (n = 5). After polymerization specimens were stored in 75% ethanol solution. Residual monomers (Bis-GMA, TEGDMA, UDMA) which eluted from adhesives (after 10 min, 1, 24 h, 7 and 30 days) were analyzed with HPLC. The results were analyzed with one-way analysis of variance and Turkey HSD tests.

Results: It was found that there was residual monomer release at all time periods. There were statistically significant differences among adhesive systems according to the cumulative released Bis-GMA, UDMA and TEGDMA (p < 0.05). It was observed that increasing polymerization time did not have an effect on residual monomer release except All Bond 3 (TEGDMA) group (p > 0.05).

Conclusion: All Bond 3 showed the highest amount of Bis-GMA, UDMA and TEGDMA. Exposure time, recommended by manufacturers is sufficient for polymerization except release of TEGDMA from All Bond 3.

Effects of Boron on the Physical Properties of PMMA
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Objectives: The objective of this study was to determine whether the addition of different types of boron (Colemanite, Borax, Boric Acid) to polymethylmethacrylate denture base resin (PMMA) would improve the physical properties (transvers and impact strengths, surface roughness, and hardness) of PMMA.

Materials and methods: Different types of boron were added to heat-cured PMMA in different ratios (1%, 2%, and 3%). Four hundred PMMA specimens were prepared for transverse strength (65 × 10 × 2.5 mm), impact strength (50 × 6 × 4 mm), and hardness (20 × 6 × 4 mm) tests according to the manufacturers’ instructions (n = 10). The surface roughness values were measured with a surface roughness profilometer. To determine transverse strength of the specimens, they were loaded until failure on a universal testing machine using a three point flexural test. Specimens were then subjected to the Charpy impact test machine. Hardness of the specimens was measured with an analog Shoremetre Shore D. The data were analyzed with Kruskal–Wallis and Mann–Whitney U tests (α = 0.05).

Results: The lowest mean roughness value was observed in 1% and 3% Colemanite specimens. Moreover, the highest mean transverse strength value was seen in 3% Boraks specimens and followed by 1% Colemanite specimens. In addition, the highest mean impact strength value was recorded in 1% Colemanite specimens, and differences between 1% Colemanite group and control group were found to be statistically significant (p < 0.05). Furthermore, there was significant difference in hardness between control group and all other groups (p < 0.001).
Conclusion: The addition of 1% Colemanite to PMMA improved the physical properties of PMMA.

FC115
Effects of Calcium-Silicate Based Materials on the Dentine
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Aim: The study was designed to compare the composition and chemical reaction between analyzed bioactive calcium-silicate based materials and dentin during cavity lining.

Materials and methods: The standardized class II cavities were prepared in human extracted posterior teeth (collected in a written agreement with every patient) and, accordingly filled with Biodentine and MTA+. Next dentinal discs were prepared and the 1 mm specimens were sectioned longitudinally with diamond cutter Micracut 175. The samples were processed by SEM, EDS and Raman Spectroscopy to observe the structure and chemical composition of both of them in a contact with dentine.

Results: Significant differences in composition of organic phase and microelements between both materials were found. There were also visible differences in the structure of the new layer on the border with dentine (Transition Zone). Additionally, Biodentine showed higher bioactivity there than MTA+.

Conclusions: Biodentine and MTA+ are bioactive materials. Bio-mineralization reaction took place between dentine and materials. Methods used in the research are suitable to investigate reaction initiated by Biodentine or MTA+.

FC116
Effects of Different Accelerators on Setting Properties of Mineral Trioxide Aggregate
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Aim: The aim of this study was to examine the effect of different accelerators on setting time and crystalline formations of white Mineral Trioxide Aggregate (WMTA).

Materials and methods: WMTA mixed with 15% Na₂HPO₄, 15% Na₂CO₃, 10% CaCl₂, 23.1 wt% Calcium Lactate Glukonat (CLG). ProRoot white MTA (Dentsply Tulsa Dental, Tulsa, OK) was used as a control group. The setting times were evaluated using a vicatronic (Matest, Italy). To prepare samples for setting time experiments, stainless steel ring molds were used. These ring molds have an inner diameter of 10 mm and a thickness of 4 mm. The setting time for using liquid phase of deionized water, with 15% Na₂HPO₄, 15% Na₂CO₃, 10% CaCl₂, 23.1 wt% CLG was recorded when the needle failed to create an indentation in three separate areas. Set materials were characterized by scanning electron microscopy (SEM), X-ray diffraction analysis (XRD). The final setting times were determined by the arithmetic mean of ten repetitions of the test for each experimental group. The data were analyzed by ANOVA and the Tukey test (p < 0.05).

Results: There was a statistically differences between control and experimental groups (p < 0.05). The final setting time was greater for CLG and 15% Na₂HPO₄.

Conclusions: The addition of amorphous CLG-based liquid phase and 15% Na₂HPO₄ to WMTA reduced the setting time and these combinations may be a viable option in single visit procedures.

FC117
Advantage of Combined Amalgam-Composite Restoration: In Vitro Leakage Study
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Purpose: Evaluate the leakage of Class II box composite restorations and compared with composite lined by flowable composite and combined amalgam-composite restoration.

Method: Fifty-four Class II box shaped cavities were on the distal (1 mm below CEJ) surfaces, 18 cavities for each. Scotchbond Multi-Purpose adhesive system, Filtek Z250 composite, and a metal band system were used for all. After thermocycling test (1000 cycles, 5–55°C with 30 s) and dye immersion, the teeth were sectioned longitudinally in a mesio-distal direction and dye penetration was recorded.

Results: Combine amalgam-composite restorations showed less gingival leakage than composite alone and composite lined by flowable composite restorations, significantly.

Conclusion: For class II box composite restorations, the gingival leakage, below CEJ with missing enamel, can be reduced by pacing amalgam gingivally combined by composite occlusally.

FC118
Influence of TiO₂ Nanoparticles on Surface Microhardness and Roughness of Experimental Resin Composites
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Aim: The aim of this study was to evaluate the effect of additional TiO₂ nanoparticles on the surface microhardness and roughness of experimental resin composites.

Materials and methods: A light curing resin matrix was made by mixing 60 wt% Bis-GMA and 40 wt% TEGDMA. Silane coated glass filler was added in the ratio of 65 wt% of the resin composites. TiO₂ nanoparticles were added with the concentrations of 0.1, 0.25, 0.5 and 1 wt% by sol-gel methods. TiO₂ was not added in the control group.

Disk shaped specimens (diameter = 5.0 mm, thickness = 2.0 mm) were pressed between two glass slides to obtain standardized smooth surfaces. The disks were light polymerized for 40 s. After storage (37°C/1 week) the microhardness was measured.
quantified by applying 0.05 kg load to a pyramid diamond point. The dimensions of three indentations produced on the surface of each sample were measured at the microscopic level, an average taken and used to determine the Vickers hardness number (VHN). For surface roughness test, specimens were prepared in the same protocol (diameter = 8.0 mm, thickness = 2.0 mm) then surface roughness were measured by profilometry. The data were analyzed by Kruskal–Wallis and Mann–Whitney U tests (α = 0.05). Surface property were evaluated under a Scanning Electron Microscope (SEM).

Results: The results showed that microhardness of all experimental composites were significantly different when compared to the control group (p < 0.05). For surface roughness there were significant differences among groups (p < 0.05). According to SEM observations homogeneity of fillers and TiO2 was similar among groups.

Conclusions: Surface microhardness and surface roughness increased by addition of TiO2 nanoparticles in experimental resin composite.

FC119 Cytotoxicity of Resin Cements on Bovine Pulp-Derived Cells
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Aim: The aim of this study was to evaluate the cytotoxicity of five resin cements on the bovine pulp-derived cells.

Materials and methods: The resin cements materials [Bifix QM (VOCO), Choice 2 (Bisco), Rely X U200 (3 M ESPE), Max Cem Elite (Kerr), Multilink Autonix (Ivoclar)] were evaluated. Totally, ten cylinders (5 x 2 mm), prepared by using different resin cements were incubated in αMEM culture medium for 72 h according to ISO 10993-5 standards. Bovine pulp-derived cells (SVNeo3, immortalized by Schmalz G. et al.) were maintained with αMEM containing 10% fetal bovine serum. A real-time cell analyzer (RT-CA, xCelligence system) was used to evaluate the effects of resin cements on the cell viability. After seeding 200 µl of the cell suspensions into the wells (7500 cells/well) of the E-plate 96, bovine pulp-derived cells were treated with bioactive components released by the cement and monitored every 15 min for 96 h. ANOVA and Tukey-Kramer tests were used.

Results: While Multilink Autonix, Choice 2 resin cement reduced significantly cell viability, Bifix QM, Rely X U200, and Max Cem Elite were severely toxic (p < 0.001) for bovine pulp-derived cells when compared to untreated control during observation period. Inverted microscopy images of the bovine pulp cells confirmed the results of cell viability experiments.

Conclusions: The results indicate that tested resin cements were toxic, and further studies are required evaluating molecular level cytotoxicity markers.

Free Communication Session 19 | B343 | 29.08.2013 | 09:00–11:00

Theme: Preventive Dentistry: Caries

FC120 Dental Status of Primary School Pupils at Al-Sheik Othman District, Aden 2009
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Ministry of Health-Yemen-Aden

Objective: The purpose of this study was to identify the frequency of destruction and lost of the first permanent molars in school pupils aged from 8 to 16 years.

Methodology: This prospective, cross sectional study was carried out at two basic schools belonging to Al –Sheik Othman District, Aden governorate in June 2009. Two hundred school pupils aged from 8 to 16 years were randomly selected. They were classified according to the age into three groups (8–10, 11–13 and 14–16 years). Participants were examined for dental status and caries in the clinic room at each school. The data were analyzed using percentage and t-test.

Results: All participants showed erupted first permanent molars (FPMs). No female participants were found to extract any of the FPMs while 1% of the males lost the lower right one. Sound teeth were found in females and males by 31% and 39%, respectively. The incidence of caries in females was near to 60% in almost all three age groups. Interestingly, a significant increasing incidence of caries among males was found (46.4%, 57.1% and 73% correspondingly to age groups).

Conclusions: The most frequent cause of dental destruction of the first permanent molars was caries. Emphasis should be given to dental hygiene education for school pupils as well as parents.

FC121 A Minimal Invasive Technique in Managing Carious Primary Anterior Teeth
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Background: Several studies have provided the evidence that cariogenic bacteria once deprived of their source of nutrients by a restoration of sufficient integrity, die or remain dormant and thus the lesion does not progress. The Hall Technique appeared to offer an effective treatment option for carious primary molar teeth. This encouraged this trial of focusing on infection control rather than the surgical approach of caries management. Where a simplified minimal intervention, and child friendly approach to managing the carious primary anterior teeth was performed.

Methods: Sixty primary upper anterior teeth from 15 healthy children aged 2–4 were included in this case series study. The teeth were free of any clinical or radiographical signs and symptoms of pathological pulpal involvement. The teeth were prepared to receive full coverage crowns using the preformed Nu smile crowns.
Minimal caries removal was performed during the preparation; crowns were cemented using Riva, without local anaesthesia. The subjects were followed up clinically and radiographically at 6 and 12 months respectively.

**Results:** The technique was highly acceptable by the children and their parents. Clinical and radiographic follow up revealed that all treated cases did not show any signs of irreversible pulpitis throughout the follow up period.

**Conclusion:** Given the proper case selection this novel technique may offer a good alternative to conventional approaches of restoring decayed primary anterior teeth.

**FC122**

**Effect of Acid Etching and Different Er:YAG Laser Procedures on Microleakage of Three Different Fissure Sealants in Primary Teeth After Aging**

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**Aim:** The purpose of this study was to evaluate the effects of different surface conditioning procedures on microleakage and unfilled area proportions of three different fissure sealants (Aegis, Helioseal and Helioseal F) in primary molar teeth.

**Methods:** One hundred and fifty teeth were randomly divided into five main groups according to surface conditioning procedures. These main groups are: acid-etching (Group A); laser 3.75 W (Group B) and 5 W (Group D); acid-etching combined with laser 3.75 W (Group C) and 5 W (Group E). The samples were aged by thermocycling (10,000 cycles) and water bath (6 months). Afterwards, they were immersed in basic fuchsin solution for 24 h and bucco-lingual sections were obtained from each tooth. Digital images were taken using a stereo-microscope and the microleakage and unfilled area proportions were assessed by using a software system.

**Results:** The Aegis FS containing amorphous calcium phosphate was found to exhibit the lowest microleakage in all surface conditioning procedures. Unfilled areas in particular were not detected in Groups C and E of all FSs.

**FC123**

**Antibacterial Effect of Novel Formulations Containing Lysozyme and Lactoferrin**

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**Aim:** The aim of this study was to determine the antibacterial effect of different formulations containing lysozyme, lactoferrin and drug delivery system as poloxamer 407 and/or freeze dried liposome (FLD) containing N-[1-(2,3-Dioleoyloxy)propyl]-N,N,N-trimethylammonium methylsulfate on Streptococcus sobrinus and Streptococcus mutans in comparison with 0.2% chlorhexidine gel.

**Materials and methods:** The amount of biofilm formation of Streptococcus sobrinus and Streptococcus mutans for 24 h on 160 sterile hydroxyapatite discs after application of different formulations was evaluated. The study groups consisted of different formulations as: (i) Sorensen’s Buffer Solution (SBS), (ii) the gel formulation containing poloxamer 407, (iii) lysozyme and lactoferrin dissolved in SBS, (iv) poloxamer 407 combined with third formulation, (v) FLD dissolved in SBS, (vi) FLD combined with poloxamer 407 which is dispersed in SBS, (vii) FLD combined with third formulation, (viii) lysozyme and lactoferrin dissolved in SBS, then incorporated into poloxamer 407 and combined with FLD. The positive control group was 0.2% chlorhexidine gel and negative control group consisted of empty hydroxyapatite discs. The statistical evaluation was carried out with Kruskal–Wallis and Dunn’s multiple comparison tests.

**Results:** The formulations with poloxamer 407 were more effective in the inhibition of biofilm formation of tested bacteria (p < 0.05). In the positive control group, there was no bacterial growth.

**Conclusion:** Among formulations with poloxamer 407, the formulation containing Lysozyme and Lactoferrin with poloxamer 407 exhibited the highest efficiency on tested bacteria. The formulations which showed antibacterial effect, should be further evaluated for longer periods, using kinetic methods in addition to determining cytotoxicity.

**FC124**

**Effect of CPP-ACP on Hard Dental Tissues Remineralization**

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**Aim:** This in vitro study was designed to investigate if Casein-Phosphopeptide with Amorphous Calcium Phosphate complex (CPP-ACP) containing paste affects remineralization of enamel, dentine and cementum.

**Materials and methods:** One hundred and fifty noncarious human premolar teeth extracted for nonpathogenic reason were used and divided into three equal groups each containing 50 teeth. First group for enamel specimens, 2nd group for dentine specimens and 3rd group for cementum specimens. These were obtained by grinding of teeth. All specimens were immersed 7 days in demineralized agent, after that CPP-ACP was applied on specimens in artificial saliva for 7 days. Remineralization and demineralization were evaluated by analyzing the mean of radiodensity of digital X-ray images of each specimen in all steps using Digora system.

**Results:** showed increase of remineralization enamel, dentine and cementum after application of CPP-ACP paste.

**Conclusion:** The increase of remineralization of all hard dental tissues could be attributed for using CPP-ACP and the decrease in the incidence of caries.
Effect of Water Rinsing After APF Gel on Plaque Acidity
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Purpose: The aim of this study was to determine whether rinsing with water or cleansing teeth after topical fluoride therapy affected plaque acidity.

Methods: This randomized, controlled, crossover, in situ study was conducted on 25 dental students who wore an acrylic mandibular appliance containing one enamel block. The patients were subjected to four treatment protocols: acidulated phosphate fluoride (APF) application followed by rinsing the mouth with water (i) after 30 min (APF-30); (ii) after 15 min (APF-15); (iii) immediately (APF-0); (iv) after cleansing the teeth with a cotton roll immediately following APF (APF-cotton); or no fluoride therapy (control). After 48 h, plaque pH was measured before and 5, 10, 15, 20 and 30 min after rinsing with 10% sucrose solution.

Results: The least pH changes, the lowest pH drop, and the fastest pH recovery were found in APF-30 and APF-15 groups. This was followed by APF-0 and APF-cotton groups.

Conclusions: The data suggest that rinsing with water or cleansing the teeth with a cotton roll immediately after APF gel application did not seem to influence the inhibitory effect of fluoride on plaque acidity.

Mineral Mapping of Incipient Fissure Enamel Lesions
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Aim: The aim of this study was to characterize the mineral content and distribution of a typical uncavitated fissure enamel lesion.

Materials and methods: Human premolar teeth extracted for orthodontic purposes were collected from oral surgery department according to protocols approved by the University bioethics committee. Teeth were brushed clean, and the roots mounted in resin inside a container and the crown section stored in HBSS.

For evaluating the mineral density of the lesions, 3-D mineral density (MD) plots were generated using XRADIA, Xray microtomography system. Imaging was undertaken using continuous mode exposures at 0.5 s intervals and binning value of 2, resulting in a pixel resolution set to 14.8 μm. Reconstructed Tiff images were then imported into FIJI (The standard NIH image analysis software) and Gaussian blur function was applied to the images in order to reduce the noise. The adjusted images were then exported to Origin software to produce graphical plots of the fissure lesions.

Results: The results demonstrated the presence of a typical mineral dense surface layer on all external surfaces of the lesion. In addition, the pattern of the mineral loss showed that more mineral is lost from fissure walls, rather the fissure floor which is possibly due to the orientation and direction of the enamel rods.

Conclusions: The results from the MicroCT scans showed specific characteristics of the incipient lesions at the enamel fissure, indicating that this is a reliable method for enabling 3D observations of the initial stages of fissure carious lesions development.

Consequences of Untreated Caries in Preschool Children Expressed According to Pufa-Index
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Introduction: Dental caries is one of the most widespread diseases of the world. High untreated caries with other complications especially in children, is accompanied not only with severe health problems but also with social problems.

Aim: To determine the prevalence of dental pathology (pulpal involvement, ulceration, fistula and abscess), as a complication of untreated dental caries, in preschool children.

Methodology: In the study, 478 children of both sexes, ages 3–6 years were included. This was a cross-sectional study conducted in randomly selected kindergartens in the municipality of Pristhina, capital of Kosovo. Data were collected through clinical examination. Diagnostic criteria were calibrated with an inter-examiner reliability of kappa index. The Pufa- index records, the presence of severely decayed teeth visible pulpal involvement (p), ulceration caused by dislocated tooth fragments (u), fistula (f) and abscess (a).

Results: The prevalence of caries (dmft > 0) was 76%, with a mean dmft of 5.97. The prevalence of Pufa index was 30%. The mean number of teeth affected (PUFA) was around 1. The “Untreated caries Pufa Ratio” was 18% of the decayed (d) component that had progressed to pulpal involvement.

Conclusion: Pufa-index in preschool children has shown the neglected problem of untreated caries and its consequences. Application of Pufa index could serve for epidemiological reasons to health care providers as a relevant indicator in the planning of dental treatments.
Aims: Our goal was to develop and analyze a new mouthwash based solely on natural medicinal herbs and volatile oils. Materials and methods: Our mouthwash was prepared by 40% ethanol extraction of six well known medicinal plants completed with three different essential oils. Antimicrobial effects of the mouthwash were examined on oral pathogens *Staphylococcus aureus*, *Streptococcus sanguis*, *Escherichia coli*, *Lactobacillus plantarum* and fungi like *Candida albicans*, *C. krusei*, *C. glabrata* and *C. parapsilosis*. We used tube dilution method. Direct bactericidal effect was studied by fluorescence microscopy with propidium iodide stain. Bioautography was performed on Merck F254 silica layer, using *Staphylococcus aureus* and the mentioned bacteria and fungi. For controls gentamicine and/or fluconazole were tested. Flavonoid spectrum was analyzed by densitometry after separation with TLC. The effect on the saliva proteins was examined by SDS-PAGE (Laemmli).

Results: In tube assay the mouthwash showed dose dependent effect with highest inhibition effect of 188.7 times slower multiplication rate compared to the control. In the propidium-iodide assay the 40% ethanol control contained 4%, while the mouthwash treated sample expressed 92% dead bacteria. In bioautography, the largest inhibition zone of our mouthwash was 9 ± 1 mm, the controls were 6 ± 3 mm; we could separate 12 different flavonoids and the salivary protein pattern was not changed after mouthwash exposure.

Conclusion: Our completely natural mouthwash preparate possesses significant antimicrobial effect, is rich in flavonoids and does not modify salivary proteins.

FC129

Oral Hygiene and Dental Caries in 5- to 6-Year-Old Children in Ajman, UAE

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Objective: To investigate the association between oral hygiene and dental caries in young children in the Emirate of Ajman, United Arab Emirates.

Methods: A one-stage cluster sample was used to randomly select children. Clinical examinations were conducted by a single examiner. Parents completed questionnaires seeking information on child and family characteristics, dietary habits and oral hygiene practices.

Results: The total number of children sampled was 1297. Dental examination and questionnaire data were obtained for 1036 (79.9%). Frequency of eating per day and snack consumption level were both significantly associated with plaque score. Children who brushed their teeth more often had lower plaque scores. The observed association between mean plaque score and mean dmft suggests that children with high plaque scores are more likely to experience caries.

Conclusions: Brushing with fluoride toothpaste was under-utilized in Ajman. Tooth brushing therefore needs better promotion and reinforcement.

Free Communication Session 20 | B360 | 29.08.2013 | 09:00–11:00

Theme: Implantology: Oral Pathology

FC130

E-Cadherin as a Marker for Nodal Metastasis in Head and Neck Squamous Cell Carcinoma

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Objective: To identify E-cadherin as a marker for prediction of lymph node metastasis in head and neck squamous cell carcinoma. Materials and methods: Cross-sectional analysis of 54 subjects with head and neck squamous cell carcinoma, who underwent neck dissections, was carried out. Expression of E-cadherin was evaluated using immunohistochemical analysis and traditional histological parameters, and the correlation of E-Cadherin with the histologically verified presence of regional metastases was determined. The data was subjected to descriptive statistics and chi square using Spss v.16.0.

Results: Fifty-four patients included 33 males (61.1%) and 21 females (38.9%) aged from 18 to 73 (mean 44.8 ± 12.7). A statistically significant relationship between the Downregulation of E-cadherin and histologically verified presence of nodal metastasis was established (p-value: 0.000).

Conclusion: This study shows that low E-cadherin expression is useful for predicting lymph node metastases in cases of head and neck squamous cell carcinoma.

FC131

Expression of Alpha Smooth Muscle Actin on Stromal Myofibroblasts in Oral Squamous Cell Carcinoma

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Objective: To find out the expression of alpha smooth muscle actin for myofibroblast identification by immunohistochemistry in oral squamous cell carcinoma (OSCC).
Materials and methods: Cross-sectional study of 80 specimens of excisional biopsy of oral squamous cell carcinoma, was carried out. Expression of alpha smooth muscle actin (ASMA) was studied by means of immunohistochemical analysis and histological grading parameters, and the association of ASMA with the histological grading was determined. The data was subjected to descriptive statistics and chi-square using SPSS version 16.

Results: Eighty patients included 50 males (62.5%) and 30 females (37.5%) aged from 18 to 78 (mean 45 ± 14.1). A statistically significant relationship between the expression of ASMA and histological grading of OSCC has been associated with poor prognosis was established. (p-value: 0.000).

Conclusion: This study displays that high expression of ASMA is useful for predicting tumoral invasive behavior of oral squamous cell carcinoma.

Objectives: To evaluate the accuracy of a fluorescence screening system “VELscope®” (VE) and its ability to diagnose the dysplasia and malignancy comparing to cyto- and histopathological examination.

Study design: A total of 135 suspicious lesions of 105 patients (n = 53 female, n = 52 male) aged between 21 and 82 year-old (55.52 ± 15.04) were investigated with a standard oral examination (OE) and then with VE, followed by smear and/or biopsy. Association between OE and VE was evaluated and was compared to histopathology.

Results: The autofluorescence ranged from green to gray-brown fluorescence loss. Seventy-three lesions revealed fluorescence loss (gray-brown and brown-black) and six lesions showed orange-red, whereas 56 lesions revealed no visibility. When compared with gold standard histopathology, the sensitivity and specificity of VE were found to be 93.33% and 56.25%, whereas positive predictive value (PPV) and negative predictive value (NPV) were found to be 54.54% and 93.75% respectively. VE findings were statistically different from the gold standard histopathology and also from the cytology (Mc Nemar’s Test, p = 0.001). There was no statistical difference between the results of OE and histopathology (p = 0.481).

Conclusions: Based on our clinical experience and the findings of this study, it can be concluded that VE is rather subjective, requires clinical expertise and also needs training in order to achieve correct interpretation. VE seems not to be effective for aiding the visualization of potentially malignant, malignant and reactive lesions. VE results have to be interpreted precisely, because benign reactive lesions may show similar fluorescence loss.

A Case of Aggressive Calcifying Cystic Odontogenic Tumor
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The calcifying cystic odontogenic tumor (CCOT) first identified as a separate and distinct lesion by Gorlin et al. in 1962, is an uncommon benign lesion, consisting of a proliferation of odontogenic epithelium and scattered nests of ghost cells with calcifications that may form the lining of a cyst or present as a solid mass. We report a case of calcifying cystic odontogenic tumor in 35 years old female in the body of the mandible.

A Rare Foreign Body within a Radicular Cyst in a Child
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Aim: Radicular cyst is the most common odontogenic cystic lesion of inflammatory origin. Caries are recognized as the most common aetiological factor in radicular cyst formation, followed by traumatic injuries to the teeth.

We present a case of a rare foreign body within a radicular cyst in a child and we discuss the clinical and radiographic presentation, as well as the adequate treatment and follow up.

Observation: A healthy 11-year-old girl reported to the oral medicine and oral surgery department, University clinic of dentistry, Monastir, with a complaint of a gingival swelling surrounding the right maxillary central and lateral incisors.

Past history revealed that she had been subjected to a trauma. The girl claimed that sometimes, she used a toothpick in order to relieve the pain she felt, especially during acute episodes.

Intraoral examination revealed that the maxillary central incisors were extremely damaged by the caries. There was an overt tender swelling over the right maxillary lateral incisor. Orthopantomogram confirmed the presence of a well circumscribed radiolucency involving the root of the right maxillary lateral incisor and the distal aspect of the adjacent central incisor with a foreign body within it.

Conclusions: Based on history, clinical and radiographic examination, a provisional diagnosis of radicular cyst associated with the right maxillary lateral incisor was made. The treatment consisted in treating the right maxillary lateral incisor endodontically in association with the enucleation of the radicular cyst and the removal of the foreign body.
FC135
Assault Related Oral and Maxillofacial Injuries Reported at General Hospital Dental Centre, Lagos, Nigeria
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Aim: The facial region has been the most common site of injury following violent episodes. The purpose of this study was to analyze the prevalence and pattern of assault-related maxillofacial injuries treated in General hospital Lagos.

Material: The present study comprised 33 patients with assault-related maxillofacial fractures treated in the Department of Oral-Maxillofacial Surgery, Dental center, General Hospital, Lagos, between May 2008 and April 2009.

Methods: This was a year prospective study of assault-related maxillofacial fractures treated in the Department of Oral-Maxillofacial Surgery, Dental center, general Hospital Lagos. A proforma was filled for study subjects to obtain patient biodata, etiology of injury, site of injury in the maxillofacial region, time interval between injury and presentation at hospital, treatment and associated complications.

Results: The mean age of the patients was 28.15 ± 7.4 year with only 12% having post-secondary education. The male-to-female ratio was 3:1. Twenty four (63.7%) of the patients did not have a skilled job. The most common causes of assault-related injuries were fights, most frequently facial blows, accounting for 87.9% of all patients. Thirty-nine per cent of the fractures occurred in the maxillary dentoalveolar region.

Conclusion: It seems that mostly young men suffer assault-related maxillofacial injuries. A contributing factor to the increased disposition for violence in our environment could be illiteracy and unemployment.

FC136
Clinicopathological Significance of Surviving Expression in Odontogenic Tumors
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Aim: Aim was to evaluate the expression of the antiapoptotic Survivin in odontogenic tumors and its role in their tumorigenesis.

Materials and methods: Study was retrospective, where 20 specimens of odontogenic tumors were collected and analyzed with emphasis on the clinical data and pathological diagnosis of the tumor. Normal developing tooth germ sections were used as control.

Immunohistochemical markers of primary monoclonal antibodies of Survivin were used to stain those sections. Presence or absence of Survivin and intensity of its expression were then checked under light microscope using quantitative method.

Results: Survivin was detected in all benign and malignant odontogenic tumors, and to a much lesser extent in normal developing tooth germ.

Survivin Immunoeexpression was very intense in malignant and locally invasive benign tumors.

Conclusion: Survivin proved to have a role not just in the tumorigenesis and cancer progression but also in the proliferation of benign and malignant odontogenic tumors.

Analysis of Survivin expression could be used as an important cancer diagnostic marker and a source of prognostic information in odontogenic tumors. Moreover, further research could open new ways for immunological treatment of odontogenic tumors using anti Survivin vaccinations.

Theme: Implantology: Implantology

FC137
The Contribution of 3D Navigation in the Implanto-Prosthetic Rehabilitation
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The fundamental characteristics of contemporary dental medicine are precision, avant-garde, technologization and successful clinical finality.

The purpose of this study is to individualize the opportunity of using the navigation systems in the implan-to-prosthetic rehabilitation, quantifying the necessity of classical maneuvers of measurements and visualization in various dimensional spaces, in agreement with the particularity of the clinical case.

Materials and methods: For this study, the Robodent 3D navigation system was used for therapy of edentulous patients (200 patients) designed so as to increase the degree of precision of the insertion of dental implants. The devices and necessary materials are represented by a physiodispenser of implants with various sizes and lengths depending on the anatomical structure of the bony arch.

Results: The classical measurement of the implant site is carried out both on Computer Tomography and on pre and post-implant orthopantomographies. The practical aspects were pre-visualized by means of 3D Dentsim simulations, through the (Image Guided Implantology) system.

Conclusions: The use of the 3D navigation system ensures the visualization in real time of the implant intervention, accuracy, precision and a reduction of the working time in relation to the classical technique.

The benefits of using 3D navigation systems are related to the post-implant tissue regeneration time, which is much shorter, the decrease of ecchymoses and edema that occur post-surgery in the classical method, the reduction of pain intensity after surgery due to a decrease in the tissue trauma.
Epidemiological Considerations for Stage 0 Bisphosphonate-Associated Maxillary Osteonecrosis
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Introduction: The risk of maxillary osteonecrosis associated with bisphosphonate therapy has been observed during the last decade. The number of documented cases has risen spectacularly during this timespan. However, the risk factors and pathogenetic mechanisms have yet to be established.

Aim: In the present study, we aim to establish the epidemiological characteristics of patients with stage 0 bisphosphonate-associated maxillary osteonecrosis.

Materials and methods: We have conducted a descriptive study employing a group of 21 patients, aged 50–84 (medium age 67.14), diagnosed with stage 0 bisphosphonate-associated maxillary osteonecrosis, in accordance with AAOMS diagnostic criteria. The study was made during January 2011–March 2012. Epidemiological data have been processed using IBM SPSS Statistics v19 for Windows.

Results: It has been found that 9.52% of the analyzed patients had radiological changes, suggestive of manifest osteonecrosis and no significant correlations with age or sex have been observed. 9.52% of patients were undergoing corticotherapy, percentage which was found to be statistically significant (p = 0.042) and 76.19% of patients exhibited anemia, a correlation which was also found to be statistically significant (p = 0.049). 19.04% of the original group associated Type 2 Diabetes Mellitus, a correlation which was found to be statistically insignificant.

Conclusions: Corticotherapy and anemia have been found to be significant risk factors for bisphosphonate-associated maxillary osteonecrosis. Further studies employing extended sample sizes may clarify the significance of other findings.

Can Mothers Be Empowered to Screen Dental Caries in Their Own Preschool Children?
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Objective: To assess whether mothers can be trained to screen caries in their preschoolers.

Methods: A cross sectional study involving 81 mothers of preschool children aged 4 and 5 years old from kindergartens in Pahang, Malaysia who were trained in a 3-h training programme by the researcher to detect caries in pre-schoolers based on a simplified (frank, cavitated) caries detection criteria by WHO (1997). After the training, all mothers performed caries screening on their children at the workshop and at home. The findings were checked for validity by comparing mothers’ findings with researcher’s findings as the gold standard.

Results: The overall prevalence of caries in the sample was 88.9%, with mean dmft of 7.10 (SD 5.07). The sensitivity, specificity, positive predictive value and negative predictive value of mothers’ caries screening at child level were 93.1%, 66.7%, 95.7%, 54.5% and at tooth level were 76.1%, 93.7%, 90.7% and 87.9%, respectively. The reliability of mothers’ screening within 24–48 h after training were substantial (κ = 0.71) at child level and almost perfect (κ = 0.84) at tooth level.

Conclusions: Mothers were able to achieve good level of validity values in the caries screening activity of their pre-school children. This study provided evidence that it was feasible to train and empower mothers with basic skill to screen caries in their own preschool children.
FC141
Delay in Diagnosis of Oral Cancer in Malaysian Population
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Purpose of the study: A multicenter cross sectional study to determine the prevalence and referral pattern of delay in diagnosis of oral cancer in Malaysian population.

Materials and methods: Clinical records, referral letters and histopathological results of 87 patients with oral squamous cell carcinoma were retrieved from 1st April 2007 until 31st March 2008. An interview was conducted and a form of data collection was also implemented to retrieve information. "Delay in diagnosis" was defined as the period of time between the patient first noticing a symptom until definitive pathological diagnosis.

Result: Prevalence of patient and professional delay were 83% and 31% respectively. “Asymptomatic” and “hope of healing” were the major reasons for patients delay whereas; “Awaiting biopsy report” was the main reason for professionals delay. Main determinants for patients delay were alternative treatment, alcohol, ulcers and swelling as initial symptoms and tumour stage. The only determinant for professional delay was duration of referral. More than half of the patients were referred directly to the appropriate centre upon first consultation with the health care professionals.

Conclusions: This study suggests that a continuous formal education for health care professional, public education reinforced regarding sign and symptoms of oral cancer, selective screening programme and the need of comprehensive referral system are essential to achieve early diagnosis and to improve patients’ quality of life as result of less aggressive and mutilating treatment.

FC142
Effect of Doctor-Patient Communication on Patient Satisfaction
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Objectives: To assess patients’ perception of the communication between them and their dentist and to determine the level of patient satisfaction after treatment.

Methods: A descriptive cross-sectional study was done using 100 patients from a Tertiary Institution and 100 patients from a Secondary institution. Data collection was by interviewer administered questionnaires consisting of five sections. Data was analyzed using Epi info3.5.1, Fisher’s Exact was used for test of association.

Results: Patients satisfaction is positively related to the level of information given by the dentist (p = 0.004, Fisher’s exact), clarity of information about diagnosis (p = 0.000, Fisher’s exact), informed consent (p = 0.039, Fisher’s exact), adequacy of dentist explanation (p = 0.000, fisher’s exact) and understanding of post-operative instructions (p = 0.004, Fisher’s exact). There’s statistical significance between overall level of satisfaction and how comfortable patient is talking to the dentist (p = 0.002, Fisher’s exact).

Conclusion: Findings from this study suggests that patients’ satisfaction is positively related to the communicative behavior of dentists. Dentist should not only give information to patients adequately, but should also pay attention to their personal communication style. It also indicate that Dentists need to be continuously trained on communication Skill and interpersonal Relationship which will improve the outcome of their treatment and patients’ satisfaction. This will as well aid improvement of service quality management and communication in dentistry.

FC143
Primary Oral Health Care and Optimal Oral Health
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Aim: The analysis of oral health of patients up to 19 years old based on long-term dentistry work, calls for need of implementing legal obligations for personal responsibility for own oral health. Meanwhile, the Programme of Multidisciplinary Promotion of Children’s Oral Health has been implemented in the City of Nis since 2010.

Materials: Within the Programme, the results of the systematic examination of oral health of 570 patients were analysed. The sample was composed of 19 generations, each containing 30 patients by random choice. Parameters used for oral health estimation were:
(1) caries prevalence and progression in frontal and lateral teeth, both primary and permanent,
(2) presence of dental plaque as the indicator of oral hygiene,
(3) condition of gums and periodontal tissues,
(4) presence of dental anomalies,
(5) oral health of the children and young with special needs and
(6) the results of interview with students of the final class in secondary schools.

Results: The analysis revealed a significant degree of poor oral health and indicated the necessity of educational work from the very beginning of family founding and the importance of establishing good practice of behaviour, habits and attitudes for achieving well being.

Free Communication Session 22 | B342 | 29.08.2013 | 11:30–12:30

Theme: Dental Treatment and Restorative Dentistry: Prosthetics

FC144
Analysis of Incidence and Types of Complete Denture Fractures
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**Objective:** The aim of this study was to determine and analyze the causes of complete denture fractures.

**Materials and methods:** A total of 1663 complete denture wearers who had experienced technical problems with their dentures were analyzed. For each patient the following variables (denture base fractures; the type and causes of fractures, fracture incidence, debonding of acrylic teeth) were recorded. The collected data was analyzed using Fisher’s Exact test and the chi-square test at a significance level of test $p < 0.05$.

**Results:** 82.2% of the complete dentures were upper dentures and 17.8% were lower dentures. The fracture regions were 61.1% midline fracture, 13.5% anterior teeth region, 7.2% posterior teeth region, 6.8% paratuber region and 11.2% denture flange region. Most of the debonded acrylic teeth were anterior teeth (64%). 20.5% percentage of the fractured dentures had been previously repaired once or more. The midline fracture frequency was higher in lower dentures when compared with the upper dentures.

**Conclusion:** Midline fracture of the complete denture is the most common fracture type. Improvement of the processing techniques may reduce the incidence of fracture. Dentures should be constructed properly to strengthen the mechanical properties and to avoid inner stresses of acrylic resin. Strengthened acrylics are to be used for increasing fracture toughness of the conventional dentures. The surface area and the thickness of the acrylic portion of the lower complete dentures should be constructed carefully by the technicians. To eliminate denture base fractures thorough diagnosis, treatment plan and bilateral balanced occlusion is necessary.

**Assessment of Dimensional Stability and Accuracy of Three Different Elastomeric Impression Materials Using Micro-Computed Tomography**

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**Purpose:** Three dimensional accuracy and stability of impression materials are two topics still debated by researchers. The purpose of this study was to compare volumetric dimensional accuracy and stability of polyvinylsiloxane, polyether and newly formulated polyvinylsiloxaneether impression materials by using micro-computed tomography.

**Materials and methods:** A total of 42 impressions were made of stainless steel metal dyes. Polyvinylsiloxane, Polyether and Polyvinylsiloxaneether impressions were taken for volumetric dimensional accuracy and stability to measure by Micro-computed tomography ($\mu$CT). Impression materials were measured for dimensional stability after the impression was taken, 24 h later and 144 h later. For dimensional accuracy 21 impressions and 21 stone models of these impressions were measured. Volumes of digital models were calculated using 3D Studio Max.

**Results:** After polymerization, although polyether impression negative was shown to have the highest volumetric expansion, the highest shrinkage was observed in the same group after pouring to dental stone. Stone model of the polyether group was observed as the most accurate value of volume in comparison to the master model. The lowest volumetric dimensional change was observed in polyvinylsiloxaneether group at day 1 ($-0.004 \pm 0.001$) and the highest change was observed in polyether group at day 7 ($-0.052 \pm 0.004$).

**Conclusion:** From the standpoint of volumetric accuracy and stability, all three elastomeric impressions are clinically acceptable and $\mu$CT is a useful tool for assessments of volumetric dimensional changes.

**Biomechanical Aspects in Prosthetic Rehabilitation Through Removable Partial Denture**

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**Purpose:** Functional prosthetic rehabilitation of the patient through removable partial denture requires thorough understanding to achieve a balance between removable denture, maxillary bone and soft tissue. Biomechanical stability is the prerequisite of integration and meets morphofunctional main condition which is leading to general and local disease prevention in prosthodontics therapy.

**Materials and methods:** Evaluation of prosthetic rehabilitation was performed on a group of 22 patients, nine men and 13 women, which presented partial edentation, treated with removable partial dentures, over a period of 6 months. The residual ridges were assessed before and after prosthetic treatment and the data were analyzed by a group of four specialist in dental prosthetics, mathematically evaluating the biomechics both static and dynamic.

**Results:** Static stability was achieved on prosthetic in the clinical cases, indicating that the prosthetic edges were correctly achieved, elastic extremities for retention were engaged in the cone of retention and adaptation was optimal. In three of the cases we observed tendencies for mesialisation which generated highly improper transmission of forces with impairment on occlusion curves. When assessing the dynamics we noticed in two cases a distal displacement trend when presenting descendant crest and a accentuated sagittal occlusion curve.

**Conclusions:** When evaluated by specialists, 23% (5) had cause the biomechanical changes, while only three cases encountered an additional force exerted on the dental-periodontal support ($p < 0.05$). Treatment plan through removable partial denture must include from the beginning the biomechanics, based on data obtained from the clinical examination and paraclinical diagnosis.
Bond Strength of Different Adhesive Systems on Resin-bonded FDPs with Different Inlay-Retainer Designs

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Aim: Resin-bonded FDPs (RBFDPs) underwent many changes concerning design, over time; this induced the need for comparing the new fabrication methods with the old. The purpose of this study was to compare the resistance of modified inlay-retained RBFDPs with conventional inlay-retained RBFDPs to detachment from teeth using two different antibacterial adhesive system combinations for cementation.

Methods: Test groups were Mod-G1, Mod-G2, Gel-G1, and Gel-G2. Mod-G1 and Mod-G2 were representing the modified design; Gel-G1 and Gel-G2 were representing the conventional design. Mod-G1 and Gel-G1 were combining a 10-methacryloyloxydecyl dihydrogen phosphate dentin adhesive system with a chlorhexidine-based cavity disinfectant; Mod-G2 and Gel-G2 were using a 12-methacryloyloxydodecylpyridinium bromide antibacterial dentin adhesive system. Castings' fit surfaces were sandblasted and cemented with dual-cure adhesive cement. Specimens were subjected to tensile loading until separation and examined to determine the mode of failure. Results were statistically evaluated using one-way ANOVA and Tukey HSD (α = 0.05).

Results: Gel-G1 and Gel-G2 had significantly higher separation forces than Mod-G1 and Mod-G2. The mode of separation was of high frequency of adhesive failure at the metal-cement interface and tooth fracture was observed nearly in all specimens. No significant difference was detected between the two antibacterial adhesive systems. Conventional inlay-retained RBFDPs were more retentive than the modified. However, the simple application procedure and the retentive performance of the modified inlay-retained RBFDPs had been persuading about their high clinical potential.

Conclusions: It has been concluded that using an adhesive system incorporating an antibacterial element, rather than adhesive system combined with a separate antibacterial agent would be more favorable.

Extrinsic Stain Removal with a Toothpowder: A Randomized Controlled Trial

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Background: There is limited information on the use and efficacy of toothpowder in scientific literature. A commercially available toothpowder was compared with toothpaste in removing extrinsic dental stains.

Methods: In this single-blind, randomized controlled trial, 77 volunteers were included from a residential professional college. All study subjects (control toothpaste users and test toothpowder users) received a prophylaxis to remove all stains, plaque and calculus deposits by mechanical therapy. The study subjects were instructed to rinse with 5 ml of 0.12% chlorhexidine mouthwash for 1 min twice and one cup of double tea bag solution three times daily for 3 weeks. Subjects were randomized into test (n = 36) and control (n = 36) groups. Toothpaste (control) and toothpowder (test) was used for 2 weeks to see the effect on removing stains on the labial surfaces of 12 anterior teeth. For measuring dental extrinsic stains Lobene Stain Index was used.

Results: The amount of stain following the use of toothpaste and tooth powder was more controlled with the experimental toothpowder. For all sites combined, there was evidence that the experimental toothpowder was significantly superior to toothpaste in reducing stain area (p < 0.001), stain intensity (p < 0.001) and composite/product (area × intensity) (p < 0.001).

Conclusion: Stain removing efficacy of toothpowder was significantly higher as compared with toothpaste. A toothpowder may
be expected to be of benefit in controlling and removing extrinsic dental staining.

FC150
Findings in the Periodontium of Children Exposed to Environmental Tobacco Smoke
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The aim of the study was to clinically evaluate the association between the periodontal health of children and exposure to environmental tobacco smoking (ETS). Also to detect the cotinine levels in saliva and gingival crevicular fluid (GCF) in those children and to determine the count of anaerobic (strict and facultative) micro-organisms in the gingival crevice.

Subjects and methods: The study included 80 children with an age range 8–12 years. They were divided into two groups. Group (A) included 40 children who were exposed to passive tobacco smoke (PTS-exposed), and group (B) included also 40 children who were the unexposed controls (PTS-unexposed). Plaque index (PI), gingival index (GI), and gingival bleeding on probing (BOP), pocket depth (PD) and clinical attachment level (CAL) were measured. Gingival crevicular fluid (GCF) and saliva samples were collected to evaluate the level of cotinine using ELISA technique. For cultivation and detection of the count of anaerobic microorganisms GCF samples were also taken.

Results: The study showed no significant difference in PI, GI, BOP, and PD between the exposed and the unexposed groups. The mean total count of aerobes and facultative anaerobes was significantly less in the PTS-exposed group. The level of cotinine in the GCF was below the detection limit, while the mean salivary cotinine level in the PTS-exposed group was significantly higher than that of the unexposed controls.

Conclusion: It can be concluded that ETS exposure has an impact on the periodontal health of the selected children.

FC151
Using of Ibandronic Acid in Therapy of Periodontal Disease
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Objective(s): Bisphosphonates are used to prevent and reduce the bone resorption that occurs in metabolic bone diseases, such as osteoporosis. Bisphosphonates were used in the treatment of periodontitis in our clinic during 17 years.

Aim: The aim of this study was to investigate the effectiveness of ibandronic acid in treatment of periodontitis.

Materials and methods: The 194 patients (96 men and 98 women, mean age – 46.7 ± 6.3 years) with periodontitis (GP) were randomly selected on two groups – control group (85 patients) received basic initial periodontal treatment (SRP), main group (109 patients) – SRP and additionally prescribed ibandronic acid 150 mg/month during 3-month course and calcium supplement.

Metabolic processes of bone tissue were evaluated by the serum levels of biochemical marker bone tissue formation – osteocalcin (OC), bone resorption marker – deoxyypyridinoline (DPD) in urine.

Results: Among 100% of patients in the main group was not revealed any exacerbation of disease, among 18.8% (16 persons) (p < 0.005) in the control group exacerbation of periodontitis was revealed.

The concentration of DPD in the urine in the Ibandronat-treated group (4.64 ± 0.49 nmol) was persistently low compared with the baseline value (6.42 ± 0.76 nmol), and than in the control group (6.73 ± 0.57 nmol) after periodontal treatment (p < 0.05).

The serum concentration of OC (27.52 ± 0.29 ng/ml) was significantly higher in the Ibandronic group than the baseline level (21.17 ± 0.43 ng/ml) and in the control group (19.36 ± 0.82 ng/ml) (p < 0.05).

Conclusions: The application of ibandronic acid in complex therapy of periodontitis can inhibit the progression of alveolar bone resorption, normalization bone metabolism.

FC152
Romanian Young Adults’ Periodontal Risk Exposure and Oral Health Behavior – A Pilot Study
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Aim: The study was conducted to assess the level of oral health knowledge, oral hygiene behavior, periodontal disease perception and risk exposure of a group of Romanian students, to establish the necessity for a periodontal disease prevention program among Romanian young population.

Methods: The sample group included 338 first-year students from four randomly chosen faculties in Bucharest. A 25-question survey (16 multiple-choice questions, nine open-ended questions) was distributed in November–December 2012, aimed to evaluate oral health knowledge and practices, risk factors and symptoms of periodontal disease. The survey was approved by each faculty board. Data were analyzed using descriptive and correlational statistical methods.

Results: Response rate was 100%, the participants’ mean age was 19.4 years (±1.7), 80% females. Though 76% of subjects self-evaluate their oral health as good or very good, only 11.5% floss daily and 7.1% use mouthwash twice-a-day. Forty percent are smokers, 7.8% of women use contraceptives and 13% reported periodontitis cases in family history. Seventy-three percent felt gingival pain, 2% were informed by their dentist about having bone resorption, 39% received dental scaling in the past. Seventy-one percent saw a dentist in the last year, but 45% don’t feel confident about their periodontal status. No statistical significant correlations were revealed.
were obtained between the level of exposure to risk factors and the reported signs and symptoms of periodontal disease.

**Conclusion:** In this study, young adults were not exposed to risk factors in large proportions but their oral health behavior was unsatisfactory for the periodontal health maintenance; primary prevention programs are necessary.

**FC153**

**The Effect of Secondary Hemodialysis Therapy on Periodontium**

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**Aims:** The purpose of this study was to examine the effect of secondary HPT on the periodontium of patients on hemodialysis.

**Methods:** The experimental group consisted of 35 patients with secondary HPT, with chronic renal failure treated by hemodialysis (B group). A control group (C group) was formed from 35 healthy subjects. Blood samples were taken from the group, and the active intact parathormone was assayed. Also a clinical and X-ray periodontal examination was performed.

**Results:** Demographically, both groups were similar with no statistical difference. PI was also similar and GI was slightly greater in the C group. PD in the B group was identical to that of the C group. Likewise, CAL in the B group did not differ from CAL in the C group.

**Conclusion:** From this study it can be concluded that secondary HPT does not hyperparathyroidism have an appreciable effect on periodontal indices and radiographic bone height.

**Free Communication Session 24 | B360 | 29.08.2013 | 11:30–12:30**

**Theme: Implantology: Implantology**

**FC154**

**Accuracy of a Novel Stereolithographic Guide for Computer-Aided Implant Placement**

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**Aim:** Surgical guides prepared with stereolithographic CAD/CAM prototyping techniques are used to transfer the planned implant position to the surgical side. Operations may be safer and less invasive when individualized surgical guides are used for implant placement. A novel stereolithographic surgical guide is developed to overcome the disadvantages of conventional stereolithographic surgical guides. StendCad Beyond provides effective cooling of the surgical zone, tubeless application discard the possibility of contamination of the osteotomy side and only one surgical guide is sufficient to achieve placement of implants with different diameters. The aim of this study was the optimization of a new developed surgical guide system StendCad Beyond, and by using this system to place in implants in systemically healthy patients to calculate deviations between planned and placed implants.

**Methods:** Twenty-four implants placed on nine systemically healthy patients using StendCad Beyond system. Preoperatively patients scanned with CBCT, these images transferred to the interactive treatment planning programme and implant treatment plans were done. After implant placement postoperative CBCT scan taken from patients, planned and placed implant positions and angulations superimposed. Angular, coronal, apical and vertical deviations were calculated, found 3.09°, 1.45, 1.15 and 0.76 mm respectively.

**Results:** Within the limits of this study implant planning can be transferred to the surgical side successfully, StendCad Beyond system has many advantages over conventional stereolithographic surgical guides but further studies consisting more implants are needed to evaluate the accuracy of the system.

**FC155**

**Advanced Modalities in Dental Implant Imaging**

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**Introduction:** Radiography has been one of the frequently applied aids in human biometric research. It is essential to check for the accuracy of reproduction with respect to enlargement and projection. Without this accuracy errors can be incorporated into the measurement. Measurement is a vital aspect of interpretation, either of anatomical structures or pathological entities.

More recently, an increasing demand for dental implants for rehabilitation of edentulous jaws has raised an interest in the available imaging techniques to perform an accurate preoperative planning. It is essential to measure accurately the height of bone available for implant placement to avoid compromising vital structures such as the inferior alveolar nerve or maxillary sinus during placement of implants.

The introduction of Cone Beam Computed Tomography (CBCT) represents a radical change for dental and maxillofacial radiology. CBCT is a technology that provides cross-sectional images without superimposition or blurring and reduces the risk of radiation significantly. CBCT provides 3D imaging dedicated to the maxillofacial region at low cost and low dose of radiation.

**Conclusions:** CBCT allows 3D visualization of the oral and maxillofacial complex. This imaging modality eliminates the shortcomings of 2D imaging, produces a smaller radiation dose than that of conventional CT and enables clinicians to make more accurate treatment planning decisions, which should lead to more successful surgical procedures. It helps to measure the quantity and the quality of the bone available for the placement of implants.
FC156
Avoiding Crestal Bone Overload and Microgaps – Biomechanics of Conical Implant-Abutment Connections
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Introduction: Avoiding crestal bone loss around oral implants is one of the major objectives in implant engineering. According to the well-accepted theory by Frost unphysiologic mechanical overload causes high peak bone stress that could lead to bone loss. Other studies conclude bacterial contamination promoted by micro-gaps in the implant-abutment connection may cause bone loss as well. Previous biomechanical studies demonstrated the positive effect of conical connections with an angle <15°. These studies were based on limited mechanical principles. The objective of this study is to theoretically determine the influence of physiological dynamic loading forces on micro gapping and crestal bone stress.

Materials and methods: Seven three-dimensional non-linear finite element models with different angles of implant-abutment connections were generated and dynamic forces were applied. The respective bone strains and the resulting micro gaps were analyzed.

Results: Applying physiological dynamic forces (150 Ncm) to conical connections of dental implants with small angles (<15°) lead to absence of micro-gaps but to significantly higher bone loading compared to flat connections. Conical connections with an angle of 45° lead to absence of micro-gaps combined with a significant reduction of bone loading.

Conclusion: Despite the limitations of an in silico study, our results revealed, that under physiological conditions a 45° angle is the optimized conical implant-abutment connection to avoid micro-gaps and to reduce unphysiological bone overloading forces around dental implants.

FC157
Can Implants Successfully Supports Fixed Ceramic Fused to Metal Prosthesis in Periodontally Compromised Mouths
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Aim: To investigate by clinical and radiological measures the success of implants in supporting fixed prosthesis after extracting periodontally affected teeth.

Materials and methods: Three patients (one female and two males) of age range of (44–52 years) were having posterior and anterior teeth with gingival and periodontal disease with mobility of (1–3)°. These teeth were extracted with debridement and removal of granulation tissues. Then implants of different diameters and lengths of two systems were implanted with filling of resorbed area and sockets by bone substitute material in two cases. Antibiotic were given pre and postoperatively for period of 5 days. Chlorhexidine mouth washes and calcium and vit. D tablets were prescribed also. After period of 3–4 months these implants (15) were loaded successfully with (31 units- four fixed ceramic fused to metal prosthesis).

Image analysis and clinical examination by gingival and mobility index of these supporting implants and their perimplant soft tissues revealed excellent osseointigration and soft tissue attachment to implant collars after loading immediately and after 2–30 months period.

Results:
(1) Extraction with debridement of sockets of affected teeth can provide safe bed for implants.
(2) Antibiotic and chlorhexidine mouth washes are essential for healing process.
(3) A period of 3–4 months is sufficient for osseointigration and soft tissue attachments of and around the implants before loading.

Conclusion: Implants can replace periodontally affected teeth and supports fixed prosthesis to restore function and aesthetic of teeth in both sexes.

FC158
Block Allografts with and without Membranes in Horizontal Ridge Augmentation
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Aim: The aim of this study was to compare the potential of cortico-cancellous block allografts with and without using membranes in horizontal ridge augmentation.

Materials and methods: Sixteen partially edentulous patients (nine males, seven females) with a total of 18 localized alveolar ridge defects (ten maxillary, eight mandibular) were enrolled in this parallelled designed study. Baseline evaluations for horizontal dimensions were done by periodontal probe at the crestal area and with a ridge mapping caliper at 2 and 4 mm below the crest. Sites were randomly assigned to two groups: block allografts with and without barrier membranes. After a period of 6 months, at the reentry phase the measurements were done again. Independent t-test for comparing the results between the groups and paired t-test for comparing the results in groups were used for statistical analysis.

Results: No exposure happened except one of the cases in control group and no adverse effects were observed. The maximum gain in width was 5.4 mm (test group) and 5 mm (control group (p > 0.05). The mean gain in ridge width at the crest, 2 and 4 mm apically to crest were 4, 4.4 and 4.7 mm (test) 3.5,4 and 4.4 mm (control), respectively and the differences didn’t reach the significant level. Twenty-two dental implants were installed in the augmented areas and were successfully loaded with single crowns and fixed partial dentures.

Conclusions: The present study indicates that cortico-cancellous block allografts with and without membranes both could be effective in ridge augmentation and using barriers can be more logical in conjunction with particulate bone grafts.
FC159
Oral Health Knowledge and Behavior Among 12-Year Olds Female Students
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Aim: To assess the oral health knowledge and behavior of 12-year olds female students in Kuwait. To evaluate the oral health promotion program in the SOHP.

Materials and methods: From 2011 to 2012, 977 self-reported questionnaire were answered by a convenience sample of female students belonging to middle schools either at the SOHP centers or in their schools. All the six governorates in Kuwait were included in this cross-sectional study. Seventeen oral health knowledge and eight behavior questions were included in the questionnaire. These questions were focused on the oral health education information that had been delivered to schoolchildren by the SOHP oral health promotion team.

Results: Nine hundred and seventy-seven female students aged 12.8 ± 2.3 participated in this study. Overall, 40% of mothers and 43% of fathers had bachelor degree. Almost half of the questionnaires were answered at the SOHP centers (44%) and half at the schools (55%). The most of the participants were from Al-Ah-madi (25%) and Al-Jahraa (24%) governorates. Knowledge questions were answered correctly by 65% of the students. Almost half (44%) brushed their teeth twice a day and 66% of the participants did not use floss. Only 33% visited the dentist for routine check-up. Half of the participants visited the dentist in last 6-months.

Conclusion: Oral health knowledge among 12-year olds female students was satisfactory. This is not reflected in their oral health behavior which was not satisfactory. More efforts should be laid in future toward improving the oral health behavior of our school-children.

FC160
Malaysian Adult Oral Health Scenario: Changes Over a Decade
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Aim: NOHSA 2010, Malaysia’s fourth national adult oral health survey was conducted to assess trends in oral health status and treatment needs and, to obtain utilization and socio-dental information.

Materials and methods: A two-stage stratified cluster population-based survey targeted 14,444 adults aged 15 and above. A bilin-
gual validated face-to-face questionnaire and a clinical format adapted from WHO (1997) were used. Complex sample survey analysis used SPSS and sampling weights by state and strata (urban and rural) based on 2010 census data. Estimated population, percentage with 95% CI and mean (SE) were generated. Ethical approval was obtained from the Medical Research Ethics Committee, MOH.

Results: Comparing NOHSA 2000, there was increased prevalence of periodontal disease (87.2–94.0%), slightly decreased caries prevalence (90.3–88.9%) and increased prevalence of oral lesions (71.1–51.1%). One in three adults experienced oral health problems affecting their quality of life in the last 3 months and 95.2% of adults perceived they had good oral health. Only 27.4% and 40.1% had a dental visit in the last 1 and 2 years respectively and, only 15.9% had a preventive visit in the last 2 years.

Conclusions: Over a decade, there is still a high burden of caries and periodontal disease. Substantial gap exists between oral health perception and normative needs. Preventive oral health-seeking behaviour was low although annual utilization was within probability of a dental visit in the past 12 months in OECD countries. These findings would be used to revisit the national oral health plan.
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Aim: This paper provides a statistical analysis of epidemiological behavior of oral cancer in Colombia for a period of 20 years, 1990–2009, according to incidence based data provided by the Epidemiology Division at National Cancer Institute.

Materials and methods: Among the most outstanding results of the study highlights are: for 13 years oral cancer has ranked among the top ten diseases affecting the body. From 1990 to 1994 it was 8th with 2.64% among both sexes. The year 1999 had a staggering 3.05%, among both sexes. Men repeatedly stood among the top five most affected, reaching 4.3% in 1994. The tongue is the most affected area of the mouth.

Conclusions: The cultural multidiversity of Colombia combined with its vast territorial dimension produces the most diverse regional customs and habits. It is assumed that severity is much more dramatic. The findings have brought a focus on implementing a National Programme of Prevention and Early Diagnosis of Oral Cancer.

Assessing Oral Health Related Quality of Life in Oncologic Patients
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Aim: The aim of this study was to determine the oral complications and oral health related quality of life in oncologic patients receiving chemotherapy and radiotherapy.

Materials and methods: One hundred and fifty-seven oncologic patients were investigated in this cross-sectional study between 2010 October and 2011 February. Socio-demographic data, medical history, cancer types and treatment modalities were recorded. Dental status was evaluated by using DMF-T indices. Oral mucositis was measured by the WHO scale. QoL was assessed by oral health impact profile-14 (OHIP-14) and oral health related quality of life (OHQoL) questionnaires.

Results: There was statistically no significant differences in the ages, sex and education levels between chemotherapy (CT) and radiotherapy (RT) groups (p > 0.05). Furthermore, there was no significant differences OHQoL and OHIP-14 subscale scores between CT and RT groups (p > 0.05). The prevalence of oral complications such as presence of mucositis, tooth loss, xerostomia and dental carries in patients with head and neck cancer was significantly higher than the other types of cancer (p < 0.05).

Conclusion: The result of this study suggested that treatment modalities were associated with oral health related quality of life in oncologic patients, and the oral complications of patients with cancer may be more affected by head and neck radiation according to chemotherapy and the other’s regions radiotherapy.

Orthodontic Management of Impacted Teeth
Amr Nabil Asker
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Aim: Orthodontic management of impacted teeth is interesting topic in orthodontic, so I'll give small hint on impacted tooth management in orthodontictraction techniques and will present two cases of my work with photos and X-rays.

Case: First case female pt. 13 years old came to the clinic complaining of unesthetic appearence of incisors, after examination and panoramic X-ray i found retained tooth no.63 and impacted 23 at the position of the apex of upper lateral, this had formed dentigerous cyst around it and caused flaring of lateral incisors- after examination i diagnose its position labially with some bulging.

– I made open window above it, marsupialization of cyst-extract retained C-then attach bracket to upper impacted canine and began traction steps by double wire technique until it become in its normal position.

– Dentigerous cyst disappear after complete alignment and bone formed in old canine place with normal gingiva archticture, it took 1 year.

– Second case male patient complaining of unerupted upper centrals at age of 9.5 years, and erupted upper laterals-the space of upper centrals still found

– After examination I found labially impacted upper centrals with two supernumerary palatal to them that prevent centrals from eruption.

– I opened flap labially and palatally, remove two supernumery and expose upper centrals removing any bone above them-attach eyelets on them and began traction steps, i did closed traction in this case until it was highly impacted as appear in X-ray.

Conclusion: After 10 months complete alignment-healthy gingiva so i made retainer untill complete eruption of other permenant teeth.

Effect of Intra-Arch Tooth-Size Arch-Length Discrepancy on the Accuracy of Digital Models in Orthodontic Diagnosis
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Aim: The aim of this study was to evaluate the effect of intra-arch tooth size arch length discrepancy (TALD) on the accuracy of the digital models in orthodontic diagnosis.

Methods: A sample of 45 subjects having different types of malocclusion was included. For each subject, a set of plaster study model and digital model (OrthoCAD, Cadent, Carlstadt, NJ) were
obtained. Space analysis and arch width measurements were performed on both models. To evaluate the effect of intra-arch tooth size arch length discrepancy on the accuracy of the digital models, the sample was divided, considering each arch separately, into four groups; spacing, mild crowding, moderate crowding and severe crowding. All the measurements were statistically analyzed.

Results: When comparing the various measurements obtained from OrthoCAD digital models with those of conventional plaster study models in relation to the amount of intra-arch tooth size arch length discrepancy, no statistical significant difference was found. No correlation was found as well between the accuracy of OrthoCAD digital models and the amount of intra-arch tooth size arch length discrepancy.

Conclusions: OrthoCAD digital models were found to be as accurate as conventional plaster models in orthodontic diagnosis with no effect of intra-arch tooth size arch length discrepancy on its accuracy.

FC166
Effect of Menstrual Cycle on Orthodontic Pain Perception
Zehra Beri, Zeliha Muğe Baka, Mehmet Akin, Seza Apiliguullari, Faruk Ayhan Basciftci
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Aim: The aim of this prospective, randomized, controlled, crossover study was to evaluate the effects of the menstrual cycle phases on orthodontic pain perception.

Materials and methods: Twenty-five women, aged 16–20 years old, had regular menstrual cycles, scheduled to undergo the extraction of two upper first premolars for orthodontic treatment were enrolled in this study. Laceback ligatures were used to move canines distally. After activating lace back ligatures (T1) and 24 h later after activation (T2), each patient completed the Oral Health Impact Profile-14 (OHIP-14) and recorded the degree of pain on the visual analogue scale (VAS) and the verbal rating scale-4 (VRS-4). In the appointment, the phase of menstrual cycle of each patient was determined by asking some questions about her cycle. The next appointment was arranged in the other phase of each patient’s menstrual cycle. For statistical analysis of data, Mann–Whitney U- and Wilcoxon tests were used at p < 0.05 level.

Results: The mean orthodontic pain score was found 1.96 ± 0.79 and 47.20 ± 21.6 in follicular phase, 1.92 ± 0.81 and 46.40 ± 18.73 in luteal phase at T1 for VRS and VAS scales, respectively. Pain scores were similar in both groups. No statistically significant change was found between pain scores at T1 and pain scores at T2 in both luteal and follicular phases.

Conclusion: The menstrual phase did not change the perception of orthodontic pain due to activation of laceback ligatures and orthodontic pain did not increase significantly in the next 24 h after activation.

FC167
Effect of the Bracket Types on Microbial Colonization and Periodontal Status
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Aim: To investigate the effect of fixed orthodontic treatment with different bracket types on the levels of Streptococcus mutans (SM) and Lactobacillus (LB) in saliva and plaque and on the periodontal condition as well.

Methods: Thirty orthodontic patients (age range 14–16 years) were selected according to the following inclusion criteria: Angle Class I malocclusion with minimal crowding, nonsmoker, free of dental plaque, and no systemic disease. Patients who had used antibiotics and oral mouth rinses during the 3-month period before the study were excluded.

The patients were subdivided into two groups with random allocation of bracket type (conventional and self-ligating). Conventional brackets were ligated with ligature wires. Microbial and periodontal records were obtained before bonding (T1), 1 month after bonding (T2).

Microbial samples were collected from the stimulated saliva and labial surfaces of the upper and lower lateral incisors. To estimate the number of colony-forming units of SM and LB per millilitre of saliva and plaque Dentocult SM and LB Kits (Orion Diagnostica, Espoo, Finland) were used. The periodontal index (PI), gingival index (GI) and pocket depth (PD) values were recorded for evaluation of periodontal condition.

Bonferroni corrected Mann–Whitney U and Wilcoxon signed rank tests were used to compare the groups. p < 0.05 was considered significant.

Conclusions:
(1) The self-ligating brackets do not have an advantage over conventional brackets with respect to the periodontal status and colonization of SM and LB.
(2) Colonization of LB and SM and also the periodontal condition primarily depends on the patients hygiene motivation.

FC168
Effects of Self-Ligating Brackets on Halitosis, Periodontal and Microbial Parameters
Ruhi Naşçı1, Yener Ozar2, Serpil Çakakoğlu1, Muhammet Hakan Turkakramer1, Süleyman Onal3, Selçuk Kaya1
1Department of Orthodontics, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey, 2Department of Periodontology, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey, 3Department of Medical Microbiology, Faculty of Medicine, Süleyman Demirel University, Isparta, Turkey

Aim: The purpose of this study was to investigate the effects of self-ligating brackets on halitosis, periodontal status and microbial colonization.
Materials and methods: Ethical approval was obtained from the ethical committee and 46 patients (27 female, 19 male) scheduled for fixed orthodontic treatment (ages, 11–16) in the permanent dentition were selected for this study. Patients were randomly divided into two groups: 23 patients treated with self-ligating brackets (Group SLBs) and the others with conventional brackets (Group CBs). Halitosis, periodontal parameters including plaque index (PI), gingival index (GI), bleeding on probing (BOP) and microbial measurements were obtained before bonding (T0), 1 week later (T1) and 5 weeks after bonding (T2) and were statistically analyzed by SPSS software. Repeated measurement analysis was used to evaluate the means difference of times. Bonferroni and independent samples-T tests were used to compare the groups’ means.

Results: Group SLBs showed significantly lower halitosis and BOP parameters in T2. Also, these values showed no significant differences among T1–T2 in Group SLBs. But there were statistically significant increases between all the time intervals in Group CBs. PI and GI values are statistically significant between groups and all the time intervals. But, no significant difference between the microbial colonization of the groups was found at any time point.

Conclusion: Bracket types seems to have an effect on halitosis and periodontal status. Thus, self-ligating brackets may be advised to prevent patients from halitosis and maintain good oral hygiene during orthodontic treatment.

Free Communication Session 27 | B343 | 29.08.2013 | 14:00–15:00

Theme: Dental Treatment and Restorative Dentistry: Esthetics

FC169
Evaluation of Maxillar Incisor Proportions in Turkish Population
Gökçe Meriç, Selim Günsoy, Simge Taşar,
Mutahhar Muhammed Ulusoy
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Introduction: In order to achieve excellent aesthetics several authors have presented guidelines regarding anterior aesthetics which include recommendations for the optimal anterior tooth proportions and tooth dimensions.

Objectives: To study the prevalence of golden standard of 75–80% concerning the width-to-height ratio of the upper central incisor and 62% concerning the tooth-to-tooth proportions of the widths of the maxillary central, lateral and canine teeth proportions in a selected group of Turkish population and to determine gender differences.

Materials and methods: Seventy participants in the age group of 18–26 from seven different geographic regions of Turkey (35 men and 35 women) were selected. Irreversible hydrocolloid impressions were taken from their maxillary dentition and poured in type V stone. Clinical crown dimensions were measured with a digital caliper. All measurements were performed by three times. The measurements were compared using intraclass correlation coefficient (ICC). The results of the measurements in different groups were investigated by independent-sample t-test at a 95% significance level using Number Cruncher Statistical System.

Results: Ideal golden ratios for the maxillary anterior teeth were not found in the Turkish population. The width-to-height ratio of upper central incisor was 86.09 ± 09.73. The ratios between the widths of central to lateral and lateral to canine were 67.14 ± 11.40 and 95.85 ± 14.93, respectively. There was no significant difference between men and women in the population concerning the width-to-height and tooth-to-tooth proportions.
showing fibrin coating on the following day (Schindler G: Laser assisted frenectomy in pediatric dentistry. Case report; 32–35).

Materials and methods: Ten healthy patients who were referred for upper labial frenectomies (from February to July 2912) were included in this study.

The clinical examinations and evaluations revealed the existence of medial diastemas due to persistent aberrant labial frenulums.

Numbness of the surgical field was obtained with either topical or infiltration anesthesia, depending on the frenulums' morphology and patients cooperation.

Er. YAG laser (FOTONA FIDELIS III) was engaged with non-contact hand piece and preset parameters. The patients were advised to avoid hot and sour beverages. The check-ups were made the following day.

Results: Topical anesthesia was used in cases with thin frenulums, while for the treatment of wide frenulums, small amounts of infiltrative anesthesia were sufficient, in accordance with patients’ compliance. Bleeding was scarce, so sutures weren’t necessary.

The postoperative period was uneventful, with fibrine coating visible the following day.

Conclusion: Er. YAG laser frenectomies are minimally invasive procedures followed by uneventful postoperative recovery and promoted healing.

FC172
The Use of the 5 Year Index by Dental Students for Assessing Dental Arch Relationships in Patients with Unilateral Cleft Lip and Palate

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Asuman Deniz Gumru Celikel1, Elif Fatma Erbay1
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Objective: The purpose of this study is to evaluate reproducibility and reliability of 5-year Index when used by a dental student and also to assess localization of fistula and cleft; arch form and congenitally absent teeth.

Materials and methods: Research material comprised of panoramic radiographs and study models of 24 unilateral primary and secondary cleft palate patients (eight girls and 16 boys, with mean age 5.8 years). The dental arch relationships of the patients were assessed using the 5-year index by a dental student and an orthodontist separately. Study models were categorized into five scores according to 5 year index. All study models were assessed two times by the dental student. Then the results of the student were compared to the results of the orthodontist.

Results and conclusions: High correlation between the first and second time scores of the cases given by the dental student shows that this index is reproducible. Five year index was proved to be reliable as the scores of the dental student and the orthodontist were similar. These results showed that 5 year index can be used successfully by dental students.

There were fistulas in the palate in 67% of the cases and in vestibular sulcus area in 33%. Fourteen of the cases (58%) had symmetrical arch form and 10 (42%) had an asymmetrical arch form.

Incidence of congenitally absent teeth was 75%. In 11 patients the missing tooth was lateral incisor. Four patients has missing premolar whereas in three patients both of them were missing.

FC173
Replacement of Missing Teeth on Adolescent Patients After Orthodontic Treatment

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Introduction: At the end of the orthodontic treatment in a adolescent patient with missing teeth, a temporary replacement may be necessary for several years, while waiting to reach the physical maturity.

Aim: The aim was to present a retainer which is a fixed space maintainer, low cost, hygienic, functional, aesthetic, it does not compromise the self confidence of the adolescent and it offers unlimited time of using.

Materials and methods: At the end of the orthodontic treatment the first molar bands has been used to fabricate a passive palatal/lingual bar like a lingual arch has done. After the identification of right color and shape of the replacement tooth it have been taken a impression with the passive palatal bar in the mouth. At the laboratory the replacement teeth have been attached to this passive palatal bar and the appliance have been cemented at the frs molars.

Results: In 8 years of using this kind of appliance during the function it has been provided a very good distribution of the mastication forces in all the dental arch without pressing at the implant site, the orthodontic treatment has been stabilized, the aesthetic has been achieved, the self confidence and the oral hygiene of the adolescent has not been compromised at all.

Conclusions: This appliance can be an excellent treatment to postpone definitive treatment. Once growth has been completed and the parents are financially ready then implant therapy can be initiated.

Keywords: replacement of missing teeth, orthodontic treatment, fixed space maintainer, the implant site.

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tion of diagnosis based on conventional radiography, semi-serial histopathologic and serial sections histopathologic examinations. The accuracy of radiographic and semi-serial histopathologic diagnosis was estimated using the serial sections histopathologic diagnosis as the standard.

**Methods:** Study included 42 frontal teeth surgically treated for first time and 46 surgically retreated teeth. The radiographic examination was performed before apicectomy. Biotic material was obtained with lesions curettage during apicectomy and submitted the routine semi-serial histopathologic examination. The same bi-optic material submitted the serial sections histopathologic examination.

**Results:** Show that at surgically retreated teeth, based on radiographic and semi-serial histopathologic examinations dominated granulomas with 45.7%, respectively 69.56%, while serial sections histopathologic examination resulted with cysts domination at 50.0%. At first time surgically treated teeth, radiographic and semi-serial histopathologic examinations show granulomas presence at 35.7%, respectively 76.2%, whereas serial sections histopathologic examination show cysts domination at 59.5%.

**Conclusion:** Study results confirmed that diagnosis based on conventional radiography, semi-serial histopathologic and serial sections histopathologic examination, show the significant difference at both groups of teeth (surgically retreated ands first time treated teeth). Therefore neither conventional radiography nor routine semi-serial sections histopathologic examination can not be considered as credible diagnostic method for differentiating radicular cysts from granulomas. So the standard procedure for accurate diagnosis of chronic periapical lesions should be considered the serial sections histopathologic examination.

**FC175**

**Immediate Implant Placement in Esthetic Zone for Class III Patient**

Rafaa Taher Swesi

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**Aim:** The most challenging area of modern implant dentistry remains the “esthetic zone” in the anterior maxilla and mandible. Certainly much literature exists for the immediate replacement of extracted teeth with implants for the advantages of maintenance of alveolar bone volume and avoiding future implant surgery.

**Case:** The current clinical case is a 35-year-old healthy female patient with a Class III malocclusion underwent extraction of four anterior maxillary teeth and had immediate implants. The extracted teeth were in cross bite and had Gr 3 mobility that could not be saved by neither periodontal nor orthodontic measures. Furthermore, replacing these teeth was very challenging that required careful consideration of the location of residual bone, soft tissue esthetics, and room for the implants and prosthesis for ideal esthetic and functional use of immediate implant placement. Moreover, in many studies, high survival rates with immediate implant placement have been reported compared to those placed in healed ridges.

**FC176**

**Impact of Local Vitamin D Application on Alveolar Bone Regeneration: A Pre-Clinical Study**

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**Division of Oral Surgery, Bernhard Gottlieb Dental University, Medical University Vienna, Austria**

**Background:** Vitamin D deficiency is associated with a diminished capacity of bone to regenerate. As osseointegration requires bone regeneration to occur, oral implantologists must face the situation of vitamin D deficiency in their elderly patients. Recent pre-clinical studies indicate an impact of vitamin D deficiency on osseointegration, which may be reversed by systemic vitamin D administration. Yet raising vitamin D serum levels before oral surgery may take months. Local application of the active vitamin D metabolite has shown a beneficial impact on bone.

**Aim of the study:** Thus, it becomes important to know the effect of local vitamin D application on alveolar bone regeneration.

**Materials and methods:** To test this hypothesis, 60 adult male rats were divided into three groups. The vitamin depletion groups were fed a vitamin D free diet for 4 weeks. The control group was fed the standard diet for 4 weeks. After 4 weeks of housing two standardized defects were created in the diastema of the maxilla and mandible. In the vitamin D+ group (n = 20) Lyostypt soaked in calcitriol was placed, in the vitamin D- group (n = 20) and control group (n = 20) Lyostypt with soluble was placed. Sacrification took place after 1 and 3 weeks. Serum levels of 25-hydroxyvitamin D and parathyroid hormone were determined at the time of sacrifice. Histologic, histomorphometric analysis and micro CTs were performed to determine the static parameters of osseointegration.

**Hypothesis:** We hypothesize that vitamin D has a positive impact on alveolar bone regeneration in a vitamin D insufficient rat model.

**FC177**

**Documentation of WHO Surgical Safety Checklist in Oral Surgery**

Gezala Umar, Sarah Taylor, Ming Wei Tang

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**Background:** In 2008 the World Health Organisation launched the Surgical Safety Checklist (SSC) in line with “Safe Surgery Saves Lives” challenge to reduce surgical deaths worldwide. Structured checklists enhance the quality and safety of surgical patient care. In 2009 NHS trusts in England and Wales were advised to utilize an appropriately adapted SSC for each patient undergoing a surgical procedure by the National Patient Safety Agency. The SSC was piloted in the Oral Surgery department, modified accordingly and incorporated into the Oral Surgery Operative Sheet.
Aim: To measure the compliance of surgeons in Oral Surgery in completing the SSC.

Standards: The standard was set to 100% completion due to its importance in patient safety.

Method: The sample size required for an accurate representation was determined using a sample size calculator. Patient notes were inspected over several cycles for completed data entry.

Results: Correct documentation of the SSC was as follows:

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Percentage Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>71.8</td>
</tr>
<tr>
<td>2</td>
<td>73.7</td>
</tr>
<tr>
<td>3</td>
<td>76.3</td>
</tr>
<tr>
<td>4</td>
<td>53.5</td>
</tr>
<tr>
<td>5</td>
<td>70.5</td>
</tr>
</tbody>
</table>

Changes implemented:
1. Several emails were sent to staff, highlighting the importance of record keeping, as well as compliance with the SSC.
2. Results from the audit were presented to the department emphasizing the importance of SSC and improving compliance.
3. Staff who repeatedly fail to complete the SSC were individually addressed and encouraged to comply.

Conclusions: Compliance had steadily improved but then decreased dramatically when there was a lapse in the regular reminders sent to staff. Since individual training, the compliance has improved radically, although falling short of the standards set.

FC178

Dry Socket Incidence After Third Molar Extraction Using Chlorhexidine Gel 1%
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Aim: Aim of this prospective study was to compare the pain course, presence or absence of clot and bone exposure, as main symptoms of dry socket, after surgical extraction of third molar, using chlorhexidine gel 1% in alveola post extracted tooth.

Materials and methods: The sample consisted of 25 patients with bilaterally impacted lower third molars indicated for extraction. Importance of this paper consisted on, that the same subject belongs to a control group and a study group. Randomly in one side the extraction of third molar was done without using any of preparates while after extraction of lower third molar in the other side 2 weeks later, was used chlorhexidine gel 1% implicated directly in the alveola post extracted tooth. Pain intensity was assessed by means of VAS (0–100) on first, third and seventh day after surgery. Also the objective measurements was used to assessed the presence of clot in alveola and the bone exposure.

Results: Incidence of dry socket was 12% in cases without using chlorhexidine gel 1% after tooth extraction, wich is statistically significant.

Conclusion: Reduce of dry socket after surgical third molar extraction and the simplicity of using the chlorhexidine gel 1% justifies its use in oral surgery.

Free Communication Session 29 | B332 | 29.08.2013 | 15:30–16:30

Theme: Dental Treatment and Restorative Dentistry: Periodontics

FC179

Antimicrobial Activities of Essential Oil of Nigella sativa Against Periodontal Diseased
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Aim or purpose: To assess the in vitro antimicrobial activities of essential oil of Nigella sativa on some common and pathogens strains from the oral cavity of 26 peoples two sex, aged from 35 ± 4 divided in two group: healthy (n = 07) and with periodontal disease (n = 09).

Materials and methods: The effect of essential oil extract of Nigella sativa against oral microflora strains isolated from the oral cavity of healthy people and with periodontal disease using both agar disc diffusion and microdilution method. The protocol was approved by the Local Ethical Comity of the University. Analysis of variance (ANOVA) (Fisher’s test) was used for statistical analysis. A p-value of 0.05 was considered as a significant difference.

Results: A significant difference in colonization levels between the two groups was recorded. Six genera (Staphylococcus, Streptococcus, Escherichia, Enterobacter, Pseudomonas and Lactobacillus) and Candida albicans were commonly identified in all subjects at different colonization levels. Five pathogens genera (Acinetobacter, Streptococcus group D, Bacteroides and Porphyromonas – Prevotella) were isolated only in periodontal disease group. Nigella sativa extract essential oil more significantly inhibited the growth of pathogen bacteria from the dental plaque of periodontal disease.

Conclusions: Nigella sativa extract essential oil displayed a strong in vitro, antimicrobial effect on the oral cavity of healthy and patient’s periodontal disease.

FC180

The Influence of CD4+ T Cell Counts on HIV-Associated Periodontal Disease
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Aim: To determine whether CD4+ T cell counts, age or oral hygiene methods practiced by HIV positive patients has a greater impact in causing chronic inflammatory periodontal disease.
Materials and methods: A cohort descriptive study was conducted involving 120 male and female HIV positive patients irrespective of their antiretroviral therapy, attending the infectious diseases clinic at Tygerberg Medical Hospital, South Africa. Ethical clearance was obtained from University of the Western Cape. Periodontal clinical measurements such as plaque index, gingival index, probing depth and clinical attachment level were taken at the mesial aspect of six Ramfjord teeth using Williams periodontal probe. The mean age of the study population was 33.3 years with a median of 32 years. Significant positive correlation was found between age and plaque index ($p = 0.0018$). Significant positive correlations were found between CD4+ T cell counts with probing depth ($p = 0.0434$) and clinical attachment level ($p = 0.0268$) (Spearman’s correlation). When CD4+ T cell counts relative to brushing frequency and use of interdental aids were evaluated, statistically significant associations were found with p-values of 0.0190 and 0.0170 respectively (Wilcoxon rank sum test). No correlation was found between CD4+ T cell count and the age of the individuals (Spearman’s $r = 0.16452$, $p = 0.0726$).

Results: Statistically significant association was observed between CD4+ T cell counts and clinical indices. Statistically significant association was observed between CD4+ T cell counts and oral hygiene practices rather than the age groups.

Conclusion: The immnosuppression along with oral hygiene and plaque control characteristically influences the progression of periodontal disease in HIV positive patients.

FC181
Impact of Scaling and Root Planing on Red Complex Periodontopathogens in Generalized Aggressive Periodontitis Çağdem Paşalı1, Alpdoğan Kantarcı1, Gültnur Emingil1
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Objective: The aim of the present study was to investigate the clinical and microbiobiologic efficacy of scaling and root planing (SRP) in the management of generalized aggressive periodontitis (GAgP).

Methods: Sixteen patients diagnosed with GAgP and 14 healthy subjects were included. GAgP patients received scaling and root planing. Probing depth (PD), clinical attachment level (CAL), presence of bleeding on probing (BOP) and plaque index (PI) scores were recorded at baseline and at 1, 3 and 6 months after SRP. Red complex bacteria were analyzed at baseline, at 3 and 6 months after treatment by DNA-DNA checkerboard method. Parametric tests including repeated measures ANOVA and one-way post hoc analysis were used to test significance of changes.

Results: Statistically significant improvements were observed in clinical parameters of GAgP patients ($p < 0.05$). *P. gingivalis* levels were significantly reduced at 3 months compared to baseline while *T. forsythia* and *T. denticola* levels remained the same. All bacteria levels were significantly reduced at 6 months compared to the baseline ($p < 0.05$). *P. gingivalis* and *T. denticola* reached the levels of the healthy subjects at 6 months while *T. forsythia* levels were still significantly higher than the healthy subjects ($p < 0.05$).

Conclusion: While successful in reducing the levels of *P. gingivalis* and *T. denticola* in the subgingival plaque samples of GAgP, SRP was not effective on *T. forsythia* suggesting the use of adjunctive therapeutics to the mechanical treatment.

FC182
Subantimicrobial-Dose Doxycycline as Adjunctive Treatment for Periodontitis in Diabetics Marwa Abdelhakim Gomaa1, Hoda Mohamed El Guindy2, Mohamed Abdallah Mahmoud2, Enas Arafa El Zamrany3
1Dental Department, Benha University Hospital, Benha University, Benha, Egypt, 2Oral Medicine, Periodontology, Oral Diagnosis and Oral Radiology Department, Faculty of Dentistry, Tanta University, Tanta, Egypt, 3Clinical Pathology Department, Faculty of Medicine, Tanta University, Tanta, Egypt

Aim: To evaluate the effectiveness of adjunctive combination therapy of subantimicrobial-dose doxycycline (SDD) and locally delivered doxycycline (LD) in the treatment of chronic periodontitis in patients with type 2 diabetes mellitus (T2DM).

Materials and methods: Forty patients with a controlled T2DM and moderate chronic periodontitis were selected. They were randomly divided into four groups, ten patients each: Group (1) patients treated by full mouth scaling and root planing (SRP), LD gel 10% and SDD 20 mg bid for 6 months. Group (2) patients treated by full mouth SRP and LD gel 10%. Group (3) patients treated by full mouth SRP and SDD 20 mg bid for 6 months. Group (4) patients treated by full mouth SRP as a control group. Periodontal pocket depth (PPD), clinical attachment level (CAL), and bleeding on probing (BOP) were recorded at baseline, 3, 6 and 9 months. Gingival crevicular fluid (GCF) samples were collected and a quantitative measurement of matrix metalloproteinase-8 (MMP-8) was carried out by using Enzyme-Linked Immunosorbert Assay (ELIZA) at baseline, 3, 6 and 9 months.

Results: Significant reductions in clinical parameters (PPD, CAL, BOP), the amount of GCF MMP-8, were demonstrated at 3, 6, and 9 months evaluation period compared to the baseline for all study groups, with a significantly greater improvement for group (1) compared to other study groups.

Conclusion: Combination therapy including SRP, SDD, and LD, provided significantly greater clinical benefits than SRP alone in the treatment of chronic periodontitis in patients with T2DM.

FC183
Treatment of Periodontal Infrabony Defects with Demineralised Freeze Dried Bone Allograft Alone or in Combination with Platelet Rich Fibrin Arundeep Kaur Lamba
Department of Periodontics, Maulana Azad Institute of Dental Sciences, New Delhi, India

Aim or purpose: Aim of the present randomized, double-masked, split mouth clinical trial was to compare clinical and radiographic outcomes obtained with the combination of platelet rich fibrin and
decalcified freeze dried bone allograft (PRF + DFDBA) to those obtained with DFDBA alone in infrabony periodontal defects. **Materials and methods:** Twelve patients with chronic periodontitis and displaying bilateral infrabony defects with probing depth of ≥5 mm were treated with PRF + DFDBA on one side and DFDBA alone on the other side. The following clinical and radiographic parameters were evaluated at baseline and at 6 months after treatment: plaque index (PI), gingival index (GI), probing depth (PD), clinical attachment level (CAL), and bone fill (BF). The primary outcome variable was CAL. **Results:** No statistically significant differences in any of the studied parameters were observed between the two groups at 6-month reevaluation. Healing was uneventful in all patients. Six months after therapy, the sites treated with PRF + DFDBA showed a reduction in mean PD from 8.50 ± 2.34 to 3.25 ± 1.06 mm and a change in mean CAL from 9.50 ± 2.714 to 4.42 ± 1.44 mm. In the group treated with DFDBA, mean PD was reduced from 8.17 ± 1.949 to 4.25 ± 0.754 mm, and the mean CAL changed from 8.92 ± 1.730 to 5.50 ± 0.90 mm. The mean bone fill for test site was 2.45 ± 1.31 mm and for control site it was 1.32 ± 0.70 mm. **Conclusion:** Within its limits, the present study has shown that, at 6 months after regenerative therapy in periodontal infrabony defects, optimal clinical results were obtained with DFDBA with or without the addition of PRF.

**Free Communication Session 30 | B342 | 29.08.2013 | 15:30–16:30**

**Theme: Implantology: Oral Surgery**

**FC184**

**Effect of Menstrual Cycle on Frequency of Alveolar Osteitis in Women Undergoing Surgical Removal of Mandibular Third Molars: a Single-Blind Randomized Clinical Trial**

Majid Eshghpour1, Nasir Mohammadzadeh Rezaei2, Amirhossein Nejat3

1Department of Oral and Maxillofacial Surgery, Mashhad University of Medical Sciences, Mashhad, Iran, 2General Dentist, Mashhad, Iran, 3Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran

**Purpose:** To measure the association between the menstrual cycle and the frequency of alveolar osteitis (AO).

**Methods:** In a single-blind study, patients with bilateral impacted third molar teeth underwent randomized surgical extraction: one tooth during the menstruation period and the other in the middle of the cycle. Ethical Committee of Mashhad University of Medical Sciences approved the study protocol. The predictor variable was timing of the menstrual cycle (grouped as mid-cycle and menstruation period) and the outcome variable was AO. Other study variables included birth control pill (BCP) use, smoking status, irrigation during surgery, extraction difficulty, surgeon experience, number of local anesthetic(s) used, and age. Appropriate bi- and multivariate statistics were computed and the level of statistical significance was set at p-value < 0.05.

**Results:** A total of 145 patients, with a mean age of 24 years old, underwent 290 surgeries. The overall frequency of AO was 23.45%. The frequency of AO was significantly higher in the middle of the cycle compared to during the menstruation period in both BCP takers and non-takers (p-value < 0.05). Although BCP takers revealed a significantly higher frequency of AO in comparison to non-takers (p-value < 0.05), there were no statistically significant differences between the two groups during the menstruation period (p-value > 0.05).

**Conclusion:** Menstrual cycle could be a determinant risk factor in the frequency of AO. It is recommended that elective surgeries be performed during menstruation period (regardless of BCP-taking status) to eliminate effect of cycle-related hormonal changes on development of AO.

**FC185**

**How Much Should the Dentist Know About Medical Conditions?**

Awad Omran Ashekhi
Al-Zabra Hospitals

**Introduction:** This is clinical cases presentation, which will show how important it is for the dentist to know about the relation and the connection between dental and medical diseases.

**Conclusions:** The dentist must have enough solid medical knowledge to treat his patient safely and to avoid any serious problems or complications, which may be caused by lack of medical knowledge and procedure.

**Theme: Implantology: Implantology**

**FC186**

**Cell- and Gene-Expression in Peri-Implant Soft Tissue During Dental Implant Healing**

Stefan Schultze Mosgau, Stefanie Prinz
Department of Oral and Maxillofacial Surgery, University Hospital of Jena, Germany

**Objectives:** This study aimed at elucidating the influence of implant shoulder design and insertion protocol on peri-implant soft tissue healing.

**Materials and methods:** In 12 mini-pigs four dental implants were installed in each quadrant. According to the shoulder design of the implants pigs were assigned to three treatment groups: 1: rough, 0.4 mm shoulder; 2: smooth, 3 mm shoulder and 3: smooth, 0.4 mm shoulder. One quadrant was randomized to flapless insertion, while the other was chosen for conventional flap surgery in each animal. Biopsies were retrieved from the healing area 1, 2, 4, 12 weeks post surgery, analyzed for the expression of integrin α6β4 chain β4 and laminin5γ2, marker molecules of the implanto-epithelial junction. Samples were subjected to standard histology, leukocyte count, pangenomic gene expression analysis.

**Results:** Following exposure of the alveolar crest by the punch technique a significantly higher expression of ITGB4 was found at 4 weeks (p = 0.009), 4 (p = 0.001) as well as 12 week (p = 0.005) follow up. Furthermore, the expression of LAMC2 was significantly higher following punch exposure after 1 (p = 0.033), 2 weeks.
(p = 0.041), 3 (p = 0.004) as well as 12 weeks (p = 0.002) of transmucosal implant healing. A significant difference in leukocyte influx was detectable between flapless and flapsurgery. The microarray indicated reduced proliferation in flap surgery. Reduced inflammation was detectable for the implants with smooth, 0.4 mm shoulders.

**Conclusions:** Flapless surgery induces less inflammation and results in enhanced cellular proliferation and migration as compared with flap surgery. Regarding design the smooth, 0.4 mm shoulder should be preferred. Flapless placement improved the formation of a sufficient implanto-epithelial junction.

**Theme:** Dental Treatment and Restorative Dentistry: Esthetics

**FC187**
Placement and Replacement of Restorations in General Dental Practice

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**Aim:** To study the restorative pattern in Icelandic general dental practice, the selection of restorative materials, the reason for placing restorations and compare it to reported results in 1983 and 2000.

**Materials and methods:** One hundred and ninety general dentists were invited to participate. They were asked to register patient’s gender and age, clinician’s gender and years in practice and information for placement and replacement of 100 restorations. Statistical significance was calculated in SPSS using chi-square analysis. The study was approved by The National Bioethics Committee.

**Results:** Ninety seven dentists (51.1%), 59 males and 38 females, registered information on 9.647 restorations, 48.9% in male and 51.1% in female patients with average age of the patients 36.5 years. 85.2% were composite restorations, 7.1% amalgams, 4.4% glass ionomers, 3.3% other materials and composite was the predominant material used for Class I (89.7%) and Class II (83.7%) while amalgam was used 3.3% in Class I and 10.6% in Class II and the use of amalgam was significantly more frequent (p < 0.001) in males (9.2%) than females (6.2%), but not in the use of composite (93.8% in female, 90.8 in male). Of primary restorations 82.1% were placed due to primary caries, 15.3% non-carious defects and for replacements which comprised 30.3% of all restorations, secondary caries was the main reason (45.6%), followed by marginal and bulk fractures (28.8%).

**Conclusions:** Composite is the most common restorative material used and primary and secondary caries is still the main reason for placing restorations as in 1983 and 2000.

**FC188**
Screening and Identifying Tooth Shade in Group of Sudanese Patients

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**Objectives:** The aim of the present investigation is to identify tooth shade and to correlate Classical tooth shade to age, gender and state of origin.

**Methods:** This observational descriptive cross-sectional study was conducted on patients attending the Faculty of Dentistry clinics at university of Khartoum. Total number of patients was 227. Participant’s age, ranged from 15 to 72 years which, was divided into four groups. The tooth included in the study was either right or left sound maxillary central incisors. Vita Easyshade (Vident, Brea, CA, USA) was used to select the tooth shade. Investigation of the differences of CIELab coordinates among gender and state of origin was conducted together with examination of the relationship between CIELab coordinates and age. One-Way Analysis of Variance was used to test the differences in L*, a* and b* according to state of origin. All tests significance level was taken at level of p-value ≤ 0.05.

**Results:** Results showed that A3, A2 and A1 were the most common classical tooth shade respectively. There was highly significant difference in L* between males and females (p-value = 0.002). There was a significant relation between tooth shade and age (p = 0.026). There was a high significant association between Classical Tooth Shade and Sudan regions (p = 0.00).

**Conclusions:** In conclusion, most common classical shade was A3, women’s teeth were lighter than men’s. There was relation between ethnic background and tooth shade.

**Keywords:** Tooth shade, Aesthetics, CIELab.

**Free Communication Session 31 | B343 | 29.08.2013 | 15:30–16:30**

**Theme:** Dental Treatment and Restorative Dentistry: Prosthetics

**FC189**
The Effect of Liquid Polishing Materials on Stainability of Provisional Material

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**Purpose:** The purpose of this study was to investigate the effect of liquid polishing materials on color stability of bis-acryl provisional material.

**Materials and methods:** Two liquid polishing materials, Biscover LV and G-Coat Plus, and one auto-cure bisacryl provisional material Acrytemp were tested. Ninety specimens (10 × 2 mm) were divided into three groups including, Group A, the control group with no liquid polishing material applied and groups B and C, the liquid polishing materials G-Coat Plus and BisCover LV were applied. The specimens were then divided into three subgroups (n = 10) and stored for 24 h at 37°C in different staining solutions: coffee, coffee with sugar and cola. Color of specimens was measured at baseline and after immersion with a spectrophotometer using CIE L*a*b* system, and color changes (ΔE) were calculated.

**Results:** The means of color change for each specimen were analyzed using a one-way ANOVA test and Bonferroni post-hoc comparison. Liquid polishing material was the most significant factor
for color change (F-value = 679.89), followed by the staining agent (F-value = 346.34). The application of liquid polishing materials significantly decreased staining of auto-cure bis-acryl provisional material where the difference between G-Coat Plus and BisCover LV was statistically insignificant (p < 0.01). When comparing the three staining solutions, coffee with sugar demonstrated higher AE values than coffee without sugar and cola respectively.

**Conclusion:** The use of liquid polishing materials significantly decreased staining when compared to bis-acryl specimens without liquid polish.

**FC190**

**Comparison of Aging and Repair Methods on Composite-Zirconia Bonding**

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**Purpose:** Intraoral repair of chipped veneering porcelain provides an option when the restoration cannot be removed and replaced. This in vitro study investigated the shear bond strength (SBS) of two porcelain repair methods to the zirconia ceramic after different aging methods.

**Materials and methods:** One hundred and twenty zirconia discs (InCeram Zirconia) were embedded in an acrylic resin base and polished under water-cooling. Sixty specimens received airborne-particle abrasion with 110 μm Al₂O₃. Sixty specimens had no airborne-particle abrasion. Each group was divided into two subgroups (n = 30). Two repair methods were applied to the subgroups. The first method was using a porcelain repair kit (Bisco), and the second method was using a silane (Single Bond Universal Adhesive) and a composite resin (Z100). Subgroups of ten specimens each, were stored in 37°C water for 1 week, or exposed to thermal or mechanical cycling. SBS tests were performed in a universal a testing machine. Three-way ANOVA was used to analyze the data. The Tukey HSD test was performed for multiple comparisons (α = 0.05).

**Results:** The SBS between zirconia disc and repair composite was affected by repair and aging methods (p < 0.05). Among the groups, mechanically cycled, conventionally repaired group with no surface conditioning had the highest bond strength with a value of 29.8 MPa, while water-stored, repair kit group with no surface conditioning showed the lowest bond strength with a value of 7.84 MPa.

**Conclusions:** Thermocycling had a significantly negative effect on bond strength compared to storing in water or mechanical cycling. Surface conditioning is recommended when using repair kit.

**FC191**

**Effects of Boron on the Cytotoxicity and Antiseptic Properties of PMMA**

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**Objectives:** The objective of this study was to determine whether the addition of different types of boron (Colemanite, Borax, Boric Acid) to polymethylmethacrylate denture base resin (PMMA) would reduce bacterial and fungal adhesion on the surface of PMMA.

**Materials and methods:** Different types of boron were added to heat-cured PMMA in different ratios (1%, 2%, and 3%). Two hundred PMMA specimens were prepared for cytotoxicity test (5 × 1 mm) and assessment of bacterial and fungal growth (26 × 2 mm) according to the manufacturers’ instructions (n = 10). Specimens were sterilized with ethylene oxide gas and then placed on to the L929 fibroblast cell culture. According to the 1999 ISO 10993-5 protocols, cytotoxicity were determined by means of agar overlay test. In addition, antiseptic properties were assayed against ten reference strains (Neisseria sicca, Streptococcus mutans, Klebsiella pneumonia, Bacillus subtilis, Streptococcus pyogenes) and three laboratory strains (Candida albicans, Lactobacillus acidophilus, Candida tropicalis) standardized suspension.

**Results:** There was no cytotoxic effect in all Colemanite and boracic acid groups. However, 2% and 3% Borax specimens revealed cytotoxic effects (mildly and moderately, respectively). Furthermore, there was significant difference in the number of bacterial and fungal colonies in all Colemanite groups. After 36 h, both Colemanite and Boracic acid groups presented a statistically significant difference in the reduction of the number of bacterial and fungal colonies.

**Conclusion:** The addition of Colemanite and Boric acid to PMMA inhibited both bacterial and fungal growth on the surface of PMMA. It also proved that it did not alter cytotoxicity of the PMMA.

**FC192**

**Compatibility of Hard Chairside Reline Resins and Denture Cleansers: Influence on Surface Roughness**

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**Statement of problem:** Immersion in chemical solutions has been the most recommended method for denture disinfection. However, the effect of this method on the surface roughness of hard chairside reline resins has not been thoroughly investigated.

**Purpose:** The purpose of this study was to evaluate the effect of chemical disinfection on the surface roughness (Ra, μm) of two hard chairside reline resins (Ufigel Hard, New Truliner) and one heat polymerizing denture base resin (Meliodent).
Materials and methods: Specimens (10 x 2 mm) were divided into one control and four test groups (n = 10). Surface roughness measurements were performed before and after immersion in distilled water and four prepared different denture cleanser solutions 8 h for 14 days. Measurements (Ra, μm) were analyzed using Kruskal–Wallis and Wilcoxon Signed Ranks test (p < 0.05).

Results: Immersion in chemical solutions significantly increased the surface roughness of Ufigel Hard and Meliodent, regardless of the denture cleanser used. For New Truliner, an increase in roughness was observed whereas effect of immersion in sodium perborate solutions was significantly higher when compared to acid type cleanser and distilled water.

Conclusions: Immersion in chemical solutions did affect the surface roughness of all materials evaluated. For New Truliner, the effect of denture cleansers on the surface roughness varied among materials.

Clinical implications: This study suggests that immersion in denture cleanser solutions affect the surface roughness of denture base and hard chairside reline resins. However, the effect of different cleansers on surface roughness may be variable.
Materials and methods: A total of 59 samples of upper first premolar had been collected from randomly selected dental clinics in Klang Valley. Each tooth was cleaned and measured for tooth length and mesiodistal width dimension with a digital caliper. Number of roots, furcation area and inclination of the roots were observed. Results: This study found that the mean length for one-rooted was 21.12 mm (SD ± 1.66), for teeth that has two rooted, the mean length was 20.92 mm (SD ± 1.86) for buccal root and 20.41 mm (SD ± 1.72) for palatal root. For three rooted, mesiobuccal root length was 19.77 mm (SD ± 3.35), distobuccal length was 19.92 mm (SD ± 1.67), and palatal length was 20.69 mm (SD ± 1.13). The study showed that the number of teeth that has one root were 61%; 35.6% were two rooted, and 3.4% were three rooted. The mean mesiodistal width was 7.59 mm (SD ± 0.39). The furcation area were observed to be located at coronal third (3.4%), middle third (10.2%), apical third (25.4%). The root inclination was observed as no inclination (25.4%), inclination towards mesial (8.5%), inclination towards distal (62.7%). There is a negative correlation (\( p > 0.05 \)) of tooth length, number of root, mesiodistal width, furcation area, root inclination between races. Conclusion: Morphometric of upper first premolar are variable. However there is no statistical significant relationship of morphometric of upper first premolar between races in this study.

New Root Canal Sealer Based on Calcium Silicate – Chitosan
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Objective: The aim of this study was to develop new root canal sealer and test it in vitro for leakage and solubility studies.

Method: Calcium silicate had been prepared from different traces of pure powders of different constituents and 2% of chitosan powder was added to the final preparation to be mixed with distilled water. ADA specification for root canal sealer was applied to this preparation and it was passed the requirements. Thirty extracted human adult straight single-canaled palatal separated roots of maxillary 1st molar teeth were collected. The length of the teeth was measured using digital vernier caliper from the tip to the apex of the roots. The roots were instrumented and obturated with either thermoflail gutta-percha with AH plus sealer (15 in no.) or with experimental material (15 in no.). Bacterial micro-leakage using two chambers model was executed later on. Solubility test was done using ADA specification standardized models with 15 specimens in no. for the experimental material for 24 h, 3 and 7 days.

Result: The experimental material had higher mean values over the control material that the root canal contaminated within 17 days. However, there was non-significant difference between these materials at \( p = 0.462 \). The experimental material had solubility percentage values within 2% of the original set material and this comply with the ADA specifications.

Conclusion: A new root canal sealer material was prepared and passed the ADA specifications. Bacterial micro-leakage and solubility studies revealed that the experimental material had comparable results with the control material.
divided into three groups, depending on the mode of additional disinfection: I-group – PDT with Fotosan; II-group – Nd:YAG laser; III-group – 2.5% NaOCl and 17% EDTA. The teeth are filled with gutta-percha and AH26 sealer by warm condensation. After that the teeth are isolated with nail varnish, leaving free apical 5 mm. To establish a hermetic obturation of the root canals, teeth are cut longitudinally with a microtome and observed under a microscope.

**Results:** Microleakage was observed in all studied groups. Least leakage was at group no. I and III, and the most leakage in a group no. II.

**Conclusion:** The application of PDT with Fotosan does not lead to increase in root canal microleakage and can be safely used in endodontic treatment. After application of Nd:YAG laser is appropriate to rinse the root canal with a solution of 17% EDTA to elimination the smear layer.

**POSTERS SESSION 02 (P210–P418)**

**Theme:** Dental Treatment & Restorative Dentistry: Caries

**P210**

**The Prevalence of White Spot Lesions After Using Glassionomer Cement and Composite in Fixed Orthodontic Appliances**

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**Aim:** The aim of the study was to evaluate the white spot lesions prevalence after using glassionomer cement (GIC) and luting composite (CR) for bonding brackets and bands of fixed orthodontic appliances.

**Material and method:** Sample size was 38 patients age group 12–18 years old. The patients were treated in an orthodontic specialized clinic. The patients received full brackets therapy.

Written permission was received by parents.

The total of examined surfaces was 912. In 22 patients brackets and bands were bonded with glassionomer cement, total of surfaces bonded with GIC n = 528.

In 18 patients brackets and bands were bonded with composite, total of surfaces n = 384. There was no professional fluoridation treatment planned for both groups. The final examination was done after 24 months.

**Results:** At baseline the prevalence of white spot lesions was 7.9% (n = 72) for the 38 patients.

At debonding after 24 months, the prevalence of white spot lesions of the surfaces bonded with GIC was 17.6% (n = 93) significantly lower than 30.7% bonded with CR (p ≤ 0.05).

No difference regarding gender was observed.

**Statistical analyses:** The discrete variables were presented in absolute number and percentages. Chi-square test was used to analyse the differences between proportions. The statistical analyses was performed using SPSS 19.0. A p-value ≤ 5% was considered significant.

**Conclusion:** The presence of white spot lesions is more frequent in surfaces bonded with CR compared with surfaces bonded with GIC.

**P211**

**Nd: Yag Laser in the Therapy of Hypersensitivity Teeth: Clinical Evaluation**

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**Aim:** The aim of this study was to evaluate the clinical effectiveness of Nd: YAG laser in the therapy of hypersensitive teeth.

**Material and methods:** The study consisted 43 individuals of both sexes at the age 26–54. Out of all 58 teeth with diagnosis of hypersensitivity – 48 teeth were at the teeth necks and 10 of them at the occlusal surface. Nd:YAG laser irradiation was used with adequate treatment protocol in three visits depending of the subjective symptomatology. Laser irradiation was applied on the teeth’s gingival third with the fiber optic hand piece. The distance between the fiber and the target tissue was 1.5 mm, the whole neck surface of the teeth was exposed with slow motions in a period of 60 s and the procedure was repeated three times per session.

**Results:** The results of this clinical evaluation showed that Nd: YAG laser has a significant and quicker clinical effect in reducing the dentine hypersensitivity. The rate of success was 100% after the first session at the patients with occlusal surface hypersensitivity. Most of the patients had second visit to respect the appointment, not for second session of the therapy. Necessity for a third laser irradiation was found in only three cases.

**Conclusions:** The Nd: YAG laser is a suitable tool for immediate successful reduction of dentinal hypersensitivity and has better patient satisfaction, shorter treatment-time, and lower rates of pain. Positive clinical effects recommended laser as a new technology in everyday clinical practice.

**P212**

**Clinical Performans of Atraumatic Restorative Treatment: Clinical Follow-Up and SEM Study**

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**Aim:** The purpose of this in vivo and in vitro study was to investigate the clinical performance of atraumatic restorative treatment (ART) on the molar tooth of the adults according to the modified criteria of United States Public Health Servise (USPHS) by clinical examination of the teeth and scanning electron microscopy (SEM) on the replicas of the restored teeth.

**Materials and methods:** Nineteen to 35 years old 25 volunteers at high caries risk were involved in the study (Approved by the ethics committee of Istanbul University on the 23/05/2007 with Protocol Number 2007/808). ART were performed under the field
Antimicrobial Efficiency of Photodynamic Therapy with Different Irradiation Durations

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Aim: Photodynamic therapy (PDT) has been introduced as an alternative disinfection method in order to overcome the limitations and potential complications of conventional root canal disinfection methods. This study aims to evaluate the antimicrobial efficiency of PDT and the effect of different irradiation durations on the antimicrobial efficiency of PDT.

Materials and methods: Sixty freshly extracted human teeth with single root were decoronated and distributed into five groups. Root canals were instrumented and irrigated with sodium hypochlorite, ethylenediamine-tetraacetic acid and saline solution during instrumentation and then autoclaved. All of the roots were inoculated with Enterococcus faecalis suspension and brain heart infusion broth and stored for 21 days to allow biofilm formation. Control group received no treatment. Group 1 was treated with 5% NaOCl solution. Group 2, 3, and 4 were treated with methylene-blue photosensitizer and 660 nm diode laser irradiation for 1, 2 and 4 min in following order. Microbiological data about the load of microorganisms were collected before and after disinfection procedures and analyzed with Wilcoxon Signed Rank test. Statistical significance was evaluated at the p < 0.05.

Results: At the end of sixth month, marginal adaptation of ART restorations exhibited a poor performance compared with that of the baseline (p < 0.01); however, there were no totally or partially loss of restorations, caries development, postoperative sensitivity and pulps (p > 0.05). SEM examination also showed an 8.9% increase in the frequency of marginal gaps (p < 0.01).

Conclusion: ART is a reliable method in dental clinic over a 6 month period.

Theme: Dental Treatment & Restorative Dentistry: Endodontics

Conclusions: PDT is as effective as conventional 5% NaOCl irrigation with regard to antimicrobial efficiency against Enterococcus faecalis.
Linear regression equations were derived for predicting the age of the individuals separately for each gender.

**Results:** The pulp/牙 area ratio of lower premolar was seen to decrease significantly with age. Multiple regression equations were derived based on age as the dependent variable and the tooth/pulp ratios as predictors.

**Conclusion:** Thus, the pulp/牙 ratio is a valuable method in the estimation of age of subjects of Indian origin.

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**P216**

**Effects of Different Irrigating Solutions and Disinfection Methods on Push-Out Bond Strengths of Fiber Posts to Root Dentin**

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**Aim:** The aim of this study was to evaluate the effects of various irrigating solutions and photoactivated disinfection (PAD) on the push-out bond strengths of fiber posts to root dentin.

**Methods:** Thirty-two human teeth were divided into eight groups, as follows: (i) irrigation with physiologic saline (control), (ii) NaOCl irrigation, (iii) chlorhexidine (CHX) irrigation, (iv) ethanol (EtOH) irrigation, (v) NaOCI followed by 17% EDTA irrigation, (vi) NaOCl-EDTA supplemented with CHX irrigation, (vii) NaOCl-EDTA supplemented with EtOH irrigation, and (viii) NaOCl-EDTA irrigation supplemented with PAD. After the posts were cemented, the roots were transversely sectioned to obtain four slices (1 mm thick) (n = 16). Push-out tests were conducted by applying a load at 0.5 mm/min, type of fracture failures were recorded, and data were analyzed with one-way ANOVA and Turkey post hoc tests (p < 0.05).

**Results:** Push-out bond strength was significantly affected by the type of irrigating solution and the disinfection protocol (p < 0.05). The bond strength of the EtOH, NaOCI, and NaOCl-EDTA-CHX irrigated groups was significantly higher than that of the other groups. The highest bond strength was observed in the EtOH irrigated group, and the lowest was the NaOCl-EDTA irrigated group.

**Conclusions:** Irrigation with NaOCI and EDTA combined caused lower bond strength than observed in the control group. However, supplementing this combination with CHX improved the post-den- tin bond strengths; supplementing with PAD did not.

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**P217**

**Efficacy of Self-Adjusting File and Passive Ultrasonic Irrigation on Removing Calcium Hydroxide from the Root Canals**

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**Aim:** The aim of this study was to evaluate the efficiencies of the self-adjusting file (SAF) system and passive ultrasonic irrigation (PUI) in the removal of calcium hydroxide (CH) from the root canals.

**Material and methods:** Thirty-six mandibular premolar teeth were used. Root canals were instrumented with the Revo-S rotary files. The canals were then filled with a premixed CH preparation. Specimens were randomly assigned to two experimental groups according to the CH removal technique: SAF system (n = 15) and PUI (n = 15). The remaining specimens served as positive (n = 3) and negative (n = 3) controls. The specimens were then evaluated with SEM analysis and scored. Data was analyzed with Kruskal–Wallis and Mann–Whitney U-tests.

**Results:** Residues of CH were found in all experimental groups. There was statistically significant differences in the results for removal of the CH among the groups (p < 0.05). Group 2 (PUI Group) was superior to the Group 1 (SAF Group) in all the thirds of the canal (p < 0.05). Intergroup differences in all the thirds of the canal were not statistically different in two experimental groups. Intergroup differences in all the thirds of the canal were statistically different in two experimental groups (p < 0.05). Positive control teeth in all groups showed densely packed remnants in all thirds as opposed to the negative control.

**Conclusion:** According to the findings of this study, none of the techniques removed the CH completely. But, PUI technique was significantly more effective than SAF system.

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**P218**

**Healing of a Wide Periapical Lesion Using Calcium Hydroxide. A Follow Up Using CBCT**

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**Aim:** Calcium hydroxide [Ca(OH)2] is widely used as short- or long-term intracanal antibacterial dressing material during endodontic treatment. This case report demonstrates application of [Ca(OH)2] as a long-term medication in the canals of a posterior tooth with a wide periapical lesion.

**Case:** A 42 years old female patient history had referred to the Department of Endodontontology, Bezmialem University, Turkey. Her chief complaint was the continued pain in the right side of her maxilla, during the past 1 year. The patient indicated that her pain started after renewal of her maxiller first molar tooth filling. Root canal treatment was implemented according to her pain but the pain didn’t stop. The fourth canal was found while retreatment. When she came, four root canal fillings of the patient’s tooth had been removed and there were broken files in the mesiobuccal and palatal canals. A fistula had been occurred and there was pus coming from the canals. We applied [Ca(OH)2] in the canals for short and then long term.

**Conclusion:** Obturation has been done after we observed healing of the lesion. The stages of the treatment has been documented by using CBCT.
P219
The Necessity of Three Dimensional Imaging: A Case Report
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Aim: To present a clinical case of superposition of granulation tissue in the middle third level of root canal and role in the evaluation of endodontic treatment.

Summary: A 20 year old male was referred to the department with strong pain in the upper right lateral incisor. On the clinical examination; the tooth was found have caries and dens invaginatus and also have high vertical and horizontal percussion sensitivity. The patient was being treated orthodontic teraphy. On the radiological examination irregularity was determined in the root canal. Canal preparations were completed in the first appointment, and calcium hydroxide dressing were performed to root canals for 2 weeks. Then, the root canal was filled with AH Plus and gutta-percha. Root canal preparation and filling were repeated for three times because of irregularity in root canal taken radiography. After final canal filling decided to performing apical endodontic surgery because of the radiolucency at the middle third. At the surgical appointment buccal bone deffect and granulation tissue determined in the middle third level of root canal. The granulation tissue removed by using surgical curette carefully. There was no perforation or resorption on the root canal surface. The patient was called routine controls. After 2 years from treatments the tooth was healthy.

Conclusion: Superposition of the granulation tissue on the middle third level of root canal confused and made the clinician thought that there was a pathology in the root canal. In such cases the use of computerized tomography could be a good method.

P220
Treatment of Large Cyst-Like Periapical Lesion: A Case Report
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Aim: To present clinical results of nonsurgical root canal treatment of large cyst-like periapical lesion.

Case: A 45-year old female was referred to the our department with strong pain in the upper right lateral incisor and a feeling of swelling in the face of her. On the clinical examination; we determined light color change, old composite restorations on the tooth and a sinus on buccal gingiva. There was moderate vertical and horizontal percussion sensitivity. On the radiological examination inadequate root canal filling and wide periapical pathosis reaching middle third of root canal found. In the first appointment inadequate root canal filling was removed and in the second appointment root canal preparation was repeated. The root canal was dressed six times in 3 days apart because of pus flowing through the canal. For each season different root canal irrigants were used. Then calcium hydroxide dressing were performed to root canal. During the application a liquid crystalline began to flow by pressure. Therefore cavity didn’t sealed for a day. Calcium hydroxide dressing were performed to root canal three times intervals 2 weeks. When the root canal was dry root canal filling had been performed by using AH Plus root canal sealer and gutta-percha. Restoration of tooth were made with composite resin. The patient was called periodic controls. After 6 years from treatment the tooth was healthy and functional.

Conclusion: Large cyst-like periapical lesions can heal by using calcium hydroxide dressing without performing apical surgery.

P221
Clinical Management of an Infected Immature Tooth with Dens Invaginatus – A Case Report
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Aim: To present the regenerative endodontic treatment of a necrotic immature tooth with dens invaginatus and its 1-year follow.

Case: A 9-years-old female was referred to Acibadem Hospital with a complaint of pain on her maxillary right lateral incisor. She suffered from swelling associated with the tooth. A diagnosis of dens invaginatus (Oehler’s type III) with pulp necrosis and chronic apical periodontitis was established. CBCT was taken to see the three dimensional images of this complex endodontic condition.

With local anaesthesia, endodontic access was performed. A single canal orifice was revealed. The root canal was so thin and instrumented up to 25 h- files and irrigated with 2.5% sodium hypochlorite solution. Then the tooth was medicated with calcium hydroxide paste. In 3 weeks’ time, tooth was still symptomatic. Then tri-antibiotic paste (mixing of 250 mg ciprofloxacin, 250 mg of metronidazole and 250 mg Minocycline with sterile water) was applied into the canal. One month later tooth was asymptomatic. Regenerative process was initiated; removal of tri-antibiotic paste followed by stimulation of haemorrhage clot formation and MTA placement. At the same appointment final composite restoration was placed.

Results: The clinical examination in the 6th and 12th months showed no clinical signs of pathology. Radiographic examination revealed complete healing of periapical lesion but apex was not formed yet.

Conclusions: It is important that dentists recognize the potential of regenerative endodontics in the treatment of necrotic immature teeth.
P222

Push-Out Bond Strength of New Calcium Silicate Based Materials and MTA in Simulated Furcation Perforations
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Material and methods: In this study, freshly extracted single-rooted human 60 canine teeth were used. The crown of each tooth was sectioned at the cemento-enamel junction using a water-cooled diamond disk and the midroot dentin was sectioned horizontally into slices with a thickness of 1.0 mm by using a water-cooled IsoMet diamond saw. In each slice was made a perforation model, the existing canal space of the dentin slice was instrumented with Gates Gllidden burs no. 2 through no. 3 to a diameter of 1.3 mm. Then, the root sections were randomly divided into three groups (n = 20), and the following test materials were used: Group 1: Mineral trioxide aggregate (MTA, ProRoot; Dentsply Tulsa Dental, Tulsa, OK), Group 2: Endosequence root repair material putty (ERRMP, Brasseler USA, Savannah, GA), Group 3: Biodentine (Septodont, Saint-Maurdes Fosses, France) These test materials were inserted into the prepared root canal specimens by using an appropriate root canal condenser. Subsequently, the samples were wrapped in wet gauze, placed in an incubator, and allowed to set for 10 min. After incubation, the samples were immersed into 5 min 5.25% NaOCl. Then all samples were rinsed with distilled water and then allowed to set for 48 h at 37°C with 100% humidity in an incubator.

Results: Statistical Analysis indicated that the push-out bond strength values were significantly affected by between MTA and ERRMP, between MTA and Biodentine (p < 0.05). ERRMP and Biodentine which were significantly higher bond strength values were not established. Push-out bond strengths were significantly affected by between MTA and ERRMP and mta Based Sealers

P224

Effect of Moisture on Push-Out Bond Strength of Resin and mta Based Sealers
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Aim: The aim of this study was to evaluate the effect of moisture on push-out bond strength of two resin and mta based root canal sealers.

Material and methods: Thirty six mandibular premolars were used in this study. The crowns were removed and the root canals were prepared using ProTaper Rotary instruments. Smear layers were removed using passive ultrasonic technique. The root canals were randomly assigned to three experimental groups with respect to the moisture condition tested: (i) dehydration with 95% ethanol for 20 s and dried with four ProTaper paper points, (ii) dried with four ProTaper paper points, (iii) dried with only one ProTaper paper point. The root canals were further divided into four subgroups according to the sealers used and obturated with AH Plus, EndoRez, MTA Fillapex, iRoot SP. The specimens were transversally sectioned from coronal to apical. Push-out tests were performed and data were analyzed by using two way analysis of variance and Tukey tests.

Results: EndoRez did not set at all samples and therefore the bond strength values were not established. Push-out bond strengths were not significantly affected by the type of drying procedure of root canals (p > 0.05). The MTA Fillapex sealer showed significantly lower bond strength compared to the other sealers (p < 0.05). Conclusion: The use of ethanol and excess paper points did not affect push-out bond strength of sealers. AH Plus and iRoot SP were showed higher bond strength than MTA Fillapex.
P225
The Effect of Different Irrigation Solution on the Apical Sealing of Bioceramic Root Canal Sealer
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Aim: The aim of the present study was to evaluate the effect of different irrigation solutions on apical sealing of bioceramic root canal sealer.

Material and methods: Forty freshly extracted human maxillary and mandibular teeth with single straight root canals were selected. The root canals were instrumented crown-down technique using Mtwo rotary system up to no. of 40 size file. Root canals were irrigated 2 ml of 2.5% NaOCl after each instrument. The specimens were randomly divided into five groups (n:15 each) according to final irrigation solutions [5% NaOCl, 1.3% NaOCl + MTAD, 5% EDTA, Propolis, 2% Chlorhexidine (CHX)]. Root canals were obturated with lateral condensation technique using gutta-percha and bioceramic root canal sealer. The specimens were placed in Rhodamine-B dye solution and centrifuged at 30 G for 12 min and evaluated using stereomicroscope.

Results: The highest levels were determined Propolis and CHX groups, although the least levels were occurred MTAD and EDTA. The highest levels were determined Propolis and CHX groups was statistically significant (p < 0.05).

Conclusion: In conclusion, using of chelating agent has advantages of improving apical sealing of bioceramic root canal sealer.

P226
Comparison of Different Irrigant Agitation Methods in the Removal of Root Canal Debris
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Aim: The purpose of this study was to assess the cleaning efficacy of different irrigant agitation techniques on debris removal in root canals.

Material and methods: Sixty extracted human maxillary canines were instrumented using ProTaper rotary system under irrigation with 2.5% NaOCl. A standard groove was cut on the wall of one half of each root canal and filled with the same amount of dentin debris before irrigation procedures. Root canals randomly divided into six groups according to the final irrigation protocol of 2.5% NaOCl and 17% EDTA: Group 1: no-activation group; Group 2: Manual-dynamic activation group; Group 3: Endovac irrigation system; Group 4: Passive ultrasonic irrigation (PUI) with its power set at ½ of the scale (EMS; Optident, UK); Group 5: PUI with its power set at full power and Group 6: CanalBrush (Coltene Whaledent, Langenau, Germany) group. All irrigation protocols were performed in a closed system. Before and after irrigation procedure, the root halves were separated and the removal of dentin debris in the groove was determined under 40× magnification.

The data were analyzed by means of the Kruskal–Wallis test and the Mann–Whitney U-test.

Results: The debris score was statistically significantly lower in group 5 than other irrigation procedures (p < 0.05). Manual-dynamic activation (Group 2) and PUI with its power set at ½ of the scale (Group 4) were not produced better cleaning efficacy than conventional syringe irrigation (Group 1) (p > 0.05).

Conclusion: PUI with its power set at full power was significantly more efficient in the removal of root canal debris than other techniques.

P227
The Radiographic Features of C-Shaped Canal System in Mandibular Second Molars
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Aim: The purpose of this study was to investigate the radiographic features and the cross-sectional root canal configuration of C-shaped mandibular second molars.

Material and methods: The study group consisted of patients who had undergone both panoramic radiography and cone beam computed tomography (CBCT). The radiographs and the CBCT images were investigated retrospectively and this study was approved by the Ethics Committee of the University. The root canal morphology of the mandibular second molars was evaluated for the presence of a C-shaped root canal. The configuration of the C-shaped canal was categorized using the classification of Fan et al. Detection of the C-shaped root canal in CBCT scans was used as a ground radiographic truth. Then the second mandibular molars were classified in five categories according to their root shape viewed on panoramic radiographs. The presence of C-shaped root canal and the root types were correlated and results were subjected to chi-square statistical test. The interexaminer reliability was calculated using the Cohen’s Kappa test.

Results: A total of 339 mandibular second molars were analysed, out of which 29 (8.6%) molars exhibited C-shaped root canal system. The fused root morphology (Type III, IV and V) presented statistically higher C-shaped root canal (p < 0.01). Type II and IV root morphology demonstrated C3 canal configuration in all cross-sectional areas.

Conclusions: Evaluation of root shape from panoramic radiographs provide valuable information for detection and interpretation of C shaped root canal systems.

P228
Antibacterial Activity of Endodontic Irrigants Against E. faecalis
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Aim: The aim of this study was to assess the antibacterial activity of NaOCl and CHX against E. faecalis in contaminated root canals.

Methodology: Forty-two single rooted extracted human teeth were inoculated with E. faecalis and incubated for 4 weeks. The samples were divided in two control and two experimental groups irrigated with 3% NaOCl and 2% CHX. After a 1-week incubation, complete disinfection was confirmed by the absence of turbidity in the incubation media. Dentin shavings were taken from samples with no turbidity to verify whether E. faecalis was present in dentin tubules. Results were analyzed statistically using Fisher’s exact test, with the level of significance set at p < 0.05.

Results: Two out of six samples in 3% NaOCl group were infected after 1 day of incubation (33.3%), and an additional sample od dentin shavings become infected (16.7%), indicating that three out of six sample teeth were infected (50%). None of the samples in the 2% CHX group were infected, including dentin shavings after 1 week incubation. Fisher’s exact test demonstrates that 2% CHX was significantly more effective than 3% NaOCl (p < 0.01).

Conclusion: CHX possesses superior bactericidal activity compared with NaOCl against E. faecalis in contaminated root canals.

Endodontic Retreatment of Lower Premolars
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Aim: The endodontic retreatment of the lower premolars is due to the misconception that all lower premolars show an endodontic system with a predictable morphology, having one root and one canal. Our study reveals the frequency of retreatments in our clinic, due to the presence of the second canal.

Materials and methods: Five hundred and twenty-nine clinical cases of lower premolars requiring endodontic treatment where registered over a period of 4 years. The retreatment cases were separately indexed and retreatments due to the presence of the second canal or second root where separately recorded for this study.

Results: Out of 529 endodontic treatments, 106 were retreatments and among those, a number of 33 cases revealed a second canal.

Conclusions: The endodontic treatment of the lower premolars is frequently addressed with superficiality, thinking that they have a simple morphology. The clinical cases presented reveal though, a complex morphology, that exemplify all four classification types frequently addressed with superficiality, thinking that they have a simple morphology. The clinical cases presented reveal though, a complex morphology, that exemplify all four classification types.

Lower premolars tend to reach retreatment in 20% of the clinical cases because of the complex morphology of the endodontic system, this situation being showcased through our clinical cases study.

Quality of Root-Canal Treatments Performed by Undergraduate Students in University of Marmara
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Aim: The aim of this study was to determine the radiological technical quality of root-canal fillings (RCF) performed by third grade dental students for the first time in Faculty of Dentistry, Marmara University, Turkey.

Materials and methods: Digital periapical radiographs taken from 120 single-rooted teeth treated by third grade students in Department of Endodontics during 2011–2012 were assessed. Technical quality was evaluated in terms of length and homogeneity. Length of RCF was evaluated based on three criteria as short, adequate and overfilled. Homogeneity was assessed based on two criteria as adequate and inadequate. The taper of the RCF was determined as either appropriate or inappropriate. Following radiological assessment, data were statistically analysed using Chi-square test.

Results: With regard to length, of the 120 RCFs, 79.2% were appropriate, 7.5% were short and 13.3% were overfilled. Homogeneity of the RCFs was found to be adequate in 72.5% and inadequate in 27.5%. Taper was found to be 65% adequate and 35% inadequate. There was no significant relationship between either the length and homogeneity or the length and taper of the RCFs (p > 0.05). In terms of length, of the RCFs with appropriate homogeneity, 74.7% were adequate, 55.6% were short and 68.8% were overfilled. With regard to taper, of the RCFs with appropriate taper, 65.3% were adequate, 66.7% were short and 62.5% were overfilled.

Conclusions: The general technical success rate of RCFs in single-rooted teeth performed by third grade students for the first time in Dentistry Faculty of Marmara University was found to be 75.5%.
calculated as the percentage of the area. Data were analysed using One-way ANOVA and Student t-tests.

**Results:** The amount of remaining debris at 1 mm from the apex was 18.11%, 12.71%, 7.12%, 4.42% for the NI, PUI, SAF and EV groups, respectively. The amount of remaining debris at 3 mm was 9.61%, 8.42%, 5.22%, 2.61% for the NI, PUI, SAF and EV groups, respectively. The amount of remaining debris for the EV group was significantly lower compared to the other groups (p < 0.01) and the amount of remaining debris at 3 mm was significantly lower compared to the amount at 1 mm (p < 0.01).

**Conclusion:** In comparison to other irrigation techniques, EV irrigation resulted in significantly lower amount of remaining debris. Better results were obtained with all of the tested irrigation techniques at 3 mm from the apex when compared to 1 mm.

**P232**

**Comparison of the Antimicrobial Effects of Six Different Intracanal Medicaments on Enterococcus faecalis**

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**Aim:** The purpose of this study was to determine the in vitro antimicrobial ability of six different intracanal medicaments on Enterococcus faecalis (E. faecalis).

**Materials and methods:** An agar well diffusion test and was used to determine the efficacy of the experimental medicaments in removing E. faecalis (ATCC 29212). Medicaments were divided into seven groups; calcium hydroxide (Ca(OH)2) with saline, Ca (OH)2 with an anaesthetic solution, Ca(OH)2 with propylen glycol, commercially available premixed Ca(OH)2 paste, chlorhexidine gluconate gel, triple antibiotic powder (metronidazole, ciprofloxacin, doxycycline) with propylen glycol and commercially available premixed Ca(OH)2 paste, chlorhexidine gluconate gel, triple antibiotic powder (metronidazole, ciprofloxacin, doxycycline) with propylen glycol and talk powder with saline as negative control group. The diameters of the growth inhibition zones for each group were measured after 24 and 48 h. Differences between groups were analysed using Kruskal–Wallis and Mann–Whitney U-tests, and intragroup differences were analysed using Wilcoxon sign test.

**Results:** Diameter of the inhibition zone observed for the triple antibiotic mixture was significantly larger (p < 0.01) and the diameters of the inhibition zones for the chlorhexidine gluconate gel was significantly smaller in comparison to the other tested medicaments (p < 0.05). Increase in time resulted in greater antibacterial effects in all groups, especially in Ca(OH)2 with propylen glycol and commercially available premixed Ca(OH)2 paste (p < 0.01, p < 0.05).

**Conclusion:** All of the tested medicaments were found to be effective on E. faecalis. However the results suggest that the triple antibiotic paste would be the preferred medicament against E. faecalis as it has the greatest antibacterial effect among the tested medicaments.

**P233**

**Efficacy of Different Activation Regimes of Chitosan**

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**Introduction:** The purpose of this study was to assess the effect of various irrigation protocols for smear layer removal on the bond strength of MTA fillapex.

**Methodology:** Twenty-four extracted single-rooted human teeth were prepared by a crown down technique. The roots were divided into four groups of six roots each. After standardization of canal spaces, root segments were randomly assigned into four groups (n = 6) according to irrigation procedure (3 min and 3 ml for each solution): group 1; %5,25 NaOCl + %17 EDTA and 30-s ultrasonic passive irrigation; group 2; %5,25 NaOCl + %0.2 chitosan and 30-s ultrasonic passive irrigation; group 3; %5,25 NaOCl + %17 EDTA and 40-s Er,Cr: YSGG laser treatment (Biolase Technology, Inc, San Clement, CA), and group 4; %5,25 NaOCl + %0.2 chitosan, 40-s Er,Cr: YSGG laser treatment (Biolase Technology, Inc, San Clement, CA, USA). Then the canal spaces were filled with MTA fillapex (Angelus, Brazil) using single cone technique to achieve 0.03 mm sealer thickness. After incubation for 1 week, samples were sectioned into 1 mm thickness and dislodgement resistance of the samples was measured using a universal testing machine at a crosshead speed of 0.5 mm/min. Data were analyzed using Kruskal–Wallis test (p = 0.05).

**Results:** No significant difference was found between the tested groups (p > 0.05).

**Conclusion:** The results of this study indicated that either passive ultrasonic irrigation or Er,Cr: YSGG laser can improve the bond strength of MTA fillapex-root dentin when compared with the conventional methods.

**P234**

**Dental Students’ Awareness of Ergonomic Postural Requirements During Endodontic Treatments**

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**Aim:** It is well known that endodontists are exposed to various occupational risk factors, especially postural ones that may lead to work-related musculoskeletal disorders.

The aim of or paper is to assess dental students’ awareness concerning requirements of ergonomic posture during endodontic treatments, as well as how they clinically apply these requirements.

**Materials and methods:** Three hundred and fifty dental students from 4th and 5th year, officially registered in the University of Medicine and Pharmacy, aged 22–24, were invited to participate in the study. They had to answer a 31 items questionnaire. The participant students were photographed during a standard clinical treatment session to evaluate ergonomics compliance. The students...
were then evaluated using Pearson’s test of visual perception. We used the analysis of variance (ANOVA), Mann–Whitney U-test, \( \chi^2 \)-tests for the statistical analysis.

**Results:** According to the given answers, more than half (60%) of the dental students had knowledge about ergonomics. A third (33.3%) of the photographed cases were in compliance with ergonomic requirements.

**Conclusion:** The students showed satisfactory knowledge of ergonomics postural requirements and clinical application during endodontic treatments. We consider that it is of utmost importance that the dental students should be aware of a good working posture as early as possible during endodontic care.

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**P235**

**Root Canal Configuration of Maxillary Molars in a Turkish Population**

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**Objective:** To investigate variations in root canal systems of the permanent maxillary first and second molar teeth in a Turkish population using cone-beam computed tomography (CBCT).

**Material and methods:** Twenty-two boys and 26 girls (age range of 8–16 years) were enrolled in the study. The CBCT examinations (Newtom 3G, QR Verona, Italy) which were required previously for their investigations were retrospectively evaluated. One hundred forty-nine maxillary first and second molars were examined. The number of roots and their morphology; the number of canals per root; the canal configuration; the frequency of mesiobuccal/distobuccal and palatinal roots in the maxillary molars were evaluated. The root canal morphology was categorized and compared according to Vertucci (1984). Mann–Whitney U-test was performed in this study (p \( \leq 0.05 \)).

**Results:** All of the first and second molars had three separate roots. Three canals were found in 45.8% of maxillary first molars and 53.1% of them had four canals. In the maxillary second molars, 58.5% of them had 3% and 41.5% had four canals. Most distal and palatinal roots had a type I configuration. The mesiobuccal root tended to have more variations in the canal system followed by the distobuccal root, whereas the palatal root had the least. No statistical significant difference was found among canal configurations, gender and sides (p \( \geq 0.05 \)).

**Conclusions:** Morphological variations in the root canal system were found to be common in our study. CBCT can be a powerful tool for examination of this region with capable of making measurements and 3D representations with less ionizing radiation.

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**P236**

**Bony Defects Healing Using Grafting with GTR After Endosurgery**

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**Aim:** To compare the efficiency of bone graft material (tri calcium phosphate) alone or its combination with bioabsorbable Guided tissue regeneration (GTR) barrier membrane (collagen membrane) to heal large periapical bony defects.

**Materials and method:** After the approval of the university’s ethical committee, a total of 45 patients of both sex with age from 20 to 40 years old and with large periapical radiolucency related to two teeth with at least 10 mm in diameter were divided equally into three groups. Group A: Filling osseous defect with bone graft material only. Group B: Filling osseous defect with bone graft material and Membrane. Group C: Open Flap debridement only (Control group). Pre-operative radiograph was taken using the intraoral digital imaging system for the assessment of lesion size and bone density. Then, root canal and periapical surgical procedures were done, including root-end cavity preparation using ultrasonic technique and retrograde filling with MTA. Healing was evaluated by the densitometric analysis of the periapical lesions using digital imaging system software (Digora) immediately postoperative, at 2 weeks, 1 and 6 months later to assume the density of the bone formed.

**Results:** The statistical results showed that the use of bone graft material alone or with GTR accelerated the healing of periapical bony defect. Also it was found that group (B) was the best among the other two groups with a significant p-value < 0.05.

**Conclusion:** Use of GTR technique and bone graft material enhanced the healing potentiality of periapical bony defects.

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**P237**

**Bactericidal Effect of Different Power Parameters of KTP Laser Against Enterococcus faecalis**

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**Aim:** The objective of this study was to evaluate the antimicrobial activity of different power settings potassium-titanyl-phosphate (KTP) laser in experimentally infected root canals.

**Materials and methods:** A hundred nineteen single-rooted mandibular premolars teeth were employed. After preparation and sterilization, the specimens inoculated with 15 \( \mu l \) Enterococcus faecalis for 24 h at 37°C. The contaminated roots were divided into five experimental (1 W, 1.5 W, 2 W, 3 W, 4 W KTP laser) groups, one negative control (NaOCl) group and one positive control (saline) group of 17 teeth each. Before and after carrying out applications in groups, samples received with sterile paper points from the root canal were transferred to tubes containing 5 ml of brain
heart infusion broth. Then 10 µl of these suspensions were received and placed in two different sides of the blooded agar medium. Bacterial reduction was counted according to the CFU localization. Test data of direct composite veneers was included: number, localization, indications, method of application and outcome. Data analysis was performed using standard statistical methods (SPSS 17.0).

Results: Maximum decrease has occurred in the group that 2.5% of NaOCl was employed. This decrease was followed by the KTP laser groups in order of 4 W, 3 W, 2 W, SF, 1.5 W and 1 W. Statistically, the difference between 1 W KTP laser group and all groups, and the difference between the group that 2.5% of NaOCl was used and all groups except of 4 W KTP laser group were found significant (p < 0.05).

Conclusions: The high power KTP laser irradiation showed more antibacterial activity against Enterococcus faecalis.

Theme: Dental Treatment & Restorative Dentistry: Esthetics

P238
Risk in Esthetic Rehabilitation of Patients with Direct Composite Veneers
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Objective: To investigate risk factors in esthetic rehabilitation of patients with direct composite veneers.

Material: The study included 328 patients, who were esthetically rehabilitated with direct composite veneers applied by multi-layering technique, from 1 January 2008 to 31 December 2012. In all patients were analyzed: gender, age, professional sports activity, indications for teeth veneers and method of application. In cases of patients with correction of direct composite veneers were analyzed: number of corrections, localization of facets and type of complications. Data analysis was performed using standard statistical methods (SPSS 17.0).

Results: Of the total number of patients (328), correction of direct composite veneers was required in 36 (11.0%) cases. Number of corrections varied: one correction in 3.7%, two corrections in 4.9% and three corrections in 2.4% patients. Complications for corrections were: debonding in 2.4% and breaking in 8.5% patients. Analysis determined no association between correction of composite veneers in patients with gender and age (p > 0.05) and found a significant correlation with professional sports activity (p < 0.01). Analysis found a significant correlation between correction of dental veneers with tooth abrasion (p < 0.01) and did not find connections to other indications in patients (p > 0.05). Analysis established no association between correction of direct composite veneers in patients and method of applications, such as preparation, adhesives and composites (p > 0.05).

Conclusion: Potential risk factors for correction in esthetic rehabilitation of patients with direct composite veneers are professional sports activity and teeth abrasion.

P239
Outcome of Direct Composite Veneers in Patients as Esthetic Rehabilitation
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Objective: To examine outcome of direct composite veneers in patients as esthetic rehabilitation.

Material: The study included 328 patients with direct composite veneers applied by multi-layering technique, from 1 January 2008 to 31 December 2012. In all patients were analyzed: gender and age. Test data of direct composite veneers was included: number, localization, indications, method of application and outcome. Data analysis was performed using standard statistical methods (SPSS 17.0).

Results: Of all patients (328), there were 92 males (28.0%) and 236 females (72.0%). The average age in the patients was 34.5 ± 11.8 years. The total number of direct composite veneers in the patients was 1972, with the average number of 6.0 ± 4.1. Indications for teeth facets were: change in color (70.7%), change in position (36.6%), non-vital tooth (18.3%), diastema (32.9%), “gummy smile” (8.5%), caries (39.0%), fractures (15.9%), abrasion (14.6%), anodontia (4.9%), “crossbite” (3.7%), teeth crowding (8.5%). Localization of teeth facets was: on both jaws (19.5%), on the upper jaw (79.3%) and on the lower jaw (1.2%). Method of direct application of teeth veneers was with preparation (96.3%), using self-etching adhesive 7th generation (98.8%) and micro-hybrid composite (95.1%). In the follow-up period from 1 to 5 years, 272 (82.9%) patients still had the direct composite veneers.

Conclusion: Direct composite veneers applied by multi-layering technique are an appropriate esthetic rehabilitation and a fast solution for numerous indications in patients with a favorable outcome.

P240
Evaluation of the Aesthetic Problems Encountered in Restorative Dentistry
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Aim: The aim of the present study was to evaluate, aesthetic problems encountered by the dentists (working at private health institutions or dental faculties) in the areas with distinct socio-economic conditions and their preferred methods of treatment by using a multi-center questionnaire.

Materials and methods: Our research is based upon a questionnaire including five questions related with five different aesthetic problems. One hundred dentists were asked to complete the questionnaire. The areas of aesthetic problems were determined as fluorosis, common abrasion, common discoloration, crowding and excessive material loss. The questionnaire includes the questions such as dentists’ age, gender and the faculty he/she graduated from, graduation year, location of occupation and if they were
holding any specialization or not. Thirty-seven female and 63 male out of 100 dentists had participated in our research.

Results: Statistical analysis was performed using Student t-test was used. It revealed that there were no statistically significant differences between the aesthetic problems and features of dentist (p > 0.05). Besides, differences were observed between the treatment choices of dentists for patients with higher economic status and for patients with lower income levels. However these differences were found to be statistically insignificant.

Conclusion: Based on the results of our research it was concluded that, having a specialization on any field of dentistry is not found to be the major factor in the choice of treatment for the dentists. Besides, while preferring the treatments for the aesthetic problems, dentists consider the economic conditions and aesthetic concerns of the patients.

P241

Crown Fracture of Maxillary Central Incisors: Restorative Aspects in Children
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Introduction: Crown fractures of maxillary incisors are frequent traumatic injury to the permanent dentition. The purpose of this case series was to determine the efficacy of crown fracture restoration in children with permanent dentition.

Case series: During 2012, 18 teenagers aged 14–17 with extensive, uncomplicated crown injury without the pulp involvement (class II fracture based on the Ellis classification) were treated and followed-up. Fractures developed during recreational sport activities (bicycle ride, skateboarding, sledding, skating, rollerblading). Boys and girls were equally represented and developmental or psychological risk factors for crown fracture were absent in our sample. After diagnosis, teeth and oral cavity inspection, radiographs, and electric pulp vitality testing, crown was restored 1–5 days after trauma with composite material with or without the use of pulpal pins. Children were followed up at regular intervals, at 1, 3, 6, and 12 months after reconstruction. During follow-up, in all patients reconstructed teeth retained vitality, esthetics and function.

Conclusion: Crown of maxillary central incisors damaged after recreational activity trauma can be completely restored with composite materials and pulpal pins attaining previous and satisfying function and esthetics.

P242

The Multidisciplinary Treatment of Subgingivally Fractured Central Incisor Tooth
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Aim: Obtaining the marginal adaptation is one of the most important factors in both maintaining the health of the dentition and obtaining the esthetics for the long term in the treatment of subgingivally fractured anterior teeth. Multidisciplinary treatment of such a case treated successfully from the orthodontic, prosthetic and periodontologic points of view will be described.

Method: A 17 years old female patient presented with subgingivally fractured right central incisor. Her clinical and radiological examination revealed the complex horizontal tooth fracture below the gingival margin. Since sufficient root length was present, we decided to restore the tooth. After the endodontic treatment, an orthodontic pin was fixed in the residual root dentin, the brackets were placed on only upper anterior teeth and forced eruption technique was used in conjunction with circumferential supracrestal fibromotoy and root planning every 10 days. After a total of 40 days, teeth were stabilized for 4 weeks and limited crown lengthening was carried out to level the gingival margins for better esthetics. Six weeks after the surgery the tooth was restored with an all ceramic crown for optimum esthetic results.

Results: The 6 month follow up period demonstrated periodontally and prosthetically satisfactory results both from clinical and radiographic point of view.

Conclusion: Forced eruption combined with circumferential supracrestal gingival fibromotoy allows the tooth to assist in the support of a single crown and maintain its individual integrity while contributing to esthetics and function in the treatment of subgingivally fractured tooth.

P243

Effects of Blue Light to Mitochondria in Human Gingival Fibroblasts
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Aim: We have investigated effects of the blue light used for dental esthetic treatment, such as official bleaching or class V composite resin treatment, on human gingival fibroblasts (HGFs).

Material and methods: We performed the absorbance measurement for the cell proliferation activity by 3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium assay, fluorimetry for determination of reactive oxygen species (ROS) with CellROX as biochemical examination and observed the morphology by transmission electron microscopy on HGFs, in addition, it was shown a significant decrease by irradiated by Quartz Tungsten Halogen Lamp (QTH) and Light Emitting Diode (LED). Tukey’s multiple comparison tests were used for the statistical analyses. A p-value of <0.05 was considered to be statistically significant.

Results: The both blue light irradiation of QTH and of LED decreased the cell proliferation activity in time-dependent manner on HGFs, in addition, it was shown a significant decrease by 5 min light irradiation using LED comparison with QTH. Regarding as morphologic study, the cytotoxic effect was observed in cell organelles, especially mitochondria. Furthermore, ROS generation
induced by blue light irradiation was detected in HGFs mitochondria using fluorimetry.

**Conclusion:** These results suggested that the blue light irradiation, especially using LED, might be adverse effects on the human gingival tissue in dental esthetic treatment include tooth bleaching. Hence, it would be necessary to develop a new dental esthetic treatment for protection on HGFs from the blue light.

**P244**

**Adaptation of Maxillary Anterior All-Ceramic Crowns and 2-year Randomized Controlled Clinical Trial**

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**Aims:** The aim of this randomized-controlled clinical trial was to compare marginal and internal adaptation of all-ceramic crowns fabricated with CAD/CAM and heat-pressed techniques before luting and clinical outcomes at baseline and 6, 12 and 24 months after luting.

**Methods:** This study was approved by Ethical Committee of Faculty of Medicine, Ege University (09-5/4). Fifteen CAD/CAM (CC) and 15 Heat-pressed (HP) all-ceramic crowns were placed in 15 patients. Silicone replica was obtained to measure marginal and internal adaptation of each all-ceramic crown before luting, and they were sectioned bucco-lingually and mesio-distally. Marginal and internal adaptation were measured using computerized light microscope at 40× magnification. Clinical evaluations took place at baseline (2 days after luting) and at 6, 12 and 24 months after luting. Replica scores were analysed using Mann–Whitney U and student t-test (α = 0.05). Survival rate of crowns was determined using Kaplan–Meier statistical analysis.

**Result:** Median marginal gap for CC group was 132.25 and 130.25 μm for HP group. Mean internal adaptation for CC group was 220.31 ± 51.31 and 210.57 ± 31.05 μm for HP group. There were no statistically significant differences with respects to marginal opening (Mann–Whitney U-test, p = 0.95) and internal adaptation (student t-test, p = 0.535) between two groups. Based on modified Ryge criteria, 100% of the crowns were rated satisfactory during 2 years period.

**Conclusion:** In this in vivo study, CAD/CAM and heat-pressed all-ceramic crowns exhibited similar marginal and internal adaptation. 100% success rate was recorded for both 15 CAD/CAM and 15 Heat-pressed all-ceramic crowns during 2 years period.

**Theme:** Dental Treatment & Restorative Dentistry: Materials

**P245**

**Study of Microleakage Using OptibondTM XTR, Through Radiotopotic Methods**

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**Aim:** Evaluate the microleakage of dental restorations using OptibondTM XTR (Kerr). The null hypothesis was that the type adhesives system didn’t have influence in what concerns to microleakage.

**Materials and methods:** Sixty noncarious extracted human molars were selected and cut in two equal halves occlusogingivally. Class V cavities (4/3/3 mm) were prepared on the buccal or lingual surfaces of each tooth with gingival margin walls in enamel. The specimens were divided randomly in four groups: (i) was applied OptibondTM XTR; (ii) was applied ClearfillTM SE BOND (Kuraray); (iii) the cavities weren’t restored; (iv) was applied OptibondTM XTR. In groups 1, 2 and 4 the enamel was conditioned (37% orthophosphoric acid) before the adhesive application and restored with SonicFillTM (Kerr). The specimens were stored in distilled water (37°C, 7 days) and after thermocycling (500 cycles, 5 and 55°C, dwell time 30”). Two coats of nail polish were applied to the external surface around of each cavity except the negative control group, where the crowns were completely sealed. The specimens were submersed in a solution of 99mTc-Pertechnetate. The radioactivity was counted. The nonparametric Kruskall–Wallis test with Bonferroni correction at a significance level of 5% were used for the statistical analyses.

**Results:** Results showed that there weren’t statistically significant differences (p > 0.05) among the groups restored with the adhesives ClearfillTM and OptibondTM.

**Conclusion:** Based on the results of this study, the OptibondTM XTR doesn’t reduce microleakage compared to ClearfillTM SE BOND.
two-part and commercial one-part silanes respectively. After 6 months, the mean bond strengths between composite and porcelain were 7.49, 10.05, 6.89 and 10.05 MPa using these silanes. The effect of silane coupling agent and time were significant on the bond strength values (p < 0.0001).

Conclusion: As suggested by results, microshear bond strength of experimental one and two-part silanes were similar to commercial two-part group in 24 h and 6 months. Silane coupling agents and all treatments experienced significant reductions in bond strength after 6 months with the exception of commercial one-part silane.

P247
Investigation the Effect of Adhesives to Water or Ethanol Saturated Dentin by Using Cavity Cleansers
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Objectives: The purpose of this study was to evaluate the effect of adhesives on the microtensile bond strength to water or ethanol saturated dentin by using cavity cleansers.

Methods: Thirty-six occlusal carious and non-carious extracted human molars were used for this in vitro study. The middle 1/3 of the occlusal crown was removed and the surfaces were flattened. A caries detecting dye solution was used to identify caries-infected, caries affected and sound dentin. The specimens were assigned to 12 groups. Cavity disinfectants (Cavity Cleanser and HealOzone), dentin bonding agent (Optibond FL) were applied to acid etched and ethanol or water saturated dentin and then a resin-based composite (Tetric Ceram) were placed according to manufacturer’s instructions. Bonded specimens were sectioned to form sticks with a cross sectioned area of approximately 1 mm². Data were statistically analyzed by using one-way ANOVA followed by post-hoc Tamhane test.

Results: Ozone application significantly decreased the μTBS when compared with the other groups (sound: 21.56 ± 2.42 MPa/caries affected: 16.98 ± 3.97 MPa) (p < 0.0001). The use of ethanol in carious affected dentin group showed the highest μTBS when compared to other groups (p < 0.0001). μTBS test results indicated that use of a 2% chlorhexidine and ethanol showed similar values in caries affected dentin while demonstrating higher results in sound dentin.

Conclusion: The μTBS to caries affected dentin were lower than sound dentin. Ozone application reduced the μTBS both caries and sound teeth. Ethanol application showed good results both caries and sound groups.
were prepared for measurement of compressive strength using Universal Testing Machine (UTM).

**Data analysis:** Data was analyzed using SPSS by one way ANOVA and Bonferroni multiple comparison tests at 5% level of significance.

**Results:** The value of compressive strength of Giomer is greater than that of Composite and Compomer but the fluoride release capability of Giomer becomes low in comparison to Glass Ionomer but not significant in comparison to compomer.

**Conclusions:** Giomer have high compressive strength (271 Mpa) and an initial fluoride (1.41 ppm) release. It also exhibit fluoride recharge capabilities. So, Giomer to be a better restorative material other than any fluoride releasing materials.

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**P251**

**Marginal Sealing of Class V Resin Composite Restorations with Low-Viscosity Resins**

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**Objectives:** Sealing of Class V composite restoration margins with low-viscosity resins may reduce or avoid problems related to marginal interface. This study evaluated in vitro effect of several low-viscosity resins on reducing microleakage of Class V resin composite restorations.

**Methods:** Class V cavities (n = 8) with coronal margins in enamel and cervical margins in cementum were prepared on buccal and lingual surfaces of molars and restored with self-etch adhesive (Single Bond Universal Adhesive) and resin composite (Filtek Z550). Following finishing and polishing procedures; surface-penetrating sealant (GroupII-PermaSeal), liquid polish (GroupIII-BeiscoverLV) or one-bottle bonding agent (GroupIV-Single Bond Universal Adhesive) was applied onto restoration margins. Restorations in group I were non-sealed for control. After restorations had been aged by thermocycling and loading, teeth were immersed into 2% basic fuchsin solution. Teeth were sectioned; dye penetration was analyzed using stereomicroscope using 0–3 ordinal grading scale. Statistical analyzes were conducted using Kruskal–Wallis and Mann–Whitney U-tests at 0.05 level of significance.

**Results:** At enamel margins, bonding agent exhibited significantly less microleakage compared to control and BiscoverLV groups; whereas results of PermaSeal group were comparable with results of bonding agent and BiscoverLV groups. At dentin margins, all sealed groups revealed significantly less microleakage than control group; however differences among sealed groups were not statistically significant. No remarkable difference was found between enamel and dentin margins within each group, except for control.

**Conclusion:** Marginal sealing is effective on reducing microleakage of Class V composite restorations. Of low-viscosity resins evaluated, bonding agent showed the highest marginal sealing ability.
lingual surfaces of molars and restored with glass-ionomer system (Group A-Equia), bonded glass-ionomer sytem (Group B-Equia), compomer (Group C-Dyra) or resin composite (Group D-Filtek Z250) as per the manufacturers' directions. A self-etch bonding (ClearfilSE Bond) was used in groups B, C, D. After all restorations had been aged by thermocycling and loading, all teeth were immersed into 2% basic fuchsin solution. Teeth were sectioned; dye penetration (microleakage) was analyzed under stereomicroscope using 0–3 ordinal grading scale. Statistical analyses were conducted using Kruskal-Wallis and Wilcoxon sign-rank tests at 0.05 level of significance.

**Results:** At enamel margins group A exhibited significantly less microleakage than group B; however mean microleakage score of group C is significantly less than group A’s. At enamel margins group B revealed significant leakage compared to all other groups; whereas groups C and D revealed comparable results. No remarkable difference was observed between enamel and dentin margins in groups A and B.

**Conclusion:** Microleakage continues to be a pending problem in Class V novel glass-ionomer restorations irrespective of being bonded with an adhesive or not.

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**P254**

**Physico-Chemical Assessment of Mechanically Degraded Interface of Biodentine Base**

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**Aim:** Study aimed to physico-chemical assessment of the mechanically degraded interface of Biodentine (BD)/composite as a substitution to glass ionomer in Sandwich technique.

**Methods:** Twenty freshly extracted sound teeth were ground to expose dentin to be used as reference substrate. Forty discs of Biodentine (Septodont) and Glass Ionomer (3M ESPE) were prepared. Each group was divided into two groups (n = 10) according to the adhesive tested, AdperTM Single Bond Plus (3M ESPE) representing two step total etch adhesive (TE) and ScotchbondTM Universal (3M ESPE) representing self-etch adhesive (SE). Adhesives were applied to substrates, and composite cylinders (0.9 mm diameter × 0.7 mm length) were formed. After 24 h. distilled water storage specimens were subjected to micro-shear testing. The spatial structure, mineral, collagen and amide I quantities of degraded interfaces were assessed using Fourier transform infrared spectroscopy and field emission scanning microscope.

**Results:** Chemical analysis of FTIR spectra of Biodentine revealed the right shift of spectra and higher mineral contents than glass ionomer (0.04 and 0.03 au respectively). Mineral/collagen ratio for BD was higher than glass ionomer samples (2 and 1.5 au respectively). At the same time there was no difference between TE & SE treatments to either BD or GI.

**Conclusions:** (i) Biodentine can substitute glass ionomer base under composite restoration. (ii) Adhesive strategies didn’t affect mechanical degradation of Biodentine base under composite.

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**P255**

**One-year Clinical Evaluation of Class 5 Composite Restorations**

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**Purpose:** Aim of this double blind study was to compare the 12-month clinical performance of cervical restorations placed with the use of two different microhybrid resin composites.

**Subject and methods:** Twenty patients with at least one pair of non-carious cervical lesion participated in this study. Ninety-seven cervical lesions were restored with either TPH Spectrum (n = 48) or Filtek Z250 (n = 49) using a two-step etch&rinse adhesive (Single Bond 2) Restorations were evaluated using modified USPHS...
criteria after 12 months. The statistical comparison of resin composites for each category was performed with the Pearson chi square test and the performance of restorations at the baseline and after 12 month recall time was evaluated by McNemar’s test (p < 0.05).

Results: The recall rate of the patients was 100%. The retention rates were 89.6% and 91.8% at 12-months for TPH and Z250, respectively and no statistically significant differences were observed with each evaluation criteria (p > 0.05).

Conclusion: Cervical restorations placed with two different micro-hybrid composites and a two step etch and rinse system showed satisfactory clinical performance after 12-months.

P256

Effect of Light-Curing Modes on Staining Susceptibility of a Nano-Hybrid Resin Composite

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Objectives: This in vitro study investigated staining susceptibility of a nano-hybrid resin composite light-cured in different modes and immersed in different staining media.

Methods: Disc-shaped specimens (8 x 2 mm; n = 7) were prepared from nano-hybrid resin composite (Filtek Z550) of shade A2 and light-cured according to one of following modes: Halogen (GI), LED standard (GII), LED pulse (GIII) or LED ramp (GIV). Half of the specimens of each group were stored in one of the staining media (red wine or coffee) for 10 min/day during experimental period. Colour measurements were performed using spectrophotometer (VITA Easyshade) according to CIEL*ab system at predetermined evaluation periods: baseline, 7, 28 and 56 days. Colour differences (ΔE) between the groups (for each immersion medium) were submitted to Chi-square and Kruskal–Wallis tests at 0.05 level of significance.

Results: In 7-day evaluation period, colour change values of specimens immersed in coffee revealed no remarkable difference among the groups (p > 0.05); whereas specimens in GIV were significantly less stained compared to specimens in GII, GIII when immersed in red wine (p < 0.05). After 56-days of immersion in red wine, specimens in GIV showed statistically significant colour change compared to other groups (p < 0.05). However specimens in GI revealed the least staining after 56-days of coffee immersion, and the result was statistically different from all LED groups (p < 0.05).

Conclusion: The findings of this study suggest that light-curing mode influences the staining susceptibility of the tested nano-hybrid resin composite. Halogen mode showed lower susceptibility of resin composite to staining than all LED modes in long-time.
P259
Influence of Gingival Margin on the Microleakage of Bulk-Fill Composites
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Aim: To evaluate the influence of the location of the gingival margin on the microleakage of proximal restorations restored with bulk-fill composites.

Materials and methods: Thirty-six freshly extracted human third molars were used. Standardized Class II cavities were prepared on both mesial and distal sides as follows: mesial gingival margins located 1 mm above the CEJ (cemento-enamel junction) and distal gingival margins located 1 mm below the CEJ. The cavities were etched and rinsed and a total-etch adhesive system (Prime and Bond NT, Dentsply) were applied. The teeth were randomly divided into three groups (n=12): In Group G; the cavities were restored with GrandioSO (Voco) in 2 mm increments. In Group S and M the cavities were restored with bulk-fill flowable composites (SDR, Dentsply and Filtek Bulk Fill, 3M Espe, respectively) in the first 4 mm layer and GrandioSO for the residual height of the cavity. The specimens were thermocycled (1000 cycles, 5–55°C) and immersed in 0.02% Rhodamine B solution for 24 h. The specimens were examined under a stereomicroscope. The data were subjected to Kruskal–Wallis and Wilcoxon tests at p < 0.05.

Results: No statistically significant differences were observed between composite groups in enamel and dentin margins (p > 0.05). Although in Group G and Group M significant differences were observed between enamel and dentin margins (p < 0.05), with enamel margins exhibiting lower degrees of microleakage, in Group S the difference was not significant (p = 0.317).

Conclusion: SDR flowable resin composite would be preferable in proximal cavities located below the CEJ.

P260
Comparison of Two New Commercial Calcium Silicate-Based Materials
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Aim: The purpose of this study was to compare two new commercially available calcium silicate–based materials with regard to setting time, compressive strength and radiopacity.

Materials and methods: Biodentine (Septodont, Saint-Maur-des-Fosses, France) and MM-MTA (Micro-Mega, Besançon Cedex, France) were tested in this study. Seven specimens were mixed freshly for each group and each test. The initial and final setting time, compressive strength and radiopacity were assessed by Gilmore apparatus, universal mechanical testing machine, and phosphor plates of a digital imaging system with an aluminum stepwedge, respectively. Data were analyzed by analysis of student t test at 5% significance level.

Results: The initial (7 ± 0.8 min) and final setting times (15 ± 2 min) of Biodentine were significantly lower than MM-MTA (20 ± 2.6 and 49 ± 6 min). The mean compressive strength of Biodentine (119.6 ± 29.8 MPa) was significantly higher than MM-MTA (21 ± 6.1 MPa) On the contrary, MM-MTA presented significantly higher radiopacity values (5.0 mm Al) than Biodentine (2.3 mm Al) (p < 0.001).

Conclusions: Biodentine would be a potentially useful material because of the short setting time and high compressive strength values for clinical application especially during apical surgery. Nevertheless, radiopacity value of Biodentine was not above the minimum level recommended by ANSI/ADA Specifications.

P261
Posterior Resin Composites: Are the Compressive Properties of Composites Affected by Water Sorption?
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Purpose: The aim of this study is to determine the compressive properties and water sorption characteristics of dental light-curing resin based composites used in direct posterior restorations. The null hypothesis of this study is that a prolonged immersion of composites in aqueous environment will affect the compressive properties of the materials.
Methods: The following commercially available light curing composites were studied: Filtek P60 (3M-ESPE), Rok (SDI), Surefill (Dentsply), Tetric EvoCeram Bulk Fill (Ivoclar Vivadent), x-tra fill (Voco) and Bright Posterior (DMF). The compressive strength was measured according to the ANSI/ADA No.27 specification, after storage of the composites in distilled water (37°C), for 24 h and 30 days. Water sorption characteristics were determined according to the method described in ISO 4049. The uptake of water was recorded for 30 days.

Results: The compressive strength of all the studied materials ranked within the range of clinically-accepted composites. Filtek P60, Bright Posterior, and x-tra fill composites showed higher values of compressive strength after 24 h of water storage. After 30 days of immersing the composites in distilled water, a change in compressive strength was observed. Lower water sorption values were shown for x-tra fill and Bright Posterior.

Conclusions: Resin-based composites used in posterior restorations are subject to compressive loads due to mastication. In addition, the aqueous oral environment affects the stability and longevity of the restoration. Therefore, composites with low water sorption values combined with high compressive strength will enhance the clinical performance of the restoration. The hypothesis of this study was confirmed.

P262
Surface Morphology of the Bulk Fill, Nanohybrid and Silorane Composites
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Aim: The aim of this study was to compare the surface properties and filler size of Surefill SDR (Dentsply), Xtra Base (Voco), Xtrafill (Voco) and Quixfill (Dentsply) bulk fill resins; Nanohybrid Grandio and Filtek Silorane (3MESPE) composites under scanning electron microscope (SEM).

Material and method: 10 mm × 2 mm disc shaped 30 composite samples (n = 5) were prepared. Finishing and polishing were procedure done with OptiDics (Kerr). All samples were waited distilled water at 37°C for 24 h. Scanning electron microscopy (SEM) was used to qualitatively characterize filler morphology and size. SEM analysis was performed to compare the filler size of the composite materials. Surface properties were investigated under ×500 magnification and particle size analysis were done under ×5000 magnification.

Results: Nanohybrid composite showed the smoothest surface and the silorane showed the roughness surface. The average particle size of and the biggest filler are: SDR 1.61 and 2.27 μm; Xtrafill 652.11 nm and 1.05 μm; Xtrafill 1.39 and 4.20 μm, Quixfill 1.06 and 1.45 μm; Grandio 794.68 nm and 4.88 μm; Silorane 756.13 nm and 1.48 μm.

Conclusion: SEM analysis revealed different patterns of surface roughness depending on the composite material. Bulk fill materials showed similar surface characteristics to nanohybrid composites; siloranes shows different matrix structure due to its siloxane based.

P263
Spectroscopic Properties of Bulk Fill Resin Composites Cured by LED Light Source
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Aim: The aim of this study was to determine the spectroscopic properties of bulk fill flowables as Surefill SDR (Dentsply) and Xtra Base (Voco); and bulk fill composites as Xtrafill (Voco) and Quixfill (Dentsply) resin composites cured by light emitting diode (LED).

Material and method: Spectroscopic properties of bulk fill resin composites were invistigated by means of infrared spectroscopy. Degree of conversion (DC) (n = 5) was investigated in real time for 5 min by Fourier transform infrared spectroscopy (ATR-FTIR) in a filling depth of 4 mm at irradiation time of 40 s. DC was evaluated by using by using the aliphatic/aromatic double bond peak ratios in the region (1680–1580/cm) before and after the photopolymerization. The results were analyzed with one way ANOVA and Tukey HSD test p < 0.05 was considered significant.

Results: The results in DC determinations with FT-IR demonstrate that Surefill SDR (15.27 ± 1.02), Xtra Base (39.01 ± 1.12), Xtrafill (30.87 ± 1.14) and Quixfill (17.39 ± 1.18). There is a significant difference between Voco and Dentsply bulk fill materials (p < 0.05).

Conclusion: DC is influenced by both resin matrix and photo initiator type. Xtrafill and Xtrabase have the same DC due to their same photoaccelerator. LED cured bulk fill composites achieved suficient polymerization.

P264
Microhardness of New Generation Posterior Composite Materials: BulkFill, Nanohybrid, Silorane
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Aim: The aim of this study is to compare the Vickers microhardness (VHN) of Xtrafill (Voco), Quixfill (Dentsply), Xtrafill (Voco), SDR (Dentsply) bulk fills; nanohybrid as Grandio (Voco); and Filtek Silorane (3M, ESPE) composites under 5 min by Fourier transform infrared spectroscopy (ATR-FTIR) in a filling depth of 4 mm at irradiation time of 40 s. The uptake of water was recorded for 30 days.

Material and methods: Seventy disc shaped samples were prepared (n = 10). Samples were cure by LED with 40s; polished with OptiDics (Kerr), waited for 24 h at 37°C before the tests. VHN were measured from three points from each samples after 1st, 7th and 14th days of distilled water storage.

Material and method: Spectroscopic properties of bulk fill resin composites were invistigated by means of infrared spectroscopy. Degree of conversion (DC) (n = 5) was investigated in real time for 5 min by Fourier transform infrared spectroscopy (ATR-FTIR) in a filling depth of 4 mm at irradiation time of 40 s. DC was evaluated by using by using the aliphatic/aromatic double bond peak ratios in the region (1680–1580/cm) before and after the photopolymerization. The results were analyzed with one way ANOVA and Tukey HSD test p < 0.05 was considered significant.

Results: The results in DC determinations with FT-IR demonstrate that Surefill SDR (15.27 ± 1.02), Xtra Base (39.01 ± 1.12), Xtrafill (30.87 ± 1.14) and Quixfill (17.39 ± 1.18). There is a significant difference between Voco and Dentsply bulk fill materials (p < 0.05).

Conclusion: DC is influenced by both resin matrix and photo initiator type. Xtrafill and Xtrabase have the same DC due to their same photoaccelerator. LED cured bulk fill composites achieved suficient polymerization.

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(22.96 ± 1.45) in all groups. There is no significant difference between 1st and 14th day of VHN of SDR (p = 0.189), Xtrafill (p = 0.131) and Silorane (p = 0.151); there is a significant decrease in VHN of Xtrabase (p = 0.033) and Quixfill (p = 0.006) after 14 days. Grandio showed the highest VHN at 1st (77.79 ± 4.07) and 14th days (99.7 ± 1.53) and there is a significant increase in VHN after 14 days (p = 0.008).

Conclusion: Bulkfill composites could be an alternative to nanohybrids/siloranes; and bulk-filled flowable restorations may be a viable when occlusal layer is constructed with high inorganic content composites in posterior restorations.

P265
Alternatives on Surface Treatment to CAD Glass Ceramics
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Aim: The aim of this study was to evaluate two surface treatments as an alternative to HF acid etching on the bond strength of two luting resins on CAD ceramic.

Material and methods: Sixty CAD ceramics were divided into three groups according to the surface treatments such as HF acid etching (n = 20), laser treatment (n = 20) and Tribo chemical coating process (n = 20). Then all specimens were divided into two subgroups according to luting resins such as Maxcem Elite and Biscem. Following the cementation procedure, all specimens subjected to 10,000 cycles of thermocycling. Shear bond strength was measured by use of Zwick Z010 universal testing machine until failure. One-way ANOVA, Tukey HDS and Student t-test were used for determination of the statistical significance of the differences between the mean shear bond strength values.

Results: According to surface treatments, the highest bond strength was obtained with the groups treated with HF acid etching. There was no statistical differences between laser and Tribo chemical coating process. According to resin cements, in all groups there was no statistical differences between Maxcem Elite and Biscem resins.

Conclusion: Although HF acid etching is still the most effective method used, Tribo chemical coating process seems a good alternative on surface treatment of CAD ceramic system.

P266
Comparative Experimental Tests for Mechanical Properties of Different Types of Dental Space Maintainers
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Aim: Usually, after premature loss of temporary teeth, are applied space maintainers, so it is important to know the mechanical properties of the appliances and to observe their behavioral response to the forces developed in oral cavity.

Material and methods: The study determined, by static tests, the fracture strength of four types of space maintainers, fixed and removable, applied on four samples realized with human teeth extracted for orthodontic purposes. The forces, of maximum 3kN, were applied with a charging speed of 5 mm/min, by a special testing machine, with an innovative appliance. Experimental determinations included two aspects: to determine the maximum force that can be support by each sample, and to observe model deformation.

Results: For each sample were obtained diagrams of force variations in kN depending on the stain (in mm) vs. time (in seconds). So, for first sample, fixed appliance, according force applied, the chart is redrawn to deformation (0.04kN). For the removable space maintainer, the diagram is an ascending one according to force applied (0.42kN), until the fracturing moment; this was the type of space maintainer that had the weakest response to maximum force.

Conclusion: The values obtained indicate that the best option in terms of behavior under the conditions specified is the removable appliance, and the less functional version is the fixed space maintainer using brackets. Also, the fracture strength was more important for fixed space maintainers (band and loop) so, in practice is using more frequent these types of space maintainers.

Theme: Dental Treatment & Restorative Dentistry: Pedodontics

P267
Awareness of TMJ Disorders Among Pediatric Dentists
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Aim: TMJ disorders have generally been presumed to be conditions affecting only adults; however, epidemiological studies have reported signs and symptoms in children and adolescents to be as frequent as in adults and the prevalence varies widely in the literature from 16% to 90%, in clinical studies. This aim of this study was to evaluate the diagnostic procedures of pediatric dentist used to assess signs and symptoms of TMJ disorders and treatment methodology in children and adolescents.

Material and methods: A self-designed questionnaire included questions about routine dental examination and diagnostic methods of TMJ disorders was given to pediatric dentists to evaluate the clinical approaches to the TMJ disorders of children.

Results: The results of this study emphasize that pediatric dentists rarely interested in TMJ disorders in children. This is because of the multiple etiological factors contributing to TMJ disorders of rapidly growing patient besides to the cooperation problems and difficulties associated with MRI imaging phobias of children.

Conclusions: The current perspective regarding TMJ disorder is multidimensional, with an appreciation that a combination of physical, psychological and social factors may contribute to the overall presentation of this disorder. Pediatric dentist should be aware of TMJ disorder in children.
P268
Fiber Posts Treatments on Severely Damaged Endodontically Treated Teeth in Children

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Objective: Endodontically treated teeth with insufficient tooth structure due to traumatic injuries or caries are often restored with crowns. But knowing prosthetic failure has been cited as the most common cause of failure in endodontically treated teeth, for children it is preferable to restore the teeth with posts. The aim of the study was to reconstruct endodontically treated teeth with insufficient tooth structure by using glass fiber posts due to trauma or caries in children.

Materials and method: Severely damaged endodontically treated maxillary incisors were reconstructed using glass fiber posts and direct resin composite systems in six patients who had trauma history or caries. Patients were examined clinically and radiographically every 3 months.

After 1 year clinical and radiographic follow ups all fiber posts were intact and no signs of root fractures, post fractures and post dislodgement were observed.

Results: Fiber posts could be an alternative treatment option in the restoration of severely damaged endodontically treated teeth because it fulfills all of the requirements necessary for clinical success with good esthetics. It conserves remaining tooth structure and could be completed in a short term and cheaper treatment than prosthetic restorations.

P269
Developmental Enamel Defects and Dental Treatment Conditions in Cardiac Children

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Objective: The aim of this study was to determine developmental enamel defects and their treatment conditions in children with Congenital Heart Disease (CHD) by comparing them with a control group of healthy children.

Methods: Children included in the study were referred to pediatric dentistry for dental examination and treatment after undergoing routine examination in pediatric cardiology clinic.

Results: The CHD group included 72 children, and the control group included 56 healthy children. Children ages 3–14 were included in this study. The mean age of CHD group and control group was 6.24 (±2.85 SD) and 6.73 (±3.01 SD), respectively. The mean dmft and DMFT values in CHD group were 2.80 (±3.77) and 0.81 (±1.63), respectively. In the control group, they were 1.87 (±3.31) and 0.72 (±1.46), respectively. The care index for primary teeth was 3.6% in CHD group and 13.3% in the control group. The enamel defect was detected in at least one permanent tooth in seven out of 72 children (9.7%) in the CHD group and in three out of 56 (5.3%) in the control group.

Conclusion: Although there was no significant difference in the development of dental caries or the prevalence of enamel defects between children with CHD and healthy children, the care index was low in children with CHD. In addition, children with CHD had a higher rate of pulled primary teeth and delayed treatment of decayed teeth.

P270
In-Vitro Bond Strength of a Flowable Compomer to Dentin

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Aim: The study aimed to investigate the impact of different restorative techniques on the micro-tensile bond strength (μTBS) of a flowable compomer used in primary teeth.

Materials and methods: Occlusal surfaces of 30 extracted primary molar teeth were cut to expose a flat dentin surface and abraded with wet 600-grit silicon carbide paper to evaluate μTBS of materials. Specimens were randomly divided into three groups for restoration: Group 1, compomer (Glassionite, VOCO GmbH, Cuxhaven, Germany) filling alone; Group 2, flowable compomer (Twinky Star Flow, VOOC GmbH, Cuxhaven, Germany) lining/pre-cured and overlaying compomer; and Group 3, flowable compomer lining/over-cured with overlaying compomer. Specimens were stored in distilled water at 37°C for 24 h and tested for μTBS (1 mm/min) using a micro-tensile testing machine (Micro Tensile Tester, T-61010 Ki, Bisco, Schaumburg, USA). Failure modes were determined under a stereomicroscope. μTBS results were analyzed using the Kruskal–Wallis H test. A p-value of <0.05 was considered statistically significant.

Results: Compomer showed higher bond strength (15.3 MPa) than pre-cured flowable compomer (10.6 MPa) and co-cured flowable compomer (14.5 MPa); however, there was no statistically significant difference between the groups (p > 0.05). Mixed cohesive failure of both adhesive and dentin was the most common failure type in all of the groups (73.3% in Group 1 and 53.3% in Group 2).

Conclusion: Flowable compomer with different restorative techniques showed similar bond strength to dentin with compomer.

P271
Postoperative Discomfarts in Children After Dental Rehabilitation Under General Anesthesia with Nasotracheal Intubation

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Purpose: The objective of this study was to determine the postoperative discomfort in the first 24 h following dental care under...
general anesthesia (GA) with nasotracheal intubation using sevoflurane in healthy children.

Materials and methods: Twenty six premedicated patients with high dental fear (Score I according to Frankl scale) underwent GA for their dental treatment. Nasotracheal intubation was used for GA in the dental treatment of young anxious children. They were given anesthesia maintained with sevoflurane (2–3%) after receiving inhalation induction either with sevoflurane (8%). The patients’ age, gender, type of dental treatment, and duration of anesthesia and operation were recorded from the inpatient service. Other postoperative morbidities, which include crying, nausea and vomiting, bleeding, and drowsiness, were also noted for 24 h after the operation.

Results: The mean age of patients was 6.38 (SD 1.06) years and their ages ranged from 5 to 8 years. There was no significant difference among genders. Minor post-operative symptoms, such as pain, bleeding and nausea, have been reported to occur frequently in immediate period. Of the 26 participants, approximately 62% and 47% had preoperative and post-operative discomfort, respectively. Immediately discomfort was influenced by number of extraction.

Conclusions: Bleeding following dental treatment under general anesthesia was the most prevalent symptom of postoperative discomfort in this study. Moreover, children undergoing dental rehabilitation under general anesthesia commonly experience pain, agitation, sleepiness, nausea and vomiting.

P272
Abnormal Maxillary Central Diastema Treatments Caused by Mesiodens
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Aim: Mesiodens in primary or mixed dentition period cause many clinical anomalies, such as delayed eruption of permanent teeth, root resorption of successor permanent teeth, abnormal maxillary central diastema, etc. Many treatments for closing abnormal central maxillary diastema have published with their advantages and disadvantages. The aim of these study was to evaluate many treatments for closing abnormal maxillary central diastema caused by mesiodens.

Conclusion: The treatment using bracekt and safety pin resulted reciprocal and controlled force, thus maxillary central incisives had moved bodily in closing abnormal maxillary central diastema.

P273
Treatment of the Uncomplicated Crown Fracture Using Natural Tooth Structure: Three Case Reports
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Introduction: Epidemiological researches dental traumatic injuries were widespread in the population and are a frequent pathology among children and teenagers. Crown fractures in 10 years-old population is considered a real and serious public health problem owing to the high prevalence and leading serious problems that can affect social relationship. The most common is uncomplicated crown fracture without any pulp exposure. Recent developments in restorative materials and adhesive techniques allow clinicians to predictably restore fractured teeth. If the original tooth fragment is retained following fracture or is kept by patient in suitable conditions, the natural tooth structures can be reattachment using adhesive protocols to ensure reliable strength, durability, and aesthetics.

Case: The aim of these reports were to present treatments of traumatized maxillary anterior central incisors, in three different cases, with reattachment of natural tooth structures and their periodical follow-up.

P274
Oligodontia, Ectrodactyly, Syndactyly Associated with Maternal Acetazolamide: A Case Report
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Introduction: Oligodontia is a severe type of teeth agenesis involving six or more congenitally missing teeth. Oligodontia has been classified as isolated or non-syndromic and syndromic hypodontia. The causes might be attributed to environmental or factors, or to both. Acetazolamide is a Carbonic Anhydrase Inhibitor and its use in pregnant women has not been recommended because of reported teratogenic risks. Congenital malformations such as ectrodactyly, syndactyly, cleft lip and retarded incisor teeth development have been reported in experimental animals.

Case: Although there is no convincing evidence for an adverse effect for acetazolamide use in human pregnancy, this case report described a case of 11-year-old Saudi boy who was exposed to a maternal acetazolamide (1000 mg/day) for the treatment of the benign intracranial hypertension during the first trimester and beyond which might resulted in ectrodactyly, syanodactyly, and possibly oligodontia.

P275
Methods of Deciduous Dental Pulp Research
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Aim: The aim of our study was to evaluate the condition, particular structure and properties of the pulpal tissue by using various methods.

Material and methods: The pulps used for this research had originated from intact teeth of healthy children, (five deciduous teeth without, and five deciduous teeth with physiological resorption).
Immediately after the extraction (performed due to orthodontic reasons, under local anaesthesia), each tooth was cut perpendicularly to its long axis with a rotating carborundum disc under a water jet. The separated halves were dissected with plastic instrument, and the tooth pulp was excavated completely.

**Results and discussion:** The extracellular matrix is the major constituent of the connective tissue. This is composed of ground substance and fibrillar proteins. The main cells of the connective tissue are the fibroblasts. The pulp also contains odontoblasts (the highest differentiated cells), undifferentiated mesenchymal cells, and immunocompetent cells (lymphocytes, macrophages, leucocytes).

Adequate pulp preparation has always been a challenge, because artefacts resulting from inadequate fixation often are described as evidence of pathosis. Methods with dropping a tooth in a jar of formalin, even if done immediately after extraction, are inadequate to permit subsequent critical examination of the dental pulp. Other methods are with section the apical 2–3 mm of the root with a fissure bur, and an opening was made into the pulp chamber with a round bur and fixed with 10% buffered formalin.

**Conclusion:** The developments of models are needed for better investigation of deciduous dental pulp, but also for better her preservation.

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**P276**

**Caries Management of Young Children Using Their Mother's Cariogram Data**

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*Aso Kids Dental Park*

**Aim:** The aim of this study was to compare the caries risk profiles obtained from the modified Cariogram model for under 3-year-old Japanese children and the conventional Cariogram model for their mothers for improving the caries predictive ability in young children.

**Materials and methods:** Data required for a caries risk assessment with Cariogram at the first visit were collected from 55 pairs of mother and child.

The modified Cariogram was produced with exclusion of lactobacilli count, salivary secretion rate and buffering capacity for young children. These pairs were divided into two groups by child’s age at first visit, the one was under 1.5-year-old children group (U1.5, n = 25) and another was over 1.5-year-old group (O1.5, n = 30).

Their data were compared for each caries-related factor by statistical analysis.

**Results:** There was no significant difference between two groups, except for the child’s caries experience ($p < 0.05$). In U1.5, significant correlations were detected between mother’s and child’s diet frequency ($p < 0.05$), mother’s availability of fluoride and child’s amount of plaque ($p < 0.05$) and mother’s salivary secretion rate correlated with both of child’s chance of avoiding caries and diet frequency ($p < 0.05$). Also there was significant negative correlation between mother’s DMFT and child’s diet frequency ($p < 0.05$).

**Conclusions:** There results suggested that mother’s Cariogram data might be able to complement the caries prediction of her child in his/her early childhood.

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**P277**

**Dental Students’ Perception of Pre-Clinical Practice in Pediatric Dentistry**

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**Aim:** The aim of this study was to identify the dental students’ perception of the change of practice form in pediatric dentistry prior to clinical training performed by 4th-year dental students in Japan.

**Materials and methods:** An anonymous questionnaire survey was conducted and the differences between the students in 2011 ($n = 123$) and 2003 ($n = 117$) were examined in terms of the influence of “increase of the number of the practice subjects,” “introduction of the preliminary assignment” and “changes of the practice form” for the 4th-year dental students in 2010 ($n = 130$). The differences in the students’ perceptions were statistically analyzed.

**Results:** Valid response rates of 100%, 94.6% and 100% were recorded for the students in 2003, 2010 and 2011 respectively. On the content of “topical application of fluoride,” significant differences were found in two questionnaire items, “difficulty for practice” and “propriety of practice time,” between the 2003 group and the 2010 ($p<0.001$). More than 95% of the students in each group were satisfied with their dental educators.

**Conclusions:** It was confirmed that the students’ degree of satisfaction with the practice was maintained however the contents were increased without longer overall practice time. It was suggested that the practice is attained more efficiently by considering the students’ practice evaluation.

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**P278**

**Evaluation of Family Awareness on Bruxism in Mixed Dentition**

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**Aim:** During sleep, awareness of tooth grinding (as noted by sleep partner or family members) is reported by 8% of the population. Sleep bruxism is a behaviour that was recently classified as a ‘sleep-related movement disorder’. Because of this, sleep bruxism is a condition that is really difficult to diagnose. Polysomnographic tests and masseter muscle activity measurement devices are used to diagnost sleep bruxism. However, their results are only valuable when the patient makes active grinding and clenching. If the patient doesn’t have bruxism all the nights, these tests may not be reliable. Also tooth wear is not accepted as a diagnostic criteria
for bruxism. Hence, the parental observation is accepted as the most reliable method to diagnose sleep bruxism.

**Material and methods:** In this study we applied a survey to the parents of patients who approved to Department of Paediatric Dentistry, Faculty of Dentistry, Universtity of Gazi. Then the results evaluated. If the parents answered the question ‘does your child make grinding or clenching when he/she sleep’, negatively; we advised parents to sleep with their child for a week.

**Results:** We noticed that parents are generally controlling their children during sleep. Also many of them are aware of sleep bruxism.

P279

**Clinical Monitoring of MIH by Novel Light Induced Fluorescence Systems**

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**Background:** The Light Induced Fluorescence System is based on an innovative approach quantifying enamel health called Fluorescence Enamel Imaging. Enamel is both highly mineralized and semi-translucent. Because of its mineral composition, enamel will fluoresce when exposed to certain light wavelengths. The semi-translucent nature of enamel results in different enamel densities emitting different levels of fluorescence. As a result, with FEI technology, one can measure the density of tooth enamel by measuring its fluorescence when subjected to specific light wavelengths. The fluorescence image of enamel with incipient lesions can be digitized and then the fluorescence loss in the lesion can be quantified. Changes in fluorescence radiance and lesion area can be followed in time to measure lesion development. Real-time fluorescent images are captured into the computer and stored in an image database. The objective of this clinical study is to determine the ability of visual and instrumental procedures to monitor MIH lesions by Novel Light Induced Fluorescence Systems.

**Methods:** The study comprised children with Molar-Incisor Hypomineralisation (MIH), at the Department of Pediatric Dentistry, Marmara University. Ten patients with MIH was diagnosed by visual MIH scale and by Light Induced Fluorescence Systems. The equipment, the data processing and the interaction between equipment and operator were described.

**Results:** Fluorescence loss integrated over the lesion area (deltaQ; deltaF × A; % × mm²), were determined and compared with MIH scale results.

**Conclusion:** These preliminary data from an ongoing clinical study suggest that measurements with FluoreCam is able to monitor MIH. It also provides visual and quantitative feedback to patients.

P280

**Postoperative Discomforts Related to Oraltracheal Intubation for Dental Rehabilitation Under General Anesthesia in Children**

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**Objective:** The aim of present study was to assess the postoperative adverse events in the first 24 h following dental care under general anesthesia (GA) with oral intubation in anxious children.

**Materials and methods:** Sixty premedicated patients who are unable to cooperate, incompatible and have high dental fear (Score according to Frankl scale) underwent GA for their dental treatments. The children were orally intubated for the treatments under GA. Sevoflurane with 2% and 8% were given to induction and maintain in anesthesia, respectively. The patients’ age, gender, type of dental treatment, and duration of anesthesia and operation were reported from the impatient service. Other postoperative complications, which include crying, nausea and vomiting, bleeding, and drowsiness, were also noted for 24 h after the operation.

**Results:** The mean age of patients was 5.78 (SD 0.98) years and their ages ranged from 2 to 11 years. There was no significant difference between genders. Minor post-operative discomforts, such as pain, bleeding and nausea, have been recorded to occur frequently in immediate period of the 60 participants, approximately 60% and 55% had preoperative and post-operative complication, respectively. It was found that there was a positive relation between number of extracted teeth and post-operative discomfort include of pain and bleeding.

**Conclusions:** The results of present study demonstrated that the most common complaint after dental treatment under general anesthesia was bleeding. Also, children frequently experience daporation, sleepiness, pain, nausea and vomiting.

P281

**Effects of Oxalate and Tri-Calcium Phosphate Gels on the Primary Teeth Dentin Permeability: A Pilot Study**

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**Objectives:** The aim of this study was to evaluate the effects of oxalate and tri-calcium phosphate fluoride gels to the permeability of extracted primary molar teeth with a new system with photo-sensors.

**Materials and method:** This study was approved by the Research Ethics Committee. A total of 20 non-carious primary molar teeth with 1/3 root resorption, which were with no restoration, fracture or crack were selected and randomly divided into two groups. Similar cavities were prepared on the coronal segment of teeth using diamond fissur bur and placed in the electronic hydraulic conductance measurement system. The dentine permeability (Lp) of each specimen was measured before and after the application of
oxalate and tri-calcium phosphate. The amount of distilled water passed through each dentin disk ($\mu l$/min) under a constant pressure (50 cmH$_2$O) was determined. Dentin permeability data of the teeth were recorded and analyzed statistically.

**Results:** The dentin permeability respectively presented significant decrease after the application of oxalate and tri-calcium phosphate fluoride gel ($p = 0.015$, $p = 0.024$, $p < 0.05$)

**Conclusion:** Topical application of oxalate and tri-calcium phosphate gels leads to a decrease the dentine permeability in the primary molar teeth as observed in the present study.

P282

**Prevalence of Dental Anomalies in Turkish Population**

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**Objectives:** The aim of this study was to determine the prevalence of dental anomalies in Turkish dental patient population with respect to gender and age.

**Methods:** A retrospective study was performed using panoramic radiography of 2025 patients attending Istanbul University, Faculty of Dentistry, Department of Oral Radiology between the ages 3–86. All data were analyzed for hypodontia, hyperdontia, taurodontism, microdontia and root anomalies.

**Results:** Among 2025 patients, 885 (43.7%) were male and 1140 (56.29%) were female with the mean age of 36.61. Hypodontia was the most common dental anomaly (1.77%) which is more prevalent in females (63.88%). 1.18% of the patients had taurodontism and 62.5% of them were male. Hyperdontia was determined in 0.79% of the patients. Microdontia (0.54%) and root anomalies (0.44%) occur less frequent according to our results.

**Conclusion:** Hypodontia is the most common dental anomaly followed by taurodontism and hyperdontia.

P283

**Preference of a New Colored Compomer Material in Children**

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**Objective:** The purpose of this study was to evaluate the clinical performance of a new colored flowable compomer material in primary molars and the effect on the pleasantness of the child patient.

**Materials and methods:** Our study was designed as split-mouth. One hundred class I and V restorations were placed in a total of 50 child patients. A newly developed flowable compomer materials (Twinky StarFlow, Voco, Germany) was placed on 50 primary molars and a compomer restorative material (Dyract extra, Dentsply, USA) was used as a control. Behaviour assessment of each child was done using Frankl’s behaviour rating scale at the beginning of treatments. All children were exposed to live modelling and tell-show-dobehaviour management technique while having their treatments. Modified facial image scale was used to determine the dental anxiety before and after treatment. The children were asked to point at which face they felt most like at that moment.

**Results:** Colored flowable compomer material (Twinky Star, Voco, Germany) was preferred by the patients more frequently 86% ($p < 0.005$). Female and 5–6 years old patients were the most pleasantness group to the colored fillings in our study.

P284

**Multidisipliner Treatment of an Immature Tooth with Cervical-Root Fracture: A Case Report**

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**Introduction:** Cervical root fracture of a tooth below the gingival attachment presents a very difficult restorative problem and have a worse prognosis compared with other root fracture types. Orthodontic extrusion of such teeth allows elevating the fracture line above the epithelial attachment and so the proper finishing margins can be prepared.

**Case:** The aim of this case report is to move the tooth to supracrestal position and to maintain the healty periodontium in a maxillary lateral incisor. In this case, following the removal of the epithelial attachment on the root surface, apexification procedure and orthodontic extrusion was initiated. Then the root was filled with MTA (Mineral Trioxide Aggregate) and esthetic coronal restoration was made using FRC (fiber reinforced composite).

**Theme:** Dental Treatment & Restorative Dentistry: Periodontics

P285

**Diode Laser in Treatment of Chronic Periodontitis**

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**Aim:** The aim of this study was to compare the effect of conventional non-surgical treatment by scaling and root planning – SRP to treatment by SRP and additional application of diode laser (808 nm) in patients with moderate chronic periodontitis.

**Materials and methods:** The study involved 40 patients with chronic periodontitis – moderate degree. Patients were divided into two groups. The first group included 20 patients to whom the procedure SRP has been performed – control group (no adjunctive treatment). The second group included 20 patients with the same treatment and additional application of diode laser (808 nm) – test
group. In both groups the treatment has been applied in four visits twice a week.

The clinical parameters of Papilla bleeding index, Hygiene index, Bleeding on probing, Probing pocket depth and Clinical attachment level were measured at baseline and 1 month after treatment.

Microbiological testing for periodontal pathogens and immunological detection of IL-6 levels in gingival exudate were conducted before treatment and 1 month after treatment completion.

Results: One month after treatment all groups showed significant improvements with regard to all clinical parameters compared to baseline. The test group with additional application of diode laser have better clinical and laboratory parameters compared to the control group.

Conclusions: Application of diode laser in addition to conventional treatment of patients with moderate chronic periodontitis have a beneficial effect.

P287
Clinical Effectiveness of Photodynamic Therapy in the Treatment of Chronic Periodontitis
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Aim: The aim of this study was to assess the effect of adjunctive photodynamic therapy (PDT) in the mechanical treatment of chronic periodontitis patients.

Material and methods: Twenty systemically healthy non-smoking patients with untreated chronic periodontitis were included. All teeth received mechanical periodontal treatment comprising oral hygiene instruction and scaling/root planing. Using a split-mouth design, three quadrants (test groups) were additionally treated with various modes of FDT. Plaque index (PI), gingival index (GI), probing depths (PD), relative attachment levels (RAL), bleeding on probing (BOP) were assessed at baseline and 3 months after treatment. The study was approved by the Institutional Review Board of Health Sciences of Marmara University.

Results: No significant differences were found in any of the clinical parameters at baseline between the groups. PI, GI, PPD, RAL and BOP showed significant reduction 3 months after the treatments in all groups (p < 0.001). The intergroup difference was not significant in any clinical parameters (p > 0.05).

Conclusion: Within the limits of this study, no significant adjunctive effects of the FDT were detected in the mechanical periodontal treatment of chronic periodontitis patients.

P288
Clinical Evaluation of Non-Surgical Periodontal Treatment in Generalized Aggressive Periodontitis
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Aim: To evaluate the clinical outcomes of non-surgical mechanical periodontal treatment in generalized aggressive periodontitis (GAgP) patients.

Material and methods: Eleven patients (19–36 years of age; mean 30.55 ± 5.96) diagnosed as GAgP in the Department of Periodontology, Marmara University were included in the study. All subjects were treated at four sessions with 1 week intervals without using any antimicrobials. Oral hygiene instructions and supragingival debridement were repeated every 2 weeks during the first 3 months and every 4 weeks during the last 3 months. Plaque index (PI), gingival index (GI), probing depth (PD), bleeding on probing (BOP) and clinical attachment level (CAL) were recorded at six sites per tooth at baseline and after 3 and 6 months. Patients were instructed not to use any systemic and/or local antimicrobials during this period. The study design was approved by Yeditepe University Clinical Research Ethics Committee (2012-257).

Results: All clinical parameters showed a significant (p < 0.05) improvement at 6 months post-treatment. The whole-mouth PD
Gingival recession is defined as the displacement of the soft tissue margin, apical to the cement-enamel junction, and its coverage is one of the most challenging procedures in periodontology. Periodontal plastic surgery techniques aim to reach the ideal result by root coverage and at the same time enlarging attached gingiva. There are many surgical techniques serving this purpose. In this case series, we applied laterally positioned flap technique with secondary healing of the donor area to treat five isolated gingival recession localized in different regions.

**Method:** Five female patients applied to our clinic with gingival bleeding and isolated gingival recession complaint in different regions. After clinical and radiographic examination and following initial periodontal treatment, laterally positioned flap technique was performed in order to cover gingival recession and regain attached gingiva. In all cases, full thickness pedicle flap technique used and positioned to the laterally recession area. The donor site left for secondary wound healing.

**Result:** At the end of 12–18 month healing period, appropriate attached gingiva that could prevent mucogingival stress and facilitate oral hygiene was achieved and it was observed that denuded root surfaces was partially covered.

**Conclusion:** In this case series, we observed that laterally positioned flap can be used for rehabilitation of mucogingival problems. And in our clinical observation, secondary healing time of the donor area was approximately 1 month.

**Introduction:** Root resorption is the process of the removal of cementum and/or dentine through physiological or pathological activity of tooth resorbing cells, which may be called dentoclasts. There are two types of tooth resorption: internal and external resorption. Invasive external root resorption is entirely uncommon entities and the etiology is poorly understood. This case report shows the unique clinical and radiographic appearance of the presence of a large external inflammatory resorption due to endodontal-periodontal origin and its successful management.

**Case:** A 45-year-old patient was referred to our clinic with swelling and discolorization on his upper right central incisor. Radiographic examination shows irregular radiolucency over the coronal one-third and it extends subgingival area towards the external invasive resorption. The probing depth of the tooth was 7 mm in the centre of the bucal area after non-surgical treatment. As the defect was on the subgingival area, surgical intervention was planned. Incision was given and full thickness flap was reflected. A circular resorptive area was cleaned. During surgery root canal treatment and defect obturation with amalgam were done. Clinically and radiographically the tooth was asymptomatic without any side effect of amalgam filling, and no periodontal pocket was found after 6 months follow up.

**Conclusion:** In summary, this case report shows that large external resorptions could treated successfully with careful case selection.
**P292**

**Immuno-Microbiological Characteristics of “Radent” Filler Material in Treatment of Chronic Apical Periodontitis**

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**Aim:** The purpose of the research is to study the composition of microflora, the number of leukocytes in tooth root canal under chronic apical periodontitis (CAP).

**Material and methods:** The analyses of microorganisms composition in teeth root canals (RC) was carried out with bacteriological method.

**Results:** The analyses of microorganisms composition in teeth root canals (RC) was carried out with bacteriological method. Concentration of protein in RC contents was determined with biuret method. Temporary RC filling material “Radent” (Ca(OH)₂ and ZnO) prepared in 1% solution of chlorhexidine (index group, 25 people) and krezodent (control group, 10 people) were used for treatment of CAP.

**Conclusion:** The research shows that the pathological process in the periodontium in CAP is mainly supported by coccal and anaerobic flora. “Radent” in clinical settings inhibits the development of streptococci, Candida, enterobacteria and anaerobic flora. Control had the growth of Candida, pyogenic streptococci, staphylococci and predominance of anaerobic flora. “Radent” significantly reduced the severity of leukocytosis in RC from 29133.3 ± 4008.2 till 13733.3 ± 2673, 4 per 1 µl (p < 0.05); krezodent does not have a similar effect (37600.0 ± 9431.9 per 1 µl; p > 0.05). The protein content is also significantly reduced in the index group when compared with same rate in the control (from 8.05 ± 0.89 till 2.92 ± 0.65 mg/ml, p < 0.05; control – till 5.72 ± 0.75 mg/ml, p > 0.05).

The research shows that the pathological process in the periodontium in CAP is mainly supported by coccal and anaerobic flora. “Radent” has a strong antibacterial effect, and by reducing the number of leukocytes and total protein an anti-inflammatory.

**P293**

**First Experience with the New Type of a Bioactive Glass in the Regenerative Therapy of Posterior Teeth in Chronic Periodontitis**

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**Aim:** A pilot, short-term study deals with author's first experience in regenerative surgical therapy of intraosseous periodontal defects done by an augmentation procedure using a new material prepared on the basis of so called bioactive glass.

**Material and methods:** The group of 10 individuals was treated regularly for chronic periodontitis. The therapy of persistant and recurrent periodontal intraosseous defects consisted of surgical regenerative procedure using bioactive glass material NovaBone for the augmentation of selected infrabony defects.

Clinical parameters were observed before and after the periodontal surgery. Values of the pocket depth, gingival recession, and loss of attachment were measured.

**Results:** The therapy led to significant improvement of clinical parameters in terms of the reduction of pocket depth and loss of attachment values.

**P294**

**Evaluation of Gingival Crevicular Fluid (GCF) Levels of LL-37 and Serum Vitamin D3 Levels in Smoker and Nonsmoker Patients with Chronic Periodontitis**

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**Purpose:** Cathelicidin LL-37, an antimicrobial peptide, is part of the host innate immune response in the oral cavity. The aim of this study was to evaluate; gingival crevicular fluid (GCF) levels of LL-37 and serum vitamin D3 levels and clinical parameters in smoker and non-smoker patients with chronic periodontitis (CP).

**Material and methods:** Plaque index (PI), gingival index (GI), probing depth (PD) and clinical attachment level (CAL) measurements, GCF and blood serum samples were collected from smoker (n:20) and non-smoker (n:20) patients with chronic periodontitis and periodontally healthy (n:20) control subjects. GCF levels of LL-37 were measured by Enzyme linked immunosorbent assay (ELISA) and serum levels of vitamin D3 were analysed by High-performance liquid chromatography (HPLC). The results were analysed statistically.

**Results:** GCF levels of LL-37 have been found significantly higher in CP groups than control subjects but no significant difference was found between smoking and non-smoking CP groups (p < 0.05). There was a positive correlation between GCF LL-37 and vitamin D levels in smoker CP group (p < 0.01). All clinical parameters were found correlated with GCF LL-37 levels (p < 0.01). PI, GI, PD, CAL measurements were significantly higher in CP groups than controls (p > 0.05).

**Conclusion:** Vitamin D can acts as a potent stimulator of LL-37 in GCF. Elevated levels of GCF cathelicidin LL-37 in chronic periodontitis suggest that it may play a role in the host innate immune response during periodontal inflammation.

**P295**

**Periodontal Involvement of Langerhans Cell Histiocytosis in a Young Man**

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Introduction: Langerhans cell histiocytosis (LCH) is a rare proliferative histiocytic disorder in which pathologic Langerhans cells accumulate in a variety of organs. The features of the disease are well described in children, but remain poorly defined in adults.

Case: We present a case of oral lesions and severe localized periodontitis associated with LCH in a 29 years old male patient who had been diagnosed with pulmonary LCH and applied systemic chemotherapy 7 years ago. Considering the patient’s clinical history, the patient who did not experienced recurrence of the lesions during first 5 years. But 2 years ago we revealed a new oral lesion and severe localized bone loss in anterior mandible and posterior maxilla. Gingival biopsies were taken under local anesthesia and investigated by using immunohistochemically. The patient received 500 mg amoxicillin and 500 mg metronidazol three times daily plus non-surgical periodontal therapy. Immunohistochemical findings confirmed that the cells are phenotypically related to Langerhans cells. Two-year after periodontal therapy, treatment resulted in reduction of probing depth and gain in clinical attachment level.

Conclusion: Clinical 2 years follow-up suggests that initial phase periodontal therapy may be beneficial for the treatment for severe bone destruction in a young man with LCH.
to 75 years-old were volunteered to participate in this study as test groups. The control group was consisted of 100 Caucasians volunteers with age range 21–66 years-old. Ethical committee approval was obtained from our University. In this comparative cross sectional descriptive and analytical study all patients were presented with natural incisors and canines. Measurements were performed to the width of the nostrils and the inner-canthus distance by digital caliper and compared to the width of the upper anterior teeth and to both the width of the upper two centrals and the philtrum respectively. Alginate impression were made to all patients. Two lines were made from the centre of incisive papilla to the facial surfaces of the central incisors another line was made to the tip of the left and right canines. The distance from midpoint of incisive papilla to these three lines were measured on study casts. Statistical analyses were performed using SPSS 16 software.

Results: The comparative results showed highly significant relations among comparative variables. No significant differences found among groups (p > 0.005).

Conclusion: Biometric guides are applicable to most ethnic origins. Thus, they are important clues to be used significantly in both clinical and lab procedures of complete denture construction.

P299
Color Changes of Polyamid and Polymethylmethacrylate Denture Base Materials
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Purpose: Both conventional and flexible resins may be shown color alteration due to intrinsic and extrinsic factors. The aim of this study was evaluated the color changes of the polyamid and heat polymerized acrylic denture base materials in storage different staining solutions.

Material and methods: Two denture base materials was used in this study. The specimens were stored in two staining solutions (tea, coffee), distilled water and denture cleaner. The color changes of specimens were evaluated before and after 7 and 30 days. After desiccation, the color of specimens was measured using a colorimeter. All data recording were taken by the same investigator to minimize inconstancy of technique. The data were analyzed statistically by repeated measures analysis of variance and Tukey honestly significant difference multiple comparison tests.

Results: It was found no statistically significant difference between solutions statistically (p > 0.05). Polyamid denture base resin displayed the greatest colour change when compared to Polymethyl methacrylate denture base resin (p < 0.001). Polyamid material indicated the highest value (ΔE: 7.28) in coffee solution for 7 days.

P300
Shear Bond Strength of Veneering Ceramic to Zirconia Core After Different Surface Treatments
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Objective: The aim of this study was to evaluate the effect of different surface treatments; sandblasting, liner and different laser irradiations on shear bond strength (SBS) of pre-sintered zirconia to veneer ceramic.

Material and methods: Two hundred specimens with 7 mm diameter and 3 mm height, pre-sintered zirconia blocks were fabricated. Specimens were randomly divided into 10 groups (n = 20) according to surface treatments applied. Group C; untreated (Control), Group E; Er:YAG laser irradiated, Group N; Nd:YAG laser irradiated, Group SB; sandblasted, Group L; liner applied, Group NL; Nd:YAG laser irradiated + liner applied, Group EL; Er:YAG laser irradiated + liner applied, Group NL; sandblasted + Nd:YAG laser irradiated, Group SE; sandblasting + Er:YAG laser irradiated, and Group SL; sandblasting + liner applied. Veneering porcelains were performed on zirconia blocks. Specimens before the experiment, 37°C are steeped in distilled water for 24 h. The thermal cycle tests were applied to the all specimens as 5000 cycle. Shear bond strength test was performed at a crosshead speed of 1 mm/min. The fractured specimens were examined under a stereomicroscope to evaluate the fracture pattern.

Results: Surface treatments significantly changing the topography of the Y-TZP ceramic according to SEM images. After different surface treatment, there was no difference in surface roughness of pre-sintered zirconia to compare after sintering, sintering enhanced the bond strength within the limitations of present study. The highest mean bond strength value was obtained in group SE and the lowest bond strength value was observed in NL group. Bond strength values of the other groups were similar to each other.
P303
Fracture Resistance of Teeth Restored with One-Piece Milled Aesthetic Post-Core Systems
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Purpose: Commercially available zirconia ceramic blocks and quartz fiber blocks specially produced by the manufacturer were used for the present study to compare the fracture resistance of teeth restored with one-piece milled post-core systems.

Materials and methods: Twenty extracted maxillary human canines were selected for this study. Teeth were decoronated at the cemento-enamel junction, endodontically treated and divided into two groups (n=10). After standart post space preparations, post-core patterns were produced using autopolymerizing acrylic resin pattern and they were scanned. Scanned data of each post-core models were transfered to the milling device and quartz fiber (RTD, St. Egreve, France) and zirconia ceramic (Vita In-Ceram YZ Disc, Vita Zahnfabrik, Bad Sackingen, Germany) post-core systems were manufactured. Following the cementation of the specimens they were compressively loaded in a universal testing machine until fracture. The results were analyzed by Student’s t-test.

Results: Compressive load test results were found to be statistically higher for the one piece milled zirconia ceramic post-core systems compared to the one piece milled quartz fiber post-core systems. Fractures that would allow repair of the tooth were observed in quartz fiber post-core systems, whereas mostly unrestorable, catastrophic fractures were observed in zirconia ceramic post-core systems.

Conclusions: The choice of a post material with a close elastic modulus to dentin could be an effective alternative for the restoration of the severely damaged endodontically treated teeth. The fabrication of one-piece, computer aided milled quartz fiber blocks could serve as a beneficial option for contemporary prosthetic restorations.

P302
Effect of Low-Temperature Aging on Flexural Strength of Monolithic Zirconia
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Purpose: The purpose of this in vitro study was to evaluate the effect of artificial aging on biaxial flexural strength and surface characteristics of different zirconia materials.

Materials and methods: Forty-eight zirconia disc-shaped specimens with 15 mm diameter and 2 mm thickness were prepared as three groups consisting of 16 specimens each as follows: (Gr 1) Bilayered zirconia (1 mm)-feldspathic (1 mm) (ICE Zirkon, Zirkonzahn); (Gr 2) Monolithic zirconia (2 mm) (Prettau, Zirkonzahn); (Gr 3) Monolithic zirconia (2 mm) (Cercon ht, Degudent). Half of the specimens for each zirconia group were randomly selected and assigned to artificial aging to simulate low-temperature degradation. Biaxial flexural strength was measured with a universal testing machine using piston-on-three-ball technique at a crosshead speed of 1 mm/min. Data were analyzed with one-way ANOVA and Tukey HSD tests (α=0.05). SEM analysis of fractured specimens was also performed on a representative sample from each group.

Results: Low-temperature aging adversely affected the biaxial flexural strength of bilayered and single layer zirconia groups tested (p<0.05). Monolithic zirconia groups exhibited higher strength values in comparison to bilayered zirconia group regardless of aging process whereas the difference between the mean flexural strength of tested groups was not statistically significant (p>0.05). The mean strength values of zirconia groups were ordered as follows: Cercon ht > Prettau > ICE Zirkon.

Conclusion: Low temperature aging process decreased biaxial flexural strength of monolithic zirconia. The results of this study indicated that monolithic zirconia shows comparable flexural strength to bilayered zirconia.
Materials and methods: Twenty one zirconia discs received three different surface treatments: group 1- sandblasting with 110 um aluminum oxide particles; group 2- silica coating (cojet system) and group 3- laser irradiation (CO2 laser). The ceramic discs were cemented to natural teeth by resin cement (RelyX Unicem). Scanning electron microscope was also performed to evaluate the surface morphology changes. Shear bond strength was recorded using a universal testing machine at a cross-head speed of 0.5 mm/min and expressed in megapascals (MPa).

Results: All groups yielded statistically significantly different roughness mean values: group 1 (219.00 ± 14.8 μm); group 2 (187.26 ± 10.72041 μm); group 3 (262.11 ± 31.675 μm) (ANOVA and Newman-Keuls test; p < 0.05).

Conclusion: Increasing surface roughness of zirconia ceramics using laser irradiation had no significant effect on the shear Bond strength. Sandblasting remains the most suitable and the easier method for enhancing the bond strength between zirconia ceramics and resin cement.

P305
Prosthetic Rehabilitation of Hemi-Mandibular Defect: A Case Report
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Mandibular defects may result from congenital or developmental abnormalities, accidental trauma, or acquired disfigurations resulting from removal of tumors during mandibular surgery in the oral cavity.

There are several treatment options available for rehabilitation in cases of partial loss of mandible including removable partial dentures, fixed partial dentures, crown and bridges, teeth-implant supported prosthesis, partial dentures with precision attachments. The prosthesis should replace all missing oral structures including both hard and soft tissues also function and esthetic. The appropriate treatment for the mandibular defects demands a multidisciplinary approach. This clinical report describes the prosthetic rehabilitation of a fractured mandible with hemi-mandibular defect caused by tumor surgery in a 60 years-old man. Prosthetic rehabilitation was obtained with a partial denture with extracoronal precision attachments.

P306
Complete Oral Rehabilitation with Overdenture Prosthesis of Four Young Sisters Suffering with Amelogenesis Imperfecta: A Rare Case
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Background: Amelogenesis imperfecta is a hereditary disease affecting the quality and quantity of enamel. Patients suffer from dental sensitivity, physiological problems and compromised esthetics.

These anamolies such as congenital tooth loss, anterior open-bite, calcification of pulp, dentin dysplasia, resorption of root and crown, hypersementosis in addition to irregular structure of enamel may be seen. There are four basic groups for amelogenesis imperfecta:
1. Hypoplastic type
2. Hypomaturation type
3. Hypocalcification type
4. Hypomaturation-hypoplastic type with taurodontism

Diagnosis: Clinical examination and genetic diagnosis are important. In these patients and their parents genetic identification has been still continuing.

Treatment: The conservative treatment choice is based on metal supported ceramic crowns but for this treatment, preparation design is usually destructive to tooth tissue.

This case report describes a noninvasive technique with overdenture prosthesis.

Patient and method: Clinical and radiological investigations were done and decreased vertical dimensions were observed. There were diastemas among teeth. Two sisters are twin and 11 years old, one of the others is 13 and the last one is 16. Firstly photographic and radiographic registrations were recorded. By removing of the undercuts without any invasive application to the teeth complete dentures were done according to the conventional procedures on the teeth. Vertical dimensions were improved. Esthetic and functional properties were gained to these sisters.

Conclusion: When the decreased vertical dimension is observed the prosthetic treatment is appropriate. In these patients complete dentures were done and not applied any invasive treatment. Results were satisfied fort the patients.

P307
Prosthetic Rehabilitation of an Edentulous Patient with Microstomia: A Clinical Report
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Introduction: Microstomia is defined as an abnormally small oral orifice. Microstomia can occur as a result of surgical treatment of orofacial cancers, maxillofacial trauma, burns, temporomandibular joint (TMJ) dysfunction syndrome, reconstructive lip surgery, radiotherapy, scleroderma and genetic disorders. Prosthetic rehabilitation of microstomia patients presents difficulties at all stages, from the impression procedure to the fabrication and insertion of prosthesis. The aim of this case report is to describe the prosthetic rehabilitation of an edentulous patient with microstomia.

Case: A 64-year-old edentulous man with microstomia induced by oral malign neoplasm presented to the Department of Prosthodontics for maxillary and mandibular complete dentures. The preliminary maxillary and mandibular impressions were made with alginate impression material and stock metal trays which were
diminished with burs to make fit into the mouth. Custom impression trays were fabricated using thermoplastic polyurethane pressure moulding material at thickness of 3 mm. Subsequently a medium body silicone impression material was used to make the definitive impressions. Maxillary and mandibular denture bases were prepared using the same moulding material and artificial teeth arrangement, the jaw relationship and try-in stages were evaluated intraorally using that kind of bases. Maxillary and mandibular prosthesis were processed in one piece, using heat-polymerized polymethyl methacrylate resin. The irritations were identified and eliminated during recalls.

**Conclusion:** For patients with limited opening, clinical dental procedures may be difficult. This article discusses the clinical impressions, jaw relationship, try-in procedure and denture design, using flexible custom trays and denture bases, suitable for a patient with microstomia.

**P308**

**An Investigation of the Bacteriological Activity of Denture Cleansing Products**

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**Objective:** To reduce infections, selection of appropriate denture base material and effective denture cleaning or disinfecting preparations are very important. In our study, we aimed to investigate the antibacterial activity of cleansing and disinfectant preparations currently use in Turkey.

**Materials and methods:** In our study, the antibacterial activity of three alkenen peroxide type cleaning denture effervescent tablets (Fittydent, Corega tabs, Protefex) frequently used in our country and two disinfectant solutions (Curaprox BDC 105 (weekly use), Curaprox BDC 100 (daily use), were tested on four types of denture base material samples (Vertex, Rodex, Molloplast-B, Meliodent) contaminated with *Staphylococcus aureus* ATCC 6538, *Pseudomonas aeruginosa* NCTC 6749 and *Bacillus subtilis* var niger ATCC 9372 at the contact times advised by the manufacturers.

**Results:** All of the preparations were found to be 100% effective against *S. aureus* ATCC 6538. Fittydent for 30 min, Corega and Protefex tablets for 15 min of each, and Curaprox BDC 105 for 6 h which was used during the week had the same activity (100%) against *P. aeruginosa* NCTC 6749. Otherwise, Curaprox BDC 100 was found 93–100% effective against *P. aeruginosa* NCTC 6749 for 5 min contact time. Fittydent (97–98%), Corega tabs (91–99%), Protefex tabs (68–95%), Curaprox BDC 100 (72–99%) and Curaprox BDC 105 (99%) have different disinfection effect against *B. subtilis* var. niger ATCC 9372. The effect of denture base materials on the cleaning and disinfection were very variable according to the kinds of bacteria present in the test environment.

**Conclusion:** Daily cleaning or disinfection of the dentures are effective methods to prevent bacterial contamination.

**P309**

**Clinical Marginal Gap and Internal Adaptation of CAD/CAM, Laser Sintering and Cast Metal-Porcelain Crowns**

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**Aim:** The aim of this study was to compare clinical marginal gap and internal adaptation of metal-porcelain crowns that were fabricated three techniques including CAD/CAM (CC), laser sintering (LS) and casting (C).

**Methods:** This study was approved by Ethical Committee of Faculty of Medicine (11-6/2), Ege University. Twenty CC, 20 LS and 20 C metal-porcelain crowns were fabricated for 42 patients. Silicone replica was obtained to measure marginal gap (a) and internal adaptation that was evaluated at three region including axial wall (b), axio-occlusal angle (c) and occlusal surface (d). Measurements were performed using computerized light microscope at 20× magnification. Measurements were analysed with one-way ANOVA and Bonferroni test (α = 0.05).

**Results:** Mean marginal gaps for groups CC, LS and C were 86.64, 96.23 and 75.92 µm, respectively. Mean measurements at region (b) for groups CC, LS, C were 117.5, 139.02 and 121.38 µm, respectively. There were no statistically significant differences for measurements at marginal gap (p = 0.082) and region (b) (p = 0.114) according to one-way ANOVA. Mean measurements at region (c) for groups CC, LS, C were 142.1, 188.12 and 140.63 µm, respectively, and at region (d) for groups CC, LS, C were 263.73, 290.39 and 201.09 µm, respectively. Mean values of group LS were significantly higher at region (c) and region (d) according to Bonferroni test (p < 0.05).

**Conclusion:** In this study, CAD/CAM, laser sintering and casting metal-porcelain crowns exhibited similar clinical marginal gap. Laser sintering crowns exhibited higher luting space at occlusal region.

**P310**

**Satisfaction of Removable Partial Denture Wearers Depending on Denture Design**

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**Aim:** Removable partial denture (RPDs) therapy is an acceptable form of treatment that provides an increased spectrum of restorative options: improving aesthetics, masticatory function, stabilizing dental relationships for partially dentate patients. The aim of this study was to evaluate patient’s satisfaction with RPDs retention, chewing ability, aesthetics, while wearing RPD in 5-year worn period.

**Material and methods:** A total of 64 patients with RPDs, participated in this study. It was examined 92 RPDs, 76 RPDs with
Dental Ethiology Triggering Pressure Dermographism: A Case Report

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Introduction: Prosthesis used for rehabilitation of missing teeth and surrounding oral tissues may cause complications like hypersensitivity, ulceration, pain etc. To the authors’ knowledge, there’s only one publication described the cases of dermatographism developed after dental procedure. Pressure dermatographism is a form of physical urticaria.

The present article described an unique case of pressure dermatographism appeared just after prosthodontic rehabilitation. Case: A 50-year-old female was treated with tooth retained overdenture in maxilla and implant retained overdenture in mandible. Chrom-cobalt framework and precision attachments with conventional methyl methacrylate denture base material was used for restoring the upper denture. Lower denture was made of chrome, cobalt and methylmethacrylate. She presented with erythema mucosal hyperplasia on the hard palate associated with burning sensation and bleeding following the dental treatment. Patient was referred to Dermatology Department before new prosthetic rehabilitation. No irritant reaction was observed after patch testing. However, red dermographic line of contact developed with small islands of edema. She was then tested for pressure urticaria with scratching. She was sensitive to touch and pressure, as well as scratching. The scratching lines were sustained for the 45 min of the consultation which proof the existence of chronic urticaria.

Conclusion: The purpose of the presentation was to draw attention to a possible complication of minimally invasive therapy outlining the complex role of the systemic etiologic factors. The key to successful prosthodontic treatment lies in a comprehensive treatment program that contains both finding out the etiological factor and eliminating the factor before or during the treatment.

Surface Roughness of Two Different Non-Precious Dental Alloy
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Objective: Surface properties of dental materials are of clinical importance since they may affect oral hygiene by reason of plaque accumulation. Especially in the case of all-cast or metal-to-acrylic veneer restorations, smoothness of metal surfaces become more important because large metal areas make contact with the oral tissues. The aim of study was to compare two different non-precious dental alloys investigating their surface roughnesses.

Methods: A Ni-Cr (Wirolloy®NB) and a Co-Cr (Wirobond®280) alloys suitable for all-cast restorations and crowns veneered with acrylic restorations were investigated. Disc shaped 10 samples were cast from each alloy. Finishing and polishing procedures were performed until obtaining clinically acceptable surfaces in accordance with the recommendations of manufacturer. Then samples were ultrasonically cleaned and dried at 60°C for 24 h. Surface roughness measurements were performed by profilometer (MAHR-PerthometerM1). Each measurement was repeated five times and mean arithmetic roughness values (Ra) obtained. Data for surface roughness were analyzed using ANOVA.

Results: Surface roughnesses of Co-Cr alloy samples (0.289 μm) were approximately three times greater than those of Ni-Cr alloy samples (0.096 μm). The differences in the means were also found statistically significant.

Conclusions: Overall Ra values ranged from 0.089 to 0.1026 μm for Ni-Cr alloy samples and from 0.27 to 0.3422 μm for Co-Cr alloy samples. The roughness of the Co-Cr samples tested indicates that there is a possibility for plaque accumulation, since the threshold value of 0.2 μm is considered that no further bacterial adherence can be expected below this value.

Impact of Frenulum Height on Strains in Maxillary Denture Bases
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Objective: The midline fracture of maxillary complete dentures is an often encountered complication. Assessment of the effect of frenulum height on midline strains of maxillary complete dentures.

Method and materials: A removable maxillary complete denture was fabricated and duplicated seven times. Four different labial frenulum heights were tested for stresses occurring on the palatal cameo surface. The strains were measured with strain gauges
placed on five different locations and the stresses were calculated. To mimic occlusal forces bilaterally 110 N of load was applied from the premolar and molar region.

**Results:** A statistically significant association between the height of the labial frenulum and the calculated stresses and strains was shown (p < 0.5) predominantly on the anterior midline of the maxillary complete denture increases with a higher labial frenulum.

**Conclusion:** Within the limitations of this in vitro study, it can be concluded that the stress on the anterior midline of the maxillary complete denture increases with a higher labial frenulum. Surgical or mechanical precautions should be taken to prevent short-term failure of maxillary complete dentures due to stress concentration and low cycle fatigue tendency at the labial frenulum region.

**P314**

**EDX Analysis in Evaluating the Conditioned Zirconia-Resin Cement Interface**

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**Objectives:** To evaluate the effect of surface treatment on bonding of zirconia with resin cement by Energy-Dispersive X-ray (EDX) analysis.

**Methods:** Two hundred bar specimens (N = 200, luted assemblies = 100) were prepared for four-point bending test (FPBT) from Y-TZP blocks (VITA In-Ceram YZ) and using two resin cements: Panavia F 2.0 (P); RelyX U-200 (R); and five surface treatments: control (C), airborne particle abrasion (Sh), zirconia primer (Z-Prime PLUS) (Z), glaze ceramic (Crystall Glaze spray) + hydrofluoric acid (GHF), fusion glass-ceramic (Crystall Connect (CC) (n = 10, each combination). After surface treatment, specimens were luted end-to-end, following each manufacturer’s instructions. FPBTs were performed in a universal testing machine (Autograph, Shimadzu, cross-head speed: 0.5 mm/min). Fracture type: adhesive (a), cohesive (c) or mixed (m) was determined by light microscopy (LM) (Eclipse ME600 Light Microscope); surfaces were then examined under environmental scanning electron microscopy (ESEM), verified by EDX analysis (Quanta 250 FEG SEM). Statistical analysis was by Chi-Square test.

**Results:** EDX analysis results for R (42% a, 8% c, 50% m) were compatible with ESEM and LM findings; while for P the results (18% a, 16% k, 66% m) were partially compatible for C, Z, and GHF. Elemental distribution gave different findings than by ESEM and LM.

**Conclusions:** EDX analysis provided supplementary information about fractured surfaces that can not be observed by light or scanning electron microscopy and can be recommended as a complementary chemical analysis method for interfacial evaluation of fractured surfaces.

**P316**

**Adaptation of Titanium Copings Fabricated by Electron Beam Melting**

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**Aim:** To compare marginal and internal fit of Ti-6Al-4V copings produced by casting, milling and electron beam melting (EBM).

**Methods:** On a master stainless steel model, 30 copings were fabricated for casting, milling and EBM; 10 for each of the three groups. Milling and EBM groups shared the same source of digital scanning (Nobel Procera). Copings fabricated by EBM were fabricated using ARCAM A2 machine in college of engineering at King Saud University. Marginal and internal gaps were measured on the master model by two techniques; volumetric measurements using Micro-CT and vertical marginal discrepancy (VMD) using a travelling microscope. Descriptive statistics and one-way ANOVA were carried out (p = 0.05).

**Results:** EBM copings showed the highest mean internal gap volume (76.54 mm³) followed by cast and milled copings (10.29 and
A Clinical Comparison of Cordless and Conventional Displacement Systems Regarding Clinical Performance and Impression Quality

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Aim: It is not clear whether newly introduced cordless displacement systems are better able to manage gingiva than conventional systems.

Purpose: To evaluate the gingival management ability of four different displacement methods with a standardized subgingival preparation finish line.

Material and methods: A subgingival preparation finish line of between 1 and 2 mm was ensured. Two hundred and fifty-two teeth were clinically assessed for ease of application, time-spent, bleeding, remnants, and dilatation. The complete reproduction of the preparation finish line and the bubble and void formations on polyether impressions were also evaluated. The data were statistically analyzed with the Chi-Square tests (p < 0.05).

Results: Statistically significant differences were found for all criteria among the groups (p < 0.05). The non-impregnated displacement cord group was the least effective group. The aluminum-chloride impregnated cord group and the displacement paste with cap group were found to be comparable in terms of remnants, dilatation, and impression quality. The retraction cap with paste group showed better results for ease of application, time-spent, and bleeding than the aluminum-chloride impregnated cord group. Although the aluminum-chloride impregnated cord, displacement paste, and cap application was found effective in terms of dilatation, bleeding, and impression quality, it was time consuming and difficult.

Conclusion: Except for the non-impregnated cord group, all of the groups were comparable and clinically useful, with perfect or acceptable impression qualities. When a 1–2 mm-deep subgingival preparation finish line is formed, the displacement paste and cap application may be the first choice, giving the benefits of hemostasis, time saving, and ease of application.

Effects of Immediate Provisional Restorations on Hard and Soft Tissues

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Aim: Our aim is to study the effects of immediate temporary prostheses, performed directly in the oral cavity, on the periodontal tissues.

Material: Examination instruments, periodontal probe, dental floss, crown remover, and periapical radiography.

Methods: 1. Periodontal and radiographic examination.
2. Examination of temporary prostheses (shape, thickness, surface...).

Results: • Para-gingival limits caused an augmentation of gingival inflammation and bleeding index.
• 4 weeks after temporary prostheses placement, an increase of the gingival inflammation was noted. After 2–3 months, a remarkable decrease of bleeding index was noticed. More than 3 months later, bone resorption, gingival inflammation and increase of the bleeding index were recorded.
• The non-compliance with the temporary prostheses can cause an increase of the bleeding index and bone resorption...

Conclusion: Provisional prostheses have several roles starting from preparation of abutment teeth to cementation of the final fixed denture. But, its incorrect shape can result in complications affecting the periodontium. Some complications can appear early in the first 4th weeks, others can be noted after few months.

Temporary prostheses fabricated chairside can be biologically submitted only if they respect the recommendations related to its technical achievement, global shape, polished surfaces...

This study confirmed that the immediate provisional restoration could be discussed because of the harmful effects of methyl polymetacrylate. Those effects are aggravated when temporary crown needs to be placed in the oral cavity for a long period. This leads us to be in favor of indirect provisional prostheses, whenever possible, in order to avoid any further complications.

An Alternative Prosthetic Treatment Option for Posterior Edentulous Mandible: A Case Report

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Introduction: Distal extension removable partial dentures (RPDs) are complex treatments because of the teeth and mucosa support. In order to avoid vertical, horizontal and torsional forces, load distribution for both tissues should be appropriate. Thus, the use of distal implants to support and retain RPDs has been reported in the literature to minimize dislodgement, improve esthetics and...
mastication, resulting in patient satisfaction in a cost-effective manner.

Case: This case report presents a 51 year-old man who lost whole mandibular posterior teeth except left first premolar tooth. Based on the clinical and radiological examination, excessive bone resorption observed in mandibular posterior region, particularly in the right posterior with a long interocclusal distance. It was decided to perform implant-supported fixed dentures by placing three implants both left and right mandibular posterior side. But; during the healing period, mesial implant on the right side was failed.

Because of patient’s implant loss, complications of implant-natural tooth connection and long interocclusal distance that causes excess material thickness of the metal and porcelain implant-supported removable prostheses, that allow retention by locator attachments to be connected to the implant, were performed on the rest two implants.

Conclusion: Implant supported RPDs can be an alternative for partially edentulous patients when an implant supported fixed prosthesis cannot be applied because of biomechanical, anatomical or economic reasons.

P320
Regulation the Pathways in Implant Retained Cranio Maxillofacial Prosthesis in Different Cases: Case Report
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Introduction: Implant retained CMF prosthesis can be made for the absence of the facial organs caused by trauma, congenitally and tumors. These prosthesis have some difficulties on their pathways. These pathways have to be reduced on choosen retention systems.

Case: In our cases we show some redesignings on the choosen retention system due to specialities of the cases.

P321
Age-Related Changes of Enamel, Dentin and Pulp Tissues of Premolars as Measured by Microscopy: Implications for Restorations
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Goal: Enamel, dentin and pulp tissues of premolars as well as their correlation with age is a significant factor in planning tooth reduction for restorations. This study examined variations in tooth enamel, dentin, pulp thickness and its correlation with age. These variations determine the tooth substrate available for restorations.

Method: Thirty-two human maxillary central incisors extracted from patients in the age range of 11–70 years were used to evaluate the thickness of tooth layers. The following tooth areas were measured by using stereo microscopy: facial and palatal enamel thickness at 1, 3, 5 and 7 mm above the cemento-enamel junction (CEJ), occlusal enamel thickness on buccal, palatal cups and central fossa, dentin thickness and pulp chamfer thickness at 1 mm above CEJ, pulp-occlusal enamel and dentin distance. The relationship between thickness and age was evaluated with regression analysis (\( \alpha = 0.05 \)).

Results: Significant differences (\( p < 0.01 \)) were observed in the relationships between the enamel thickness on palatal cup, pulp-occlusal enamel and dentin distance and age. These thicknesses decreased with age. The mean values of the facial enamel and palatal enamel thickness at 1, 3, 5 and 7 mm above the CEJ were 0.32 ± 0.09, 0.77 ± 0.25, 1.4 ± 0.21 and 1.52 ± 0.26 mm, and 0.41 ± 0.12, 1.01 ± 0.2, 1.54 ± 0.27 and 1.37 ± 0.37 mm, respectively.

Conclusions: Pulp–occlusal enamel and dentin distance, and enamel thickness on palatal cup decrease with age. Also the age-related decrease in pulp–occlusal enamel and dentin distance must be considered in tooth reduction.

P322
In-Vitro Assessment of Surface Characteristics and Bacterial Adhesion of Hypoallergenic Prosthesis Base Materials
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Aim: In this in vitro study, initial adhesion of oral streptococcus (S. mutans and S. sanguis) on commonly used conventional resin materials that are polymerized with heat (QC 20) or microwave (Acron MC) and three different hypoallergenic denture base materials (Puran HC, Alldent Sinomer and Polyan) was assessed.

Methods: Effects of material surface roughness on microbial adhesion were evaluated. Streptococcal adhesion was conducted on samples covered with saliva and without saliva. Considering these parameters, differences between initial bacterial adhesion of base materials were assessed by counting of bacteria in images which were taken with fluorescent microscopy of samples stained with acridine orange. Mann–Whitney U Analysis was used for pairwise comparisons and Kruskal-Wallis Variance Analysis was used to compare more than two independent groups. Correlation between variables was assessed with ANOVA Variance Analysis. Significance level was set at \( \alpha = 0.05 \).

Results: Statistically significant differences were also found among materials for surface roughness (\( p < 0.05 \)). Among rough group materials, highest mean surface roughness value (Ra) was found for Alldent Sinomer whereas lowest Ra was found for QC 20, a control group material. There was a strong positive correlation between roughness and the number of adherent bacteria of two groups (S. sanguis \( r = 0.882 \) and S. mutans \( r = 0.851 \)). It was found that pellicle decreased bacterial adhesion for all material samples (\( p < 0.05 \)).

Conclusion: In general, hypoallergenic base materials; Puran HC, Alldent Sinomer, Polyan and Acron MC showed higher tendency to microbial adhesion compared to conventional acrylic QC 20.
Adhesive Bridge Applications with Fibre Reinforced Composites (Report of Three Cases)

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Introduction: As an alternative to the traditional restorations in anterior single tooth deficiency, fibre reinforced adhesive bridges which are more preventive, timesaving and economical method have been produced.

Case: His article reports the restoration and long-term follow up of three cases of single tooth deficiency with Ribbond (Seattle, WA, USA) - a polylactic fibre composite- and pontics which are made of natural tooth and composite resins to the adjacent teeth.

Effect of Shading of Zirconium on Bond Strength to Porcelain
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Aim: The most common failure seen on restorations with zirconia core is total or layered delamination of the veneer porcelain. In this study, the shear bond strengths (SBS) between veneering porcelains and zirconium oxide core materials which were shaded by different liquids in two time periods were evaluated.

Material and methods: Zirconia discs (ICE Zirkon, Zirkonzahn) (15 x 12 x 1.6 mm) were divided into 11 groups of 12 discs each. Groups were shaded in the Vita Classic scale: A3, B1, C4, D2 or D4. Each group was treated with the recommended shading time for 3 s or prolonged shading for 60 s, except for the control group. Samples were veneered with translucent porcelain 3 mm in thickness and 3.5 mm in diameter (CZR, Noritake Co) and subjected to shear force in a universal testing machine with a cross-head speed of 1 mm/min. Repeated-measures ANOVA was used to analyze the data (time periods, zirconia core color). The Tukey HSD test and paired 2-tailed tests were performed for multiple comparisons (α = 0.05).

Results: The SBS between zirconia core discs and veneering porcelain were affected by time periods and zirconia core color (p < 0.05). Among the investigated 11 groups, C4 (3 s) had the highest bond strength with a value of 36.4 MPa while A3 (3 s) showed the lowest bond strength with 29.47 MPa.

Conclusion: Shading procedures can affect the bond strength showed the lowest bond strength with 29.47 MPa.

Two Unsplinted Mandibular Implant Overdentures: A 3-Year Longitudinal Prospective Study
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Aim: Rehabilitation with two splinted or unsplinted implants for overdenture is well established, with the former design considered less technically demanding.

Aim: This study evaluated the masticatory performance, Oral Health-Related Quality of Life (OHRQoL) and denture satisfaction 3 years after conventional complete dentures (CCD) were converted to implant overdentures (IOD) retained by two telescopic or Locator abutments.

Materials and methods: This study was approved by Ethical Committee, University Malaya, Malaysia. Implants were inserted in the interforaminal region and connected to the abutments after 4–6 weeks healing period. Of the 32 patients who received IODs, 21 patients (six male, 15 female; mean age 61.95 years, range 48–79 years) were evaluated at 3 year. Objective masticatory performance with CCDs and IODs was recorded using mixing ability test (two-coloured paraffin wax cube) to obtain Mixing Ability Index (MAI). Questionnaires were used to assess OHRQoL using Shortened Oral Health Impact Profile-14, Malaysian version (S-OHIP-14(M)) and Denture Satisfaction Questionnaires. Statistical analyses were made using repeated measure ANOVA, t-test and Wilcoxon Signed Rank test at p = 0.05.

Results: Mean MAI values showed significant difference between the three intervals, the highest shown at 3 year. Total OHIP and individual domains (functional limitation, physical pain and physical disability) median scores showed significant improvement before and after and remained stable at 3 years after implants. Similarly median score for satisfaction with mandibular prostheses (stability, chewing, and comfort) showed significant difference.

Conclusions: Two unsplinted IOD improved masticatory performance, OHRQoL and satisfaction compared to CCD 3 years after implant.
the design of a prosthesis that protects oral tissues while considering the patient’s ability to cooperate with treatment.

P327

**Multidisciplinary Treatment of an Adult Patient with High Esthetic Demand**

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**Introduction:** Aesthetic expectations of the treatment of adult patients are increasing in these days. However, these patients often present with serious oral problems, such as over-crowding, agenesis, edentulous spaces from old extractions, periodontal problems, etc. In the face of all these problems, we need interdisciplinary strategies that will help us carry out the complex and imaginative treatments that these cases require.

**Case:** A 40-year-old male patient had elongated incisors with cross-bite and edentulous spaces. The incisors were corrected with orthodontic treatment and edentulous spaces were treated with implant-supported fixed partial dentures. In this case report, an interdisciplinary treatment plan will be described which includes all disciplines of dentistry.

**Conclusion:** Interdisciplinary approach in dental treatments provides full treatment of adult patients and perfect aesthetic.

P328

**Occlusal Precision of Cerec CAD/CAM Generated Lithium Disilicate Crowns**

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**Purpose:** The purpose of this study was to evaluate the precision of occlusal contacts of the Cerec CAD/CAM generated crowns fabricated using the bite registration (BR) and buccal image (BI) methods for determination of the maximum intercuspal position. The null hypothesis was that BR and BI methods would not differ in terms of precision of occlusal contacts.

**Materials and methods:** Twelve casts representing clinical situations were mounted in semi-adjustable articulators to serve as simulation models. The left lower first molars were prepared to receive lithium disilicate crowns. The Cerec inLab method was applied on the models. Two casts were produced for each preparation using BR and BI methods for static occlusion determination. The crowns were milled using the parameters of 40 μm luting space and 250 μm occlusal offset. Virtually designed occlusal contacts (DES) and contacts that corresponded to DES (CORR) were analyzed. The mean quotients (DES/CORR) for BR and BI crowns were calculated. The Wilcoxon signed rank test at p = 0.05 was applied to determine statistical significance.

**Results:** All 24 crowns had no premature contacts and did not need any occlusal adjustments. The mean quotients (DES/CORR) for BR and BI crowns were 2.3 (±1.35) and 1.69 (±0.77), respectively. The Wilcoxon signed rank test revealed no significant difference. Lithium disilicate crowns fabricated using Cerec inLab method with predefined milling parameters had no premature contacts and required no occlusal adjustments. Satisfactory occlusal contacts could be obtained for BR and BI crowns with no significant difference.

P329

**Prosthetic Rehabilitation of Two Patients after Maxillectomy**

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**Introduction:** Head and neck carcinomas are the most frequent causes for surgical resection of the maxilla and it ultimately affects the quality of life of the patient. These patients require prosthetic rehabilitation of the defect, to improve speech, deglutition, esthetics, and mastication. The obturator prosthesis fulfills most of these requirements. The maxillofacial prosthetic rehabilitation provides restoration of missing teeth and, surrounding tissue restoration, esthetic appearance, preservation of remaining teeth, and physiologic support to provide the potential for acceptable speech and swallowing.

**Case:** The first case is a female person and 61 years old. She had a defect in the middle of maxilla and two operations for the closing of defect area. In our clinic we planned an upper and lower complete denture with maxillary obturator. Obturator prosthesis was obtained with unistage according to conventional procedure and then was supported with permanent soft liner. The second case is a male person and 67 years old. He had a hemimaxillectomy operation and also upper jaw had no teeth. In the lower jaw the patient had natural dentition. The obturator prosthesis was done for upper jaw.

**Results:** The quality of life after rehabilitation with obturator prosthesis was decreased. Especially speech and swallowing function were important for the first patient and this function was provided successfully. For the second patient nutrition was the most important function and it was provided.

**Conclusion:** Obturator prosthesis is a highly positive and non-invasive approach to improve the quality of life of patients with maxillectomy defects.

Theme: General Dentistry and Oral Health

P330

**Human Dental Pulp Stem Cells Isolation and Osteogenic Differentiation**

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**Aim:** The aim of this study was to isolate stem cells from human exfoliated deciduous teeth (SHED) and dental pulp stem cells (DPSCs) and to assess their osteogenic capability.
Methods: In the present study, SHED and DPSCs were isolated by their ability to adhere to plastic plates. After isolation osteogenic media was supplied comprising L-ascorbic acid, dexamethasone and β-glycerophosphate. The evaluation of their osteogenic differentiation was performed using alizarin red stain. RT-PCR was done to analyze the mRNA level of osteoblastic differentiation marker genes; Osteocalcin and Bone Sialoprotein II over several days.

Results: Stem cells were successfully isolated from both tissues. Colorimetric changes in response to Alizarin red stain indicating calcium crystals deposition and successful osteogenic differentiation of SHEDs and DPSCs was seen in obvious intensity. As for the RT-PCR performed; Bone Sialoprotein II and Osteocalcin genes were detected in the SHEDs plates on day 12 but absent in the DPSCs plates. Both genes were also detected on day 22 even in control plates. SHED showed an earlier onset of mineralization and higher differentiation capability in comparison to DPSCs.

Conclusions: This study demonstrated that stem cells can be isolated from the pulp of deciduous and permanent teeth, and illustrated the differences in the growth and differentiation characteristics between SHED and DPSCs. Consequently, SHED may represent a suitable, accessible and potential alternative source for regenerative medicine and therapeutic applications.

P331
Frequency of Brushing Between Dental Students and Non Medical Students
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Objectives: Brushing frequency between dental and non-medical student.

Introduction and aims: Professional recommendations for individual oral hygiene mostly include tooth brushing at least twice daily for 2–3 min with gentle force. This study evaluated whether habitual tooth brushing of dental students and non-medical students actually meets these standards.

Materials and methods: This study was conducted at the Dental college of Liaquat University Of Medical And Health Sciences Jamshoro Pakistan and Sindh University Jamshoro during the academic year march 2013. Total 462 students (231 dental student, 231 non-medical students) participated in this study. Participation was voluntary, and all the participants were queried anonymously. A specifically designed questionnaires consist of a questions how many times you brush a day? Followed by four stems from which student could select one answer. The questionnaires were collected in person immediately after completion.

Results: Out of 462 students 231 (99 male, 132 female average age 20–25) were dental students and 231 students (111 male, 120 female average age 20–25 years) were non-medical students. Among 231 dental students 70.12% (162) responded to brush twice a day, 15.58% (36) brush once a day, 10.38% (24) brush three times a day, 3.89% (9) brush after every meal. Among non-medical students 80% (185) brush once a day, 13% (40) two times a day, 1.29% (3) brush three times a day, 1.29% (3) brush after every meal.

Conclusion: The study shows that brushing habit among majority of medical students meet the recommended standard. While majority of non-medical students need to improve their brushing habits to maintain oral hygiene.

P332
Oral Findings and Dental Treatment of a Sturge-Weber Syndrome: A Three Year Follow-Up
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Aim: Sturge-Weber syndrome is a rare, nonhereditary developmental condition that is characterized by a hamartomatous vascular proliferation involving the tissues of the brain and face. This report presents oral findings and dental treatment in a 3 year follow-up period of a case of Sturge-Weber syndrome.

Case: A 22-year-old female patient attended to our clinic at with a complaint of caries, pain, halitosis and gingival bleeding during tooth brushing. Medical history revealed Sturge-Weber syndrome and glaucoma. In extra-oral examination, port wine stain and hemi hypertrophy on the left side of the face, ear, neck and upper lip which followed the edge of the midline was seen. In intra-oral examination, stain was evidenced at the hard and soft palate, the alveolar ridge, gingiva and buccal mucosa on the affected side, caries was observed in first and second left maxillary premolar teeth and gingivitis was present. Endodontic and gingival treatments were performed under local bleeding precautions and antibiotic prophylaxis. During periodic follow-up, the premolar teeth healed up successfully, but caries developed on right maxillary second and mandibular first molar teeth and gingivitis re-occurred. Restorative and periodontal management of the patient were performed.

Conclusion: The intraoral angiomatosis are presented in 40% of cases and results in an important periodontal alteration, increasing the risk of bleeding during dental procedures. Successful results from conservative, endodontic and periodontal treatment could be achieved form these patients under local bleeding precautions.

P333
A Comparative Study of Oral Health Attitudes and Habits of Preclinical and Clinical Dental Students in Ankara, Turkey
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Objective: The aim of this study is to compare oral health attitudes and habits between preclinical and clinical dental students.
Management of Erythema Multiforme

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Introduction: Erythema multiforme (EM) is an acute, often recurrent, hypersensitivity reaction affecting mucocutaneous tissues, seen especially in males, and characterized by serosanguinous exudates on the lips, mouth ulceration and sometimes target-like on skin. The etiologies of EM until now are unknown. Many studies report the etiologies of EM caused by multifactors like allergic reaction of medication, foods, microorganism reaction, systemic, and others.

Case: This case report is 43 years old female which has lesion in oral mucosa, lips and cheek and diagnosed as Erythema Multiforme Minor, caused of Herpes infection.

Conclusion: Significant result shown after 3 weeks medication with acyclovir, the lesion was cured and complaints of pain in some parts was reduced.

Dental Injury Incidence and Prevalence of Mouthguard in Japanese Ice Hockey Players

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Introduction: Maxillofacial and dental injuries are often occurred in ice hockey (IH) because of hard contacts between players and/or equipments. In fact, use of protective gear such as facemask and mouthguard (MG) is mandatory or recommended in International Ice Hockey Federation rule. The aim of the present study was to assess the actual status of the dental injury and the prevalence of MG in Japanese IH players.

Materials and methods: Questionnaire survey was conducted to 49 male players (16–38 years) of two IH clubs in Japan. Questions consisted of medical injuries, dental injury and MG usage. The study was approved by the Ethical Committee for Human Research of TMDU.

Results: Forty-one players (83.7%) suffered from medical injuries during match and/or practice. Injury to lower extremity was most frequent (61.2%). The incidence of dental injury was 28.6%, and 17 (lacerations of oral or labial mucosa) was most frequently reported. Main cause was collision with the ice or the wall of skating rink (61.2%). The MG prevalence was 100%, and all were custom-made type. Nevertheless, 72.2% of players did not wear their MG at the time of accident.

Discussion: This investigation elucidated that dental injuries among IH players in Japan were considerably high despite of the high MG prevalence. This is because they did not use their MG actively both during match and during exercise. Therefore, dental health care professionals should educate on the benefits of MG and instruct IH players to wear it constantly for ensuring maximum level of safety.
rate variability (HRV) measures were obtained continuously during the whole experiment.

Results: The cold pressor test resulted in a significant increase in sAA at 3, 5, and 10 min after cold pressor test. Furthermore, this test resulted in a significant increase in cortisol at 10, 20 and 30 min. There was a positive relationship between sAA and sympathetic tone.

Conclusions: Both cortisol and sAA would be promising candidates for a reliable, noninvasive marker of psychological stress. Our results conclude that sAA would be an indicator of sympathetic activity.

P337
Receiver Operator Characteristics Curve: Novel Technique of Assessment of Sequence of Eruption
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Introduction: The preliminary method of estimation of age is the sequence of tooth eruption. The accuracy of this technique depends on the available literature of sequence of eruption which varies according to the race/ethnicity/gender etc. Estimation of sequence of eruption requires a meticulous longitudinal study following up a child till all the teeth have erupted.

Aim: To predict and compare the eruption sequence of the permanent dentition as derived by two methods of estimation (ROC and Probit analysis) in children of Dakshina Kannada Region.

Methodology: In this cross sectional study, number of teeth present in dental records of 1000 children of known age and gender (age range 6–14 years) were recorded. The SPSS software was used to do the statistical analysis. The highest sensitivity and specificity of presence of each tooth at a given age was considered as the most likely time of eruption of that tooth (ROC method). This was then compared with the eruption sequence obtained by the Probit analysis (proposed by Kusri).

Results and discussion: The results showed that the permanent central incisor erupts earlier or along with the permanent first molar in this geographic region. The study documents the use of ROC curve to predict the age of eruption of the permanent teeth as a reliable technique correlating with the established Kusri’s Probit analysis. ROC curve analysis predicted the eruption closer to the normal sequence than the Probit analysis.

P338
Uncommon Entities in Dentistry: A Series of Case Report
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Aim: The General Dentist is constantly challenged to face complex clinical cases, identify causative factors and to either treat or refer them, depending if the case meets or exceeds his or her caliber. The aim of the presentation is to show rare cases that can be met during everyday clinical practice.

Materials and methods: Cases collected from General Dentists’ offices are selected with the criterion of being rare (<4% in the literature). They are presented with documentation: Among them, a supernumerary primary tooth, cases of supernumerary one sided maxillary wisdom tooth, bilateral supernumerary maxillary wisdom teeth, cases of external and internal tooth resorption, a chin implant with a similar radiological appearance to a tumor, a hyperplasia of the soft tissue due to a filler and a case of odontoma in the sinus.

Results: Each clinical case underwent differential diagnosis and treated accordingly-if needed.

Conclusions: The General Dentist must posses an elevated clinical and scientific awareness in order to excellence in both patient expectations and clinical management of each case.

P339
Bisphosphonate-Associated Osteonecrosis of the Jaws and Its Management
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Aim or purpose: Bisphosphonates are commonly prescribed for the treatment of postmenopausal and corticosteroid induced osteoporosis, Paget’s disease, hypercalcemia associated with malignancy and osteolysis, associated with metastatic bone disease. Bisphosphonate-associated osteonecrosis of jaw (BONJ) may result in serious oral complications, such as osteomyelitis and chronic exposure of necrotic bone. Dentists must be familiar with this disorder and pay special attention to all patients on bisphosphonate therapy due to their defective osteoclast function and reduced osseous tissue vascularity, leading to impaired wound healing.

Materials and methods: This was a retrospective review of BONJ. Data analyzed included age, sex, smoking status, underlying disease, medical and dental history, bisphosphonates (BP) type. Local and systemic risk factors, clinical and radiographic findings, treatment strategies and the result of treatment of our patients who are diagnosed to have BONJ are documented and evaluated.

Results: The most common clinical osteonecrosis presentations included infection and necrotic bone in the mandible. Associated events included dental extractions, infection, and trauma. Despite surgical intervention, antibiotic therapy, hyperbaric oxygen therapy, and topical use of chemotherapeutic mouth rinses, some of the lesions did not respond well to therapy. Patients with persistent infection were re-operated or palliative treatment was started.

Conclusion: The conclusions of this study validated dental extractions and use of dentures as risk factors for BONJ development. Before initiation of a bisphosphonate, patients should have a comprehensive dental examination. Patients with a challenging dental situation should have dental care attended to before initiation of these drugs.
P340

GIC's Cytotoxicity on SHED Correlates with Fluoride, Strontium and Aluminium

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Aim: To test seven commonly used GICs for their toxic effects on SHED and its correlation with fluoride, strontium and aluminium content in eluates.

Methodology: Elution samples of GICs were prepared in sterile tissue culture medium and the medium was tested for toxicity by an assay MTT test. Chromosome abnormalities induced by GICs eluates were tested by cytogenetic analysis. Concentrations of Fluoride, Aluminium and Strontium ions in the eluates were assayed by high performance liquid chromatography. One-way ANOVA and Student’s t test were used to analyse the cytotoxicity, bivariate correlation and partial correlation were used for correlation between concentration of single ion and cytotoxicity and correlation between combined ions and cytotoxicity.

Results: Fuji II, Fuji VIII, Fuji IX, Fuji plus and Viterbond had significantly higher cytotoxic effect on SHEDs then Composite. Only SHEDs that have been treated with Fuji I, Fuji IX, Fuji plus and Composite recovered potential for proliferation, but no chromosome aberrations were found after treatment with GICs. Cytotoxic effects of GICs on SHEDs were in strong correlation with coupled concentrations of released fluoride, aluminium and strontium. Fuji I had lowest activity toward SHEDs, but did not interrupted mitosis and did not induced chromosome aberration.

Conclusions: The results of this study indicate the potential harmful effects of GICs on SHEDs, the cells which could be isolated from stored pulp and could be used in cell based therapy in sinus host. Cytotoxic effect of GICs is in correlation with released fluoride, aluminium and strontium.

P341

Electronic Protocol for Focal Oral Diagnostics

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Aim: Oral diagnostics as an interdisciplinary problem requires teamwork of different medical specialists. Each of them must have all medical records of the patient and must be facilitated in the communication with other team members. In today’s society of electronic communications in which computers are playing key role, the creation of an electronic record of oral diagnostics would meet the needs of the experts’ team.

Materials and methods: An investigation of the scientific literature has been carried out in order to create a protocol for testing and diagnostics, which to serve as the basis of the user (graphical) interface of the computer program.

For the creation of the computer program a programming language of high level Visual C++ has been used. The drawing of the special elements has been performed using interface OpenGL. To work with application data (database) standard SQL, as a form of a standard database – Microsoft Access has been used.

Results: As a result of the conducted research with a specialist programmer in our team we have developed software product “Electronic Focal Diagnostics v.1”. The computer program is an electronic protocol for integrated oral diagnostics and has the features of a consultation module, assisting the dentist during the process of focal diagnostics.

Conclusions: The creation of the electronic medical record of the patient, which is easily portable and can be transmitted electronically between physicians is a step forward in modern oral diagnosis and would save valuable time for diagnosis and treatment.

P342

Cytotoxicity of Silorane and Methacrylate Based Dental Composites on Human Gingival Fibroblasts

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Introduction: Methacrylate based dental composite is been widely used as filling (restorative) material in dentistry. Polymerization shrinkage and marginal integrity of restorations are the inevitable problems with methacrylate based composite. A silorane based composite (Filtek P 90), comprising of ring-opening monomer, have been introduced claiming low polymerization shrinkage. Filtek P90 comprises of silorane resin, filler, initiator system, stabilizer and pigments. The biocompatibility of Filtek P 90 was tested using individual constituents of silorane rather than Filtek P 90 as a whole. In the present study we evaluated the cytotoxic effect of Silorane (Filtek P90) in comparison with methacrylate based (Z 100) composite on human gingival fibroblasts (HGF) on their viability and proliferation rate.

Methods: Fresh healthy biopsy specimens of human gingival tissue of patients were obtained with necessary consent form. For HGF, cells were cultured in Dulbecco’s modified Eagle medium and grown to sub confluent monolayers. After attaining confluence cells were treated with different doses of the Filtek P90 or Z 100 composite on human gingival fibroblasts (HGF) on their viability and proliferation.

Results: The results of the cytotoxicity assay showed that the percentage of viable cells was very good in the first 24 h and decreased in the next 48 h period in all groups. The proliferation rate was never below 70% in all the groups, at any given concentration.

Conclusions: This study concludes that both the test material was not cytotoxic and are regarded safe when tested for the HGF in an in vitro study.
Temporomandibular Disorders, Headaches and Depression: Romanian Student Cohort Study

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Aim: Evaluating the prevalence of headaches and temporomandibular disorders (TMDs), their relationship with lifestyle choices and demographic factors, as well as the relationship between TMDs, headaches and depression.

Materials and methods: The sample consisted of 132 Romanian medical and dental students (43.1% male; mean age 27.80 years, SD = 8.32). They completed, in 2011, an ethically approved and previously validated questionnaire which included sections regarding demographic features, lifestyle, a Zung depression assessment and questions about the presence and nature of headaches and TMDs. Pearson chi-squares and Mann–Whitney U tests were used for data analysis.

Results: 14 patients (10.60%) presented TMDs, out of which 6 (42.9%) had seen a dentist for their pain and 6 (42.9%) presented depression and only previous trauma to the head and/or neck represented a significant predictor [OR = 13.490 (95% CI: 1.066–170.733), p = 0.045].

82 patients (62.12%) presented headaches with a mean age of debut of 21.27 years (SD = 1.108, range 8–40), 34 patients (25.75%) suffering headaches at least once per month, 19 patients (23.17%) having debilitating headaches (22.60%), 19 patients (23.17%) presenting depression, with smoking and loss of consciousness being the only significant predictors [OR = 4.152 (95% CI: 1.166–14.787), p = 0.028; OR = 6.548 (95% CI: 1.243–34.505), p = 0.027] and drug usage almost reaching statistical significance [OR = 11.213 (0.889–141.531), p = 0.062].

No significant correlations were found between sexes for both TMDs and headaches (p = 0.671; p = 0.875), as well as between TMD and headaches (p = 0.645).

Conclusion: TMD patients should be assessed for harmful lifestyle factors, previous trauma and depression and referred to a suitable care provider.

Evaluation of Dental Students’ Reasons for Choosing Dentistry and Post-Graduation Career Plans

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Objectives: The aim of this research was to analyse the reasons for choosing dentistry and the future career plans of the dental students.

Methods: This research was conducted on the students of Yeditepe University Faculty of Dentistry. Questionnaires about the reasons for choosing dentistry were distributed to 282 students. The response rate was 90%. Also, information about career expectations was gathered. Statistical analyses were performed using chi-square, Mann–Whitney U and Kruskal-Wallis tests. The significance level was set as p < 0.05.

Results: Dentistry was among the first 3 choices in the matriculation exam (73.1%). The will of being self-employed, thinking that dentistry has high professional reputation and the low possibility of unemployment were among three main reasons for choosing dentistry. Having previous practice in dentistry-related jobs was the least important factor for this result. Taking own dental practitioners as role models, making people’s appearance better and reasonable working hours were the predominant reasons that motivated females to become a dentist (p < 0.05). 62.1% of the students planned to receive postgraduate education. Meanwhile, 73.1% of the students planned to working Istanbul. However, only 30% of the students were actually from Istanbul.

Conclusion: Reasons for choosing dentistry included perceived ease of employment, being self-employed and high professional reputation. Previous dentists’ approach had more influence on female students to choose dentistry compared to male students. The major reasons for female students’ in selecting the dental profession were to make people’s appearance better and regular working hours. Students generally considered to specialize in a specific branch of dentistry and preferred working in the city where they got educated rather than the city where they were born.
end of study serum calcium and magnesium levels were examined. Density measurements were performed on radiographs of right mandibular first molar teeth. RANKL and TRAP staining were performed on histological slides.

**Results:** Alveolar bone loss was significantly higher in the O+P group than other groups ($p < 0.05$). Boric acid decreased bone loss ($p < 0.05$). TRAP+ osteoclast numbers were highest in periodontitis group and lowest in control group. The differences in TRAP+ osteoclast numbers among control, P, O+P and BA50 groups were significant ($p < 0.05$). There were no significant differences in RANKL expression and mandibular bone density among groups ($p > 0.05$).

**Conclusion:** Within the limitations of this study, we conclude that boric acid may decrease alveolar bone loss in osteoporotic rat model of periodontitis.

### P346

**Oral Health and Menopause: Questionnaire Study on Quality of Life**

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**Purpose:** The purpose of this study was to investigate how the condition of oral health in menopause stage associates with mental and physical statuses, because women in menopause is regarded to have more problems of oral health.

**Materials and methods:** One hundred and eleven female dental hygienists aged 40–59 years participated in this questionnaire study and were asked to answer the questionnaire including menopausal index, General Oral Health Assessment Index (GOHAI), socio-demographic factors, self-rating questionnaire for depression (SRQ-D) and Mos Short-Form 36-Item Health Survey (SF-36). The participant with hysterectomy, thyroid disease, hyperpiesia, diabetes or depression was excluded from the analysis. Depending on their menstrual status, 97 participants were divided into pre-menopausal, menopausal and post-menopausal groups. This study was approved by the Review Board of the universities. Analysis of variance was used for parametric comparisons among three groups, and Pearson’s correlation coefficients were examined for analysis of association between oral health status and menopausal status.

**Results:** Except that menopausal group showed significantly higher score on SRQ-D than pre-menopausal group, no significant differences were found in any other indices between three groups. Statistically significant negative correlation was observed between GOHAI score and each score of menopausal index and SRQ-D, and statistically significant positive correlation was observed between GOHAI score and sub-category score of SF-36 such as role-physical, role-emotional and social functioning.

**Conclusion:** This study suggested that oral health problem in and peri-menopause stages may relate to menopause symptoms as well as psychological condition and role-physical, role-emotional and social functioning assessed by SF-36.

### P347

**Does Salivary Antioxidant Capacity Reflect that of Blood Serum?**

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**Aim:** As it is generally recognized that oxidative stress is involved in aging and a number of diseases and reduction capacity of oxidative stress is important for disease prevention and control of aging, we measured the antioxidant capacity of saliva and seek the possibility of assumption of serum antioxidant capacity from salivary level.

**Materials and methods:** Unstimulated saliva and blood were collected from healthy young (19–33 years old) and midlife (40–54 years old) adult volunteers. The amount of saliva was measured immediately after collection. After centrifugation at 3000 rpm for 10 min, the supernatant of saliva and blood was collected and the antioxidant capacities of supernatant was measured by using test kit for potential anti oxidant (PAO, JaICA, Japan) which evaluates reductive activity for Cu2+ as an antioxidant capacity.

**Results:** A significant and high correlation was observed between antioxidant capacities of saliva and serum, showing that the mean value of the saliva was about one-third of the serum. There were no statistically significant differences in antioxidant capacities of saliva and serum between young and midlife subjects with no difference in salivary secretion rate.

**Conclusions:** From the above results, it is suggested that the antioxidant capacity of serum can be generally assumed from saliva and the antioxidant capacities of supernatant was measured by using test kit for potential anti oxidant (PAO, JaICA, Japan) which evaluates reductive activity for Cu2+ as an antioxidant capacity.

**Method:** Evaluation of Anaerobic Bacteria in Periodontitis by E Test

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Aim: The purpose of this study was to evaluate antibiotic susceptibility of anaerobic bacteria species in periodontitis patients using E test method.

Material and methods: The study group included 42 patients (27 female; 15 males) selected after clinic periodontal status, which was realized in the oro-dental office- Department of Preventive Medicine and made by measuring: probing pocket depth (PD), bleeding probing (BP), index plaque (PI). The periodontal pus was collected with sterile paper point; bacteria biochemical identification was made by using API Rapid ID 32 A (bioMerieux); antibiotics susceptibility was determined by the E test method (AB Biodisk), according NCCLS recommendation and by using: Ampicillin, Amoxicillin, Amoxicillin/Clavulanate, Metronidazole, Tetracycline, Doxycycline. Statistical analyses were performed using t test and Pearson correlation coefficient. Ethical permission was approved before the starting of the study. The period of time studied taken into account in this interpretation: 1 January-1 march 2013.

Results: Were isolated an total of 116 anaerobic bacteria strains: Prevotella intermediata 73.2% (85), Porphyromonas gingivalis 23.2% (27), Bacteroides forsythia 3.6% (4); the global percentage of susceptibility were as follows: Metronidazole-100% Amoxicillin/Clavulanate-93%, Ampicillin-71%, Amoxicillin-75%, Doxycycline 90%, Tetracycline-56%. Each clinical periodontal markers: PD, BP, PI, were positively associated with the presence of anaerobic bacteria (p < 0.001).

Conclusions: Metronidazole has been highly effective against all identified anaerobes species and we can considered that this is still the election drug for treatment in periodontitis. Anaerobic bacteria species with low susceptibility to antibiotics, such as Tetracycline, imposes knowing the antibiotics susceptibility level of anaerobic bacteria species before periodontitis treatment.

Theme: Implantology: Implantology

P349

CBCT from Clinical Assessment to Surgical Guide
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The aim of this study: To demonstrate CBCT role in multiple implant treatment planning. Various X –ray data are compulsory in order to have predictable optimal fixture-bone and anatomical structures position. The limited nature of two – dimensional radiographs on the widths and thickness of the maxillary bone must be extended to 3D imaging.

Materials and methods: In this study 32 patients were diagnosed using CBCT for each jaw, 1.0 mm thick slice. Pre-op radiological stents have been placed on both mandible and maxilla and digital 3D image has been created by superposing different scans of jaws and stent. Prosthetic preview and digital wax-up were used in order to accurately predict exact position for each implant. Final step has been the virtual design of the surgical guide.

Results: Surgical guide has been realized using high technology Direct Metal Laser Sintering (DMLS), based on the project designed previously.

Conclusions: Computer -assisted implant surgery (CAIS) is becoming a routine investigation. In this study were used all technical options offered by new technology.

P350

In Vitro Research on the Influence of Ultrasonic Vibration in Human Osteoblasts
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Aim: In 2011 Jeremy Mao, DDS (Columbia University–NYC-USA), presented a new device designed to use the force of ultrasonic vibration in order to accelerate the movement of teeth.

Materials and methods: The device makes use of pulse forces aiming to fasten the movement of teeth through accelerated bone remodeling. This technique has been applied to other parts of the human body, such as repairing bone fracture and density in long bones. The premise is very simple: instead of using constant pressure, the device exerts very soft pressure and vibrations on the teeth for 20 min/day. Users can do many of the tasks of their daily routine during the activated mode and the device is easily recharged in an incase set.

Results: The mechanism of osteogenesis mechanically stimulated is not fully understood. According to Gussmão et al. (2012), in response to a mechanical stimulus, there is the synthesis of PGE-2 culminating in the influx of calcium to the intracellular space. This cytokine pro-inflammatory responds to 50–90% of the induction mechanism of osteogenesis, being the most important prostaglandin in the mechanotransductor system, being also related to the bone neoformation and reabsorption. This association had been related mainly to the role of calcium, once its intracellular concentration – in the presence of mechanical stimulus – determines the synthesis of PGE-2 (Cherian et al., 2005; Genetos et al., 2005; Li et al., 2005; Xu et al., 2007).

Conclusion: This research aims to assess the in vitro influence of the ultrasonic vibration force in cultures of osteoblastic human cells.

P351

Three-Dimensional Finite Element Analysis of Taper-Cylindrical Screw Implant in the Posterior Maxilla Subjacent to Sinus
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Purpose: This study was to investigate the biomechanical properties of taper-cylindrical screw implants in comparison with cylindrical
implants in the posterior maxilla subjacent to sinus by using three-dimensional finite-element analysis.

**Materials and methods:** The CT image data of a maxillary bone (type IV) with a missing first molar was reconstructed. The crestal height were 4 and 7 mm without sinus bone graft, 4 and 7 mm with sinus bone graft, 10 without sinus bone graft or 13 mm without sinus bone graft. Two threaded CAD implant models of cylindrical and taper-cylindrical shapes were created. Oblique, axial and horizontal loadings with different forces were applied respectively. With software ANSYS10.0, stresses in the peri-implant bone and displacement of the top of the implant was evaluated.

**Results:** Taper-cylindrical implant induced less stresses in cortical bone and reduced the displacement of the top of the implant at all bone levels. At 4-mm bone level, stresses and displacement produced by taper-cylindrical implants decreased under both axial and horizontal load with sinus bone graft conducted but increased under oblique load. At 7-mm bone level, stresses and displacement generated by taper-cylindrical implants reduced under all three kinds of loads when sinus bone graft was operated.

**Conclusion:** In the aspect of biomechanical behavior, Taper-cylindrical implant is more ideal than cylindrical implants in the posterior maxilla subjacent to sinus. Sinus floor augmentation is recommended when the residual bone height is no more than 7 mm.

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**P352**

**Placement Gingival Level Implant on Posterior Mandibular**

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**Case:** Patient 58 years old have problems chewing on the bottom right and left side. Over 5 years wear a removable metal frame denture, and feeling uncomfortable because having to remove and reinstall each time. Patient was asked for placement implant on the bottom right and left side. Placement of two pieces of gingival level implants performed on the right bottom and one pieces of gingival level implant on the left bottom. After 3 months placement of healing screw, and 2 weeks later placement of abutment and followed with impression.

**Conclusion:** Two weeks later placement of PFM crowns and after 3 years, the patient feels better for mastication.

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**P353**

**Allografts and Autografts Volume Changes after Vertical Augmentation**

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**Aim:** The aim of the present study was to investigate changes in the volume of an irradiated, demineralized, freeze-dried bone allo- and de novo graft (DFDBA) and to compare it to a fresh-frozen, mineralized bone allograft, autogenous bone graft (AT), and blood clot (C).

**Materials and methods:** Nine rabbits were used, with one as the primary bone graft donor and eight that were subjected to a model of guided bone regeneration (GBR), whereby 32 titanium cylinders with a volume of 98.12 mm³ were fixed to the calvaria and randomly filled with DFDBA, FF, AT, or C. The animals were sacrificed 13 weeks later, and the content of the cylinders was subjected to clinical assessment to quantify the resulting tissue volume.

**Results:** All of the grafts adhered to the recipient bed. The DFDBA exhibited the largest average resulting volume (73.73 ± 18.28 mm³); however, it was not significantly different from the FF (71.54 ± 16.40 mm³). The average resulting volume of the AT was 45.42 ± 22.46 mm³, and it was significantly different from the DFDBA and FF. In this model of GBR, the grafts maintained the volume more effectively than the C (11.64 ± 4.85 mm³).

**Conclusion:** The use of bone allografts, particularly DFDBA, represents an alternative to autogenous bone for the correction of volume defects of the alveolar ridge because it is safer and easy to store, and it has been proven to be more effective for maintaining the graft volume in this model of GBR for vertical tissue augmentation.

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**P354**

**Clinical Image Quality Assessment in Panoramic Radiography**

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**Aim:** This study was performed to assess the quality of panoramic radiographs obtained and to identify those errors directly responsible for diagnostically inadequate images.

**Materials and methods:** This retrospective study consisted of 150 panoramic radiographs obtained from the Department of Oral Diagnosis and Radiology. All projections were made with the same radiographic equipment (Morita Veraviewops model 550 (Kyoto-Japan), with the maximum KVP of 80, mA = 12, monitor 17 inch TFT LCD, 100–240 VAC 60/50 Hz, Global Opportunities). The images were exported and saved in Joint Photographic Experts Group (JPEG) file and no adjustment of contrast, brightness and magnification was performed. Two oral and maxillofacial radiology specialist evaluated those images using the Clinical Image Quality Evaluation Chart and classified the overall image quality of the panoramic radiographs and evaluated the causes of imaging errors.

**Results:** The mean of the scores was 79.69 ± 14.87. In the classification of the overall image quality, 28 images were deemed “optimal for obtaining diagnostic information”, 80 were “adequate for diagnosis,” 37 were “poor but diagnosable,” and five were “unrecognizable and too poor for diagnosis”. The results of the analysis of the causes of the errors in all the images are as follows: 103 errors in the positioning, 15 in the processing, four from the radiographic unit, and none of them is due to anatomic abnormality.

**Conclusion:** The positioning errors found on panoramic radiographs were relatively common in our study. The quality of
panoramic radiographs could be improved by careful attention to patient positioning.

P355
Photogrammetric Analysis of Multiple Implant Abutment Impressions under Different Conditions
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Purpose: This investigation evaluated and compared the dimensional accuracy of a vinyl polysiloxane (PVS), a hydrophilic polysiloxane and a polyether (PE) impression materials when used under dry, moist and wet conditions.

Materials and methods: An acrylic master model with six implants (Tidal Spiral Dental Implant Systems, Huntsville, AL, USA) placed bilaterally in place of the maxillar right and left canine, second premolar and second molar was constructed. A total of 108 impressions were made of from this acrylic model. The materials used in this study were a hydrophilic polysiloxane impression material (Zetaflow, Lot No. 129666, Zhermack, Italy), a hydrophilic vinyl polysiloxane impression material (Elite P&P, Lot No. 130025, Zhermack, Italy) and a polyether impression material (Impregum Penta Soft Quick, 3M ESPE, Germany). Twelve impression of each material were made under each of the three conditions; dry, moist and wet. Two reference distances were evaluated on each study model. Distances evaluated by a graphics editing program (Adobe Photoshop CS4, Adobe Systems Inc., San Jose, CA, USA) One-way analysis of variance and Student t-test were used to compare mean dimensional changes.

Results: There was a significant difference on the dimensional accuracy of all tested materials (p < 0.001). The percentage of dimensional changes under dry, moist and wet conditions respectively were at VPS samples 0.549%, 1.182% and 1.647%, at polysiloxane samples 0.967%, 1.682% and 2.660% and at PE samples 0.444%, 0.704% and 1.945%. With in the limitation of this study, the least dimensional change was determined with the polyether impression material.

P356
Rehabilitation of a Patient with Partial Mandibular Resection and Reconstruction
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Introduction: Partial or total resection of mandible or maxilla is a surgical procedure which is quite difficult to rehabilitate and restore.

Case: A 57 years old female patient was applied to our clinic with a partially resected and reconstructed mandibula with free flap iliac bone and soft tissue graft due to oral squamous cell carcinoma. There were missing and periodontally compromised teeth because of gingival recession and root resorption at the maxillary dentition as well. Moreover the vertical dimension of occlusion and intermaxillary distance were restricted after the surgery. The aim of the treatment was to restore the function, esthetics and phonetics. For this purpose, maxillary metal ceramic fixed partial dentures and a four implant supported mandibular total denture were fabricated and placed. The patient was regularly recalled during postoperative period.

Conclusion: Clinical examinations of 6 months post-treatment revealed no evidence of disorders associated with the restored teeth or their supporting structures. The wide application range and the benefits of modern implant dentistry make the rehabilitation of such difficult cases possible.

P357
Influence of Thread Number and Length on the Push-Out Strengths of Zirconia Implants: A Pilot Study
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Aim: Macroscopic and microscopic designs of zirconia implants are crucial in the success of osseointegration and their longevity since they have been shown to be capable of withstanding oral forces over an extended period of time. The aim of this study was to investigate the influence of various macroscopic designs of zirconia implants including thread number and thread length on their push-out strength, and screw displacement before failure.

Materials and methods: Six types of zirconia implants (n = 60) with square shaped threads in 0.2 mm thickness were designed and tested mechanically. Six groups (A–E) were formed (n = 10). In group A, zirconia implants had four threads with 1 mm length, in group B, four threads in 0.5 mm length, in group C, six threads with 1 mm length, in group D, six threads with 0.5 mm length, in group E, eight threads with 1 mm length and in group F, eight threads with 0.5 mm length. All implants were embedded in dental plaster and subjected to push-out test. Failure modes were assessed quantitatively and morphologically. The data were statistically analyzed with a three-way analysis of variance (ANOVA) (p < 0.05).

Results: Statistical differences in failure modes were investigated by chi-square tests at a significance level of p < 0.05. Push-out forces were significantly increased when the thread number decreased (p < 0.05). Moreover, shorter thread lengths generated lower push-out force values. These zirconia implants also had larger relative displacements. Maximum push out resistance was attained in group A.

Conclusion: Macroscopic design of zirconia implants can substantially affect the mechanical properties.

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3D Course of Inferior Alveolar Canal Defined by Cone Beam Computed Tomography
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Aim: The aim of this study was to define the course of inferior alveolar canal within the mandible to delineate safety zones for dental alveolar surgery.

Materials and methods: Cone beam computed tomography images of 100 patients obtained using Planmeca Promax 3D MID were analyzed. The diameter of inferior alveolar canal as well as bone thickness on the buccal, lingual and inferior aspects of the canal at premolar, molar and retromolar regions were measured. The localization of the mental foramen was determined.

Results: Inferior alveolar canal in its course makes a curve having highest level in the retromolar region (mean of 11.2 mm), lowest in the molar region (8.3 mm) and ascending again in the premolar region (10.3 mm). It also crosses the body of mandible from lingual to buccal. In the molar region, the bone thickness buccal to the canal is 5.3 mm as opposed to 3.4 mm in the lingual side. In premolar region, 3.1 mm bone in buccal side and 5.7 mm in lingual side was measured. The mean diameter of the canal was found to be 1.95 (±0.6) mm. The mental foramen was most commonly localized between the roots of premolars (47 cases), forming an anterior loop in 14 cases.

Conclusion: Before surgery performed to the mandible, the course of inferior alveolar canal should be born in mind through which it makes a curve in the infero-superior direction, crosses the body of mandible from lingual to buccal and possibly forms a loop before leaving the mental foramen.

A Dental Volumetric Tomography Study on the Visualization of the Mental Foramen’s Anterior Loop in Dentate Patients
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Aim: The aim of this retrospective study is to determine the distribution of anterior loop in dentate patients by examining their dental volumetric tomography (DVT) images.

Materials and methods: Fifty patient’s (25 female, 25 male), aged between 20 and 39 and without tooth loss, DVT images were evaluated for both right and left side of mandible. If the mental branch leaves the inferior alveolar nerve anterior to the opening of the mental foramen, it is described as type1. If the mental branch leaves the inferior alveolar nerve perpendicular to the opening of the mental foramen, it is described as type2. If the mental branch leaves the inferior alveolar nerve anterior to the mental foramen, it is described as type3. It is assumed that there is no loop in type1 and type2. Type3 indicates the presence of anterior loop.

Results: The distribution of type3 and type2 is similar with each other however type1 is not commonly found. The percentage of each type on right or left side is found 2% for type1, 46% for type2 and 52% for type3. Besides the percentage of type2 on both side at the same patient is found 34% and type3 on both side at the same patient is found 42% with higher rates than other combinations.

Conclusion: Dental volumetric tomography (DVT) can be used safely to observe the track of mental nerve from the inferior alveolar nerve to the mental foramen for various surgical operations involving the mental foramen area.

Temperature Changes During Simulated Implant Surface Decontamination with Er:YAG Laser
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Aim: The aim of this in vitro study was to investigate the temperature changes at the implant-bone interface and implant surface during simulated implant surface decontamination with Er:YAG laser.

Materials and methods: Implants were inserted to bone blocks cut from freshly resected bovine femurs. Simulating buccal periimplant bone defects were created to each blocks. Temperature changes were monitored by 3 thermocouples placed at implant-bone interface in proximal (T1), palatal/lingual site (T2) and implant surface at the apical area (T3). Bone blocks were placed into water bath in order to simulate intraoral conditions. The implants were irradiated for 60 s using pulsed Er:YAG laser (λ = 2.940 nm) (pulse energy, 150 mJ; pulse duration, 300 μs; frequency, 15 Hz) with regard to no cooling, cooling with water or air and cooling with air+water.

Results: In mean, the critical threshold of 47°C was exceeded after 31.50 ± 14.71 s at T1, 37.4 ± 11.01 s at T2, 42.33 ± 8.73 at T3 in no cooling group. Other groups did not exceed critical threshold in any time period. At equal energy fluence, Er:YAG laser with no cooling induced significantly higher temperature increase than other cooling methods in all measurement points.

Conclusion: Decontamination of implant surface by means of Er:YAG laser with no cooling excessively heat the periimplant bone within the energy range investigated. Cooling with air and/or water would minimize the risk of temperature induced bone necrosis as a result of lasing implant surface.
Introduction:

Istanbul, Turkey

Maxillofacial Surgery, Dentistry Faculty, Marmara University,
ing as small, red erythematous papules on a pedunculated or
icaly, oral PG is a smooth or lobulated exophytic lesion manifest-
possibly because of the vascular effects of female hormones. Clin-
dominantly occurs in the second decade of life in young females,
microorganisms are seldom demonstrated within the lesion. It pre-
pathway for invasion of nonspecific microorganisms, although
sues to minor trauma and/or chronic irritation, thus opening a
that pyogenic granuloma possibly originates as a response of tis-
originally believed to be a botryomycotic infection. It is theorized
irritants. The etiology of the lesion is not known, though it was

Materials and method: Fifty-four subjects underwent CBCT exami-
nation of the mandible for implant therapy. The axial cross sec-
tions through the anterior mandible were carefully examined in
order to detect the lingual vascular canals. Their presence, position
and trajectory were established.

Results: Lingual canals in the premolar region of the mandible were observed in 32 subjects (59.25%). These vascular canals typ-
ically had an anterior trajectory, perforating the lingual cortical
plate, and ended in the mandibular incisive canal. In all, 22
(40.74%) patients presented these canals on the right side and 22
(40.74%) on the left side. Twelve patients (22.22%) presented the
lateral vascular canals bilaterally. The most common position of
the canals was the second premolar (45.45%), followed by the
first premolar (38.63%) and the canine (13.63%). In one case this
channel was depicted in the lateral incisor region.

Conclusion: CBCT examination can reveal the presence, position
and morphology of the lingual vascular canals in the premolar
region of the mandible. These canals have an arteriolar content,
which may lead to an intense bleeding during the osteotomy for
implant placement. Clinicians should be aware of these anatomical
structures and their possible implications in implant dentistry.

Theme: Implantology: Oral Pathology

P362

Pyogenic Granuloma – Hyperplastic Lesion of the Gingiva: Review
of 10 Cases

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Introduction: Pyogenic granuloma (PG) or granuloma pyogenicum
is a reactive hyperplasia of connective tissue in response to local
irritants. The etiology of the lesion is not known, though it was
originally believed to be a botryomycotic infection. It is theorized
that pyogenic granuloma possibly originates as a response of tis-
sues to minor trauma and/or chronic irritation, thus opening a
pathway for invasion of nonspecific microorganisms, although
microorganisms are seldom demonstrated within the lesion. It pre-
dominantly occurs in the second decade of life in young females,
possibly because of the vascular effects of female hormones. Clin-
ically, oral PG is a smooth or lobulated exophytic lesion manifest-
ing as small, red erythematous papules on a pedunculated or
sometimes sessile base, which is usually hemorrhagic. The surface
ranges from pink to red to purple, depending on the age of the
lesion. Histologically, the surface epithelium may be intact, or
may show foci of ulcerations or even exhibiting hyperkeratosis.
PG in general, does not occur when excised along with the base
and its causative factors. Although excisional surgery is the treat-
ment protocols such as the use of Nd:YAG laser, flash lamp pulsed
dye laser, cryosurgery, intraleisional injection of ethanol or cortico-
steroid and sodium tetradecyl sulfate sclerotherapy have been
proposed.

Case: This paper reports 10 cases on patients that visited the Oral
and Maxillofacial Surgery Department of the Dental Faculty in the
Dicle University.

Conclusion: We report the location, size, course and treatment of
each lesion, comparing the results obtained to those reported in
the literature.
P364
Digital Imaging Evaluation of Bone Defects Healing: Animal Study
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Aim: The aim of this research was to evaluate the accuracy and the reliability of assessing bone defects regeneration using 2D digital radiography and CBCT.

Materials and methods: The animals, Wistar rats, were divided in two groups (n = 23), with similar distribution regarding age, gender and weight. For both groups we induced right and left parietal bone defects of 5 mm diameter each. Bone defects created on the right side were with no material added, while the left parietal bone created defects were coated with osteoconductive, osteoinductive, osteogenetics and alloplastic material. The study was approved by the Ethics Committee of the University. The imaging was done after 2 and 4 months after surgery, using 2D and 3D methods CCD and CBCT. Bone healing and histological evaluation were assessed by a scoring system by five observers evaluating all digital images and the corresponding histological sections.

Results: The resorption of the biomaterial and the formation of new bone trabeculae were observed in both CCD and CBCT images. All images showed that the bone regeneration process was improved by using alloplastic material. CBCT system allows measurements of bone thickness at an good accuracy and assessment of small defects regeneration.

Conclusion: CBCT is a reliable, noninvasive and promising technique for assessment of small bone defect healing.

P365
Analysis of Relationships between Maxillary First Molar and Maxillary Sinus
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Objectives: To assess the relationships between the maxillary first molar and the maxillary sinus floor in a group of patients.

Methods: One hundred and fifty patients were recruited for this study. The distances between the examined roots (mesio-buccal, disto-buccal and palatal) as well as furcations, and the sinus floor, were evaluated using cone beam computed tomography, and grouped as follows: class 0: distance = 0 mm; class 1: 0 mm < distance < 2 mm; class 2: 2 mm ≤ distance < 4 mm; class 3: 4 mm ≤ distance < 6 mm; class 4: 6 mm ≤ distance.

Results: The mean distance of the disto-iplatal root to sinus floor was 1369 mm; mesiolipalatal root to sinus floor 2014 mm and the palatal root to sinus floor 1533 mm. The prevalence of class 0 was the highest for the palatal root (60%), mesiobuccal (54%), and disto-buccal (54%) roots was the same.

Conclusions: The results suggest that the palatal root of the maxillary first molar had the closest relationship with the sinus floor.

The clinician should be aware of the anatomical and morphological details of this root, especially when taking surgical decisions.

P366
Chronic Osteomyelitis of the Mandible in Children and Adolescence: 21 Cases Report
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Purpose: To study the clinical and radiographic features of chronic osteomyelitis of the mandible in children and adolescence.

Materials and methods: Twenty-one patients with chronic osteomyelitis of the mandible were included in this study. All of them were younger than 17 years old with the mean age at onset was 10.1 years old. Panoramic radiographs and CT scan were performed and surgical treatments were undertaken. Clinical and radiographic data were analyzed.

Results: The age at onset of symptoms was at two incidence peaks, 6–8 years old and 12–14 years old. Eighteen cases were unilateral and three cases were bilateral. Six patients had impacted molar (second or third molar) with no signs of dental caries or periapical lesions. No causative teeth were found in nine patients. Bony changes on CT images were classified into four patterns: 1) mixed pattern (10 cases); periosteal new bone formation with destruction of medular and/or cortical bone; 2) proliferative pattern (five cases): periosteal new bone formation with intact or small defect of cortical bone. 3) sclerotic pattern (three cases): sclerotic change spread extensively in the mandible. 4) sequestrum pattern: (three cases): sequestration with periosteal new bone formation. Operation findings revealed inflammatory lesions including abscess formation, foci of pus, or inflammatory granulation tissue in seven patients. All of them were mixed pattern on radiographs.

Conclusion: The findings of our investigation showed that most of the chronic osteomyelitis of the mandible in children and adolescence demonstrated periosteal new bone formation without sequestration and fistula. Impacted second molars may be the insidious causative teeth in some patients.

P367
Somatosensory Evoked Potential to Assess Neurosensory Disturbance Following Removal of Third Molar
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Objective: The purpose of this study was to evaluate hypoesthesia of the lower lip using trigeminal somatosensory evoked potential (TSEP) following surgical removal of impacted third molar.

Materials and methods: This prospective study involved 350 patients who underwent surgical removal of impacted third molars. Preoperative TSEP for all patients were recorded. A total of 27 (7.7%) patients showed neurosensory disturbance of IAN immediately postoperatively. Those 27 patients were considered as the study group. Another 27 patients out of the 350 patients with
no altered sensation were included in this study as a control group. IAN paresthesia at 1, 6, 12, 18 and 24 months postoperatively were recorded using TSEP.

**Results:** All patients in the study group showed complete loss of sensation in the lower lip ipsilateral to surgical side immediately postoperatively. A total of 17 (62.9%) patients had full recovery when reviewed at 12 months postoperatively. At 18 months postoperatively a total of 23 (85.1%) patients experienced full recovery of the chin and lower lip sensation. However, no more patients showed signs of recovery at 24 months postoperatively. TSEP measurements for those patients suffered from neurosensory disturbance showed sine waves. None of the patients in the control group reported loss of sensation in the lower lip ipsilateral to the surgical side immediately postoperatively and throughout the study period.

**Conclusions:** TSEP is a valuable method to assess neurosensory disturbance of IAN and it might play a role as an objective way to evaluate nerve function in oral and maxillofacial region.

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**P368**

**Implant Treatment in Patient with Chronic Alcoholism – A Case Report**

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**Background and aim:** Dental implants are increasingly being used to replace missing teeth. The dental literature contains numerous observations on the significance of systemic disorders as contraindications to implant treatment. There are aspects that may be associated with alcoholism, which might need to be considered before implants are placed. These may include the fact that alcoholism is often associated with tobacco smoking, may cause a bleeding problem or osteoporosis, and may affect: bone mass, immunity, nutrition. The purpose of this article is to show the correlation between chronic alcoholism and dental implant failure.

**Case:** A 56-year-old female patient with missing teeth referred to Istanbul University, Department of Oral Surgery for dental implant treatment. There were no problems during surgery and primer stabilization was adequate. After 3 years, patient had the complaint of mobility, pain and it was recognized that the patient is a chronic alcoholic and heavy smoker. Peri-implant marginal bone loss was evaluated by digital panoramic radiography. Chronic periodontitis, hyperemia and 5–6 mm bone loss around the implant region was seen. Implant failure was occured.

**Result:** Multivariate analysis showed that peri-implant marginal bone loss was significantly related to a daily consumption of alcohol, and increased plaque levels and gingival inflammation. Daily alcohol consumption may have a negative influence on predictable long-term implant treatment outcomes, producing peri-implant bone loss and compromising restorative treatment with implant-supported prostheses. Thus, although there is no evidence that alcoholism is a contraindication to implants, such patients may not be a good risk group.

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**P369**

**Laser Assisted Depigmentation Treatment with ER.CR: YSGG Laser – A Case Report**

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**Background and aim:** Gingival melanin depigmentation procedures are commonly associated with recurrence of pigmentation, which starts with migration of melanocytes from the adjacent free gingiva. Although clinical melanin pigmentation does not present a medical problem, demand for cosmetic therapy is commonly made by fair-skinned people. Currently, lasers have major advantages such as the production of local homoeostasis, reduced postoperative pain and oedema, bacterial elimination, the possibility of contact-free incision and the avoidance of the need for sutures. The Er, Cr:YSGG laser is a high-powered laser which works in a localized way, removing tissues only at the laser light focus. The aim of this article is to capture the success of laser in depigmentation treatment without local anesthesia.

**Case report:** A 37-year-old female patient with the complaint of pigmented gingiva referred to Istanbul University, Department of Oral Surgery. Intraoral examination revealed deeply pigmented gingiva on both maxilla and mandible. Routine oral hygiene procedures were carried out and oral hygiene instructions were given. Er, Cr:YSGG laser was planned to use. Local anesthesia was not needed. No pain or bleeding complications were observed during and after the procedure.

**Result:** Laser beam produces bloodless field for surgery, causes minimum damage to the periosteum and underlying bone, and the treated gingiva and mucosa do not need any dressing. But this approach needs expensive and sophisticated equipment, Repigmentation was minimal and patient compliance was much better in laser treatment than other techniques.

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**P370**

**Assessment of Buccal Cortical Bone Osteotomy for Benign Mandibular Lesions**

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**Objective:** Adaptation of the decortication and bone replacement (DBR) technique was reevaluated by long-term prognosis of three patients with deep benign mandibular lesions.

**Cases:** Case 1: A 39-year-old man with radicular cyst in left mandibular first and third molars who underwent cystectomy with DBR under general anesthesia. His postoperative-9-year course was favorable. Case 2: A 60-year-old man with impacted tooth and dentigerous cyst in left mandibular third molar who underwent tooth extraction and cystectomy with DBR under general anesthesia. His postoperative-7-year course was favorable without
n numbness. Case 3: A 53-year-old woman with benign tumor in the left mandibular bone. Owing to the history of tumorectomy for jaw tumor in the same region 13 years before, the case was considered as its relapse. Tumorectomy was performed with DBR under general anesthesia. Pathologic diagnosis was ossifying fibroma and her postoperative-8-year course was favorable without relapse.

**Results:** Although all three postoperative courses within 7–9 years were favorable without numbness or relapse, partial lack of continuity was observed in the outer cortical bone although width and height of the bone were well maintained.

**Conclusion:** While DBR provides many advantages including direct-vision lesion removal and less damage on the lower alveolar neurohemal bundles, the long-term prognosis showed partial lack of continuity in the outer cortical bone. Thus, DBR could further improve prognosis of patients, including application to implant treatment if tight osteosynthesis and bone graft to the dead space are performed.

**P371**

**The Effect of Tube Drainage Vs. Conventional Suturing on Postoperative Discomfort after Third Molar Surgery**

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**Aim:** The aim of this prospective randomized study was to compare the effects of tube drainage on maximal mouth opening, facial swelling, and pain after third molar surgery.

**Study design:** Forty patients requiring extraction of bilaterally impacted mandibular third molars were selected. Each patient had two operations. In the first operation, a drainage tube was inserted into the buccal fold after the suture procedure and left there for 2 days. In the second operation, conventional suturing technique was used on the contralateral side.

The patients were evaluated by the same person for maximal mouth opening, facial swelling, and pain in the immediate preoperative time point and on the second, fifth, and seventh days after surgery.

**Results:** There was a statistically significant difference in mouth opening, facial swelling, and pain on second day in drain group.

**Conclusion:** The use of a drain had the advantage of less postoperative pain, swelling and trismus following third molar surgery.

**P372**

**Surgical Correction of Vestibule of the Mouth in the Complex Treatment of Patients**

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**Purpose:** Improvement of the effectiveness of diagnosis and complex treatment of patients with generalized periodontitis I-II stages and shallow vestibule of the mouth used modifications of tunnel vestibuloplasty.

**Materials and methods:** There were examined 120 patients with generalized periodontitis I-II stages and shallow vestibule of the mouth. Established clinical and laboratory features, morphological, topographical indicators of mucous membrane of vestibule of the mouth and periodontal tissue and ultrasound properties of bone tissue.

**Results:** We have detected that shallow vestibule of mouth aggravates the course of generalized periodontitis. Developed and justified modifications method of tunnel vestibuloplasty, supplemented with quercetin in postoperative period. The positive effects of the proposed treatment regimens on clinical characteristics: maintaining normal depth of vestibule of the mouth, significant improvement indices of oral hygiene and periodontal tissues, restoring morpho-functional state of the mucous membrane of the gums.

**Conclusions:** Using the proposed method of complex treatment of generalized periodontitis in patients with shallow vestibule of the mouth proved significant improvement in periodontal tissues.

**P373**

**Multiple Bilateral Supernumerary Mandibular Premolars in a Non-Syndromic Patient: 6 Years Follow Up**

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**Aim:** Supernumerary teeth may be defined as any teeth or tooth substance in excess of the usual configuration of 20 deciduous and 32 permanent teeth. The most common supernumary teeth listed in order of frequency, are the maxillary midline supernumeraries (mesiodens), maxillary fourth molars, maxillary paramolars, mandibular premolars, maxillary lateral incisors, mandibular fourth molars and maxillary premolars. The aim of this study is to present an unusual case of a non-syndrome female patient with bilateral multiple mandibular supernumerary teeth which occurred 6 years follow up.

**Case:** Twenty years old female patient presented to our clinic complaining of pain in her permanent teeth. A panoramic survey of the teeth showed an unerupted teeth were located on the left and right mandibular arch. Following local anesthesia a subcircular incision was performed and supernumerary tooth were extracted.

**Conclusion:** There were no resorption in sixth year radiography. Presently, the patient is followed up through periodic examinations.

**P374**

**Case Report: Sinus Lifting and Implant Therapy Procedure**

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**Introduction:** Missing teeth may result in a functional and cosmetic deficit and have traditionally been replaced with dentures or
bridges. Dental implants offer an alternative, they are inserted into the jawbones and support dental prostheses. Dental implants rely on the maintenance of a direct structural and functional connection between living bone and the implant surface, this is termed osteointegration.

Edentulous, or partly edentulous, patients with an insufficient bone height for dental implants in the lateral part of the maxilla can be treated with bone grafting in the maxillary sinus. This inlay augmentation procedure is known as “sinus lifting”. To obtain of good quality autogenous bone grafts are referred to as the golden standard.

Case: A 53-year-old male patient presented to the periodontal department clinic. Sixteen, 17 and 18 numbered teeth were missing and inadequate bone height is found in the righ maxiller posterior area. Patient hasn’t stated any systemic disease and history of smoking.

After initial and non-surgical treatment, computed tomography was taken. The sinus elevation procedure was performed. Postsurgical medications were prescribed. The graft site healed uneventfully, and there were no clinical signs of inflammation after surgery. Implants has placed 6 months after surgery. Orthopantomograph was taken 6 months postoperatively. The healing period progressed without any complications, and all implants were integrated and were loaded after the healing period.

Conclusion: It is important to note that grafting materials used in sinus lift procedures are still under investigation and still uncertain as to what quality and quantity of bone would ensure clinical success.

P375

3D Manufacturing of Surgical Fibular Bone Flap Guide for Reconstruction of a Mandibular Cancer Surgery
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Introduction: In recent years, the combination of the evolution in imaging, the development in computer technology and the use of precise modeling machines in medical sciences had let us to construct the 3D models of the human body parts and medical devices.

Case: Computerize Tomography (CT) images of 20 years old patient with osteosarcoma on the left mandibular posterior region was refered to our center for the manufacturing 3D plastic model (ABS plastic, ZCorpor). The resection of the cancer tissue and simultaneous the fibular bone graft for the resection region surgery was planned. The track of the incisions on both the mandibular resection region and the fibular bone section which would be used as the graft were planned on computer environment. Then, two incision and one connector guides with their fixing sets were designed with the help of computer software (MIMICS, TRIMATIC). The guides (stainless-steel) and fixing sets (TiAlVa) were manufactured by Selective Laser Melting technique on laser sintering machine (M2 Concept Laser). Double surgical team performed the resection and reconstructing surgery simultaneously with the help of the designed guides.

Conclusion: The use of the newly developed technologies in design and the manufacturing 3D models and medical devices would be helpful for the surgeons to comprehend their cases, in preplanning the complicated surgical procedures, avoid many malpractices, minimize the risks of surgery and should provide many other benefits like reducing the surgery interval.

Theme: Preventive Dentistry: Caries

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Role of Chewing Gum in Caries Preventing Among Children
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Aim: It is known that stimulation of salivation is an effective method of preventing general dental diseases. Along with the widespread proliferation of soft, shredded food the phenomenon of “chewing laziness” has appeared. It leads to development of anomalies and reduces the intensity of self-purification processes of the oral cavity.

Based on this statement, we drawn attention on such a stimulant of saliva secretion and intensification of self-purification processes of the oral cavity as “Dirol Effect with carbamide” chewing gum which, according to our research, is the basic tool for prevention of dental diseases of school age children.

Materials and methods: Our research of 347 school children (8–15 years) showed that regular use of one cushion of medical-preventive chewing gum “Dirol Effect with carbamide” three times a day after meals for 25 min had a remarkable anti-caries effect, had significantly positive effect on functional status of the regional vessels in school children with clinically healthy periodontium.

Results: The pupils with periodontal disease needed more dose-sparing regimen of medical-preventive chewing gum “Dirol Effect with carbamide” such as one cushion three times a day for 10–15 min after meals, depending on the severity of the disease.

Conclusions: The use medical-preventive chewing gum should be controlled by dentist and recommended for “chewing laziness”, sialoschesis, poor self-purification, and for improving the remineralization processes of hard tissues of the teeth.

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Results of Supervised Toothbrushing with the Remineralizing Toothpaste in Dental Caries Prevention
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Aim: Aim of this study was to evaluate an efficacy of supervised tooth brushing with a remineralizing toothpaste in reduction of dental caries.
Materials and methods: In a study group (SG) 260 7-ys-old school children were assigned to brush teeth with fluoride-free remineralizing toothpaste, containing active components Ca, P, Mg, xylitol, during two school-years under supervision of school teachers after ethical approval and parents' consent. In “control” group (CG) 225 school children of the same age received the standard oral hygiene instruction and were brushing teeth at homes using fluoridated toothpastes available in shops. DMFT were recorded at baseline, 12 and 24 months single blind examinations.

Results: In the SG av. baseline DMFT was 0.46 ± 0.91 SD, increasing to 0.81 ± 1.15 after 12 and to 1.12 ± 1.34 after 24 months. In CG-baseline DMFT was 0.4 ± 0.82, increasing to 0.93 ± 1.22, 1.46 ± 1.36 after 12–24 months accordingly. The difference of 2-year increments between SG and CG groups was 0.4 DMFT (37.7%). Comparision of averages of DMFT at the end of study between SG and CG have shown the reduction of caries in SG by 23.3% (p < 0.05).

Conclusion: The 2-year supervised toothbrushing program in schools with the use of the remineralizing toothpaste was effective in reduction of dental caries of permanent teeth in primary school children.

Investigation of Mouth-Dental and Physical Health of Some University Students
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Purpose: The goal of this study is to obtain some information about oral and physical health of some university students.

Method: One hundred and seventeen University students (62 girls, 55 boys) who applied to Dental Clinics were examined and given a questionnaire of 40 questions. The questionnaire asked for BMI, DMF-s, DMF-t and CPITN indexes. We used the SPSS Program for statistical analysis.

Results: The average student age is 23.9 ± 2.4 and BMI is 21.8 ± 2.4. The DMF-s, DMF-t and CPITN indexes are (10.8 ± 2.4), (2.4 ± 2.4) and (2.4 ± 2.4), respectively. It was determined that 95.7% of the students have dental brushing habits, where 81.2% of those brush their teeth 1–2 times a day, and 65% of those have gum bleeding during brushing.

74% of students don’t receive periodontal therapy, 58.9% of doesn’t receive dental therapy, 76.9% of have dental problems. It was determined that 58.1% of the students don’t smoke and 50.4% of them don’t have systemic diseases. There is significant positive correlation between the DMF-s index and the age of the students (p = 0.030). As student age increases, DMF-s index values also increase. There is a significant positive relationship between the DMF-s and the CPITN indexes (p = 0.004). When the DMF-s index increases, so does the CPITN index. Student BMI didn’t effect the DMF-s, DMF-t and CPITN indexes (p > 0.05). Students have dental caries and periodontal diseases. I recommend conducting health and orientation seminars about routine control.

Effect of the Fluoride Varnishes Comparing to CPP-ACP Complex on Human Enamel Demineralization/Remineralization
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Aim: This in vitro study was conducted to investigate the effect of fluoride varnishes comparing to CPP-ACP complex on the inhibition of enamel demineralization.

Materials and methods: Enamel blocks were ground flat, allocated into five groups and subjected to a daily cycling regime. Three groups were treated within the period of 10 min with fluoride varnishes: Fluoridin N5, Bifluorid 12 and Fluor Protector, one was treated only with GC Tooth Mousse (Recaldent CPP-ACP 10.0%) and one control group. Fluoride varnishes were coated once a week before the demineralization period. All specimens were stored in artificial saliva between and after cycles. The surface microhardness (SMH) of the specimens was determined at baseline and after 12 days using HMV-2000 (Shimadzu, Japan). The percentage of SMH change (%SMC) was calculated before and after cycling regime. Data were analysed by t-test for individual comparisons (p < 0.05).

Results: Statistical analysis by t-test showed significant difference between SMH before and after fluoride treatment in all groups. All groups treated with fluoride varnishes and GC Tooth Mousse showed increase in SMH. The highest values of increase in SMH were observed for the Fluoridin N5. There was no significant statistical difference between the%SMH of the enamel between groups.

Conclusion: The results obtained in the present study showed that high fluoride varnishes and Tooth Mousse effectively inhibit demineralization under experimental conditions.

Effects of Titratable Acidity and Organic Acids on Enamel Erosion
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Purpose: The aim of the present study was to determine the erosive potential difference among four naturally acidic fruit nectars (mandarin, orange, lemon, grapefruit) within the same range of titratable acidity and its components of the organic acids.

Methods: Diluted fruit nectars (mandarin 1:1.1, orange 1:1.7, lemon 1:15, grapefruit 1:20) with the same range of titratable acidity (7.9 ml) were used. Bovine specimens were randomly allocated to each group and exposed in 30 ml of test solutions for 1 h. Before and after procedure, enamel erosion was measured by microhardness test and CLSM (p < 0.05). The separation of organic acids was carried out using a high performance liquid chromatography.
chromatography to analysis composition of each test solution. Data were statistically analyzed by one-way analysis of variance.

**Results:** Enamel erosion occurred with all test groups and showed similar decrease in VHN (no statistically differences were founded in the enamel surface hardness after erosion). The surface roughness changes similarly in orange, lemon, grapefruit groups and little difference in mandarin group. The citric and malic acid was the major organic acid in all test fruit; in lemon and orange group, malic acid showed the highest concentration among four kinds of fruit, in mandarin group had the lowest malic acid.

**Conclusions:** All the tested groups with same titratable acidity resulted in no significant enamel erosion; even it had different pH value. Citric and malic acid is major organic acid, especially malic acid. It remains that the titratable acidity and malic acid could be major factors on dental erosion.

**Theme:** Preventive Dentistry: Epidemiology

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The Epidemiological Investigation of Dental Caries among the 5 Years Old Children in Shanghai Suburban District

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**Purpose:** To investigate the oral health status and its influential factors among the 5 years old in Shanghai suburban, and to provide first hand data for prevention of caries.

**Methods:** According to the Third National Oral Health Investigation criteria, the oral status of 1135 elementary school students in 8 the elementary school were examined. SPSS14.0 software package was used for statistical analysis.

**Results:** The prevalence of dental caries and caries means of 1135 subjects were 58.5% and 2.4 respectively, The prevalence of dental caries and caries means in rural area was significantly higher than that in city area, ($X^2 = 14.98 \ p < 0.05$); There was no significant difference of caries prevalence between male and female ($X^2 = 1.52 \ p > 0.05$).

**Conclusion:** Oral health status of the children in Shanghai suburban should be paid more attention, and more effective measures should be taken to the incidence of dental caries for the elementary school students of countryside by remind of government departments, and bring down distinction between the city area and rural area.

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Dental Caries Experience and Treatment Needs among 12 Years Old in Albania

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**Aim:** The Aim of this study was to measure the dental caries experience and treatment needs among the age group of 12 years olds in Albania.

**Methods:** The study was a cross sectional survey conducted in 2011. We used the DMFT and SiC indices to measure the dental caries experience and the ratio of D/DMFT representing the prevalence of untreated caries. Ethical approval was received from the Ministry of Health. Permission was acquired from the school authorities and parents. We used cluster sampling technique. Schools and classes were selected randomly. The 1928 participants were from 16 regions, public schools both in towns and suburbs and represented different social economic level based on the Institute of Statistics of Albania data. Calibration was done for the examiners, from each region. We followed the WHO criteria. Clinical Examination and a dental exam form were completed for each participant.

**Results:** For the age group of 12 years old the mean DMFT = 3.72 (SD = 2.66), the mean D = 2.02 (SD = 2.06), SiC = 6.72 (SD = 1.92) and the prevalence of caries free was 13%. The prevalence without active carie (D = 0) was 29.6% and the prevalence of untreated caries was D/DMFT = 0.56 (SD = 0.36).

**Conclusions:** Dental caries experience and untreated dental caries was high compared with the EU countries data. There is a need for a national preventive program and also to improve dental care access for this age group.

**Acknowledgements:** Ministry of Health of Albania.

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Permanent Molars Eruption in Mexican Rural and Urban Population

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**Purpose:** To describe the eruption level of the first permanent molars of 6 and 7 years old schoolchildren in rural and urban population.

**Materials and methods:** Prospective and descriptive research. Six and 7 years old schoolchildren (whose parents or guardians signed the consent form) of Southeast Mexico were studied. Non-probabilistic sampling. The clinical test was conducted outside the classrooms, with number 5 dental mirrors. The eruption was registered from the emergence of any part of the clinical crown, specifying the eruption level: 1/3, 2/3, or full eruption. This was performed by three inter-intra calibrated examiners (Kappa 0.89, p < 0.001). Chi-square with 95% reliability was used to analyse the gender and population (rural and urban) differences.

**Results:** Two hundred and eighty-nine schoolchildren were studied (48% boys and 52% girls), 97 six years old and 192 seven years old. There were no significative differences in these variables in the geographic area. 6.66 ± 0.47 was the average age. Sixteen percentage and 7% molars have not erupted with 6 and 7 years old respectively, with significative difference in lower molars.
Role of Gene Variations of Toll like Receptors 2, 3 and 4 on Genetic Susceptibility to Periapical Pathosis

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Aim: We aimed to investigate role of gene variations of TLR 2, 3, and 4 on genetic susceptibility to periapical pathosis.

Materials and methods: One hundred patients include this study and divided into two groups as follows; the patient group consists of 50 patients have periapical pathosis, and control group consists of 50 healthy patient that have no periapical pathosis. The primer sequences and restriction enzymes used for PCR-RFLP methods detecting each single nucleotide polymorphism (SNP).

Results: The results obtained by genotypical analysis of healthy control group and patient group were investigated to disclose whether there is any association between periapical lesions and gene variations. There are no significant statistical differences between patient and control groups according to TLR 2 and 4 gene sequence. On the contrary CT allele detected 67.5% for TLR 3 in patient group.

Conclusion: According to these results it can be suggested that patients with CT allele could be susceptibility to periapical pathosis.

Theme: Preventive Dentistry: Orthodontics

Middle Meningeal Artery as an Independent Module in Craniofacial Growth

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Aim: It is assumed that the development and growth of the endocranial structures leads to the final configuration of the calvarial and basicranial bones. The plasticity in the development of the different modules is strongly influenced by environmental factors. Orientation and shape of the meningeal vessels are partially influenced by the cranial base and vault. This study deals with the integration/modularity in the craniofacial development of the middle meningeal artery (MMA). A geometric morphometric study was carried on in skulls with anterior-posterior cultural deformation (AP) compared with an undeformed sample (U).
Materials and methods: Twenty-eight skulls with AP intentional deformation, coming from the Ancon Middle Horizon burials were compared with a group of 34 coetaneous apparently undeformed skulls (U) coming from the Rimak valley. Digital cephalometric and geometric morphometric study was carried on lateral radiographs. Digitations of landmarks were made employing tpsDig2 2.16 (J. Rohlf version) and posterior analysis with MorphoJ (Klingenberg) C. P. 2011 version 1.05 a*. Statistical analysis was carried out with the same package (canonical variate analysis and RV coefficient of modularity).

Results: Shape differences between AP/U were obtained for vault-MMA (CVA p < 0.0001) and for cranial base-MMA (CVA p < 0.0001). Modularity in AP group was for vault-MMA RV-0.589 and for cranial base-MMA RV-0.597. Modularity in U group was for vault-MMA RV-0.461 and for cranial base-MMA RV-0.557.

Conclusion: Intentional cranial deformation significantly changes the shape of vault, base and MMA. Integration and modularity patterns between these three structures are not affected by deformation.

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Skeletal Open Bite Treatment with Zygomatic Anchorage: A Case Report
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Aim: To evaluate the dentoskeletal effects of en masse impaction of posterior segments in an adult skeletal open bite patient by using posterior intrusion appliance and bilateral zygomatic anchorage.

Subject and methods: Seventeen-year-old female patient with increased skeletal vertical dimensions and an anterior open bite was treated with posterior intrusion appliance and bilateral zygomatic anchorage miniplates. An intrusion force of 450 g was applied per side with the aid of closed NiTi coil springs. After removing the intrusion appliance fixed orthodontic appliances were applied to correct crowding of the upper and lower arches.

Results: At the end of intrusion, correction of the anterior open bite was achieved. The molars were impacted 3 mm in 7 months and this impaction was maintained throughout the treatment. The mandibular plane showed a counterclockwise autorotation of 5° while anterior lower facial height was decreased 10 mm and overbite was increased 4 mm. At the end of treatment a Class I canine and molar relationship was obtained. Total treatment time was 30 months.

Conclusion: This case report demonstrates that bilateral zygomatic anchorage can be used effectively for intrusion of the upper posterior segments in skeletal open bite treatment and anchorage maintenance.

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Prevalence of Posterior Crossbite in Turkish Population
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Aim: The aim of this epidemiologic study was to evaluate the prevalence and distribution of posterior crossbite in Turkish population.

Methods: One thousand one hundred and ten patients (561 girls, 549 boys) aged 4.6–23 years, who admitted to Oral Diagnose and Radiology Department of our faculty in 1 year, were randomly examined and bilateral, unilateral posterior crossbite on the right and left sides were evaluated by orthodontists. The examined patients reflect the Turkish population since Ankara is a city where individuals from every province of Turkey come to receive health care.

The comparison of absolute frequencies of posterior crossbite types by dentition stages was evaluated by Chi-square, Fischer exact tests. p values equal to or <0.05 were considered significant.

Conclusions:
• The highest number of patients without posterior crossbite was in early mixed dentition.
• Bilateral and unilateral crossbite on the left and right sides had the highest frequency in permanent dentition.
• While the frequency of unilateral crossbite on the left side in primary and late mixed dentition did not differ significantly, the frequency of the crossbite on the right side increased significantly from primary dentition to late mixed dentition.
• Treatment of posterior crossbite should be started as soon as observed.

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Orthodontic Treatment of a Maxillary Impacted Canine with Autotransplantation
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Objective: Impaction of upper canines is a frequently encountered clinical problem. Routine treatment option is to uncover and bond the impacted tooth and to use orthodontic forced eruption. This case report describes the autotransplantation approach to palatally impacted maxillary canine.

Subject and methods: Twenty-four years old female patient with Class I malocclusion with a main problem of left upper canine impaction was treated with fixed appliances. After necessary space creation surgery was performed under local anaesthesia. New alveolus was prepared as completely as possible to a slightly wider socket. The canine was then carefully luxated and by making a circumferent incision around the crown, a collar of marginal tissue was secured to the tooth. The fixation was earlier often rigid with a splint and lasted for a period of 10 weeks. Late endodontic
treatment was performed. Then the autotransplanted canine was bonded and orthodontically levelled and aligned.

**Results:** The canine was successfully autotransplanted, orthodontically treated and showed good occlusion without external root resorption and normal periodontal conditions with pocket depths below 3 mm.

**Discussion and conclusion:** In this case the success of autotransplantation was high with no signs of resorption, hypermobility and periodontal problems. Autotransplantation of impacted and grossly malpositioned maxillary canines might be indicated in selected cases and could be successful in the long term.

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Impacted Anterior Teeth Due To Odontomas: A Case Report of Two Cases

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**Introduction:** Odontomas have been extensively reported in the dental literature, which may lead to interference with eruption of their associated teeth.

**Case:** This case report describes the diagnosis and treatment of two cases with two different kinds of odontomas. In both cases a surgical removal and orthodontic treatment were performed to bring the affected teeth into the arch. In the first case presented, the odontoma blocked the eruption pathway of the right central incisor. Histological investigation of the odontoma revealed that it was a complex odontoma. In the second case the odontoma blocked the eruption pathway of the left central incisor leading to retention of the deciduous left central incisor. Histological investigation of the odontoma revealed that it was a compound odontoma.

**Conclusion:** It is emphasized that a detailed radiographic examination of all patients that present clinical evidence of missing teeth, delayed permanent tooth eruption or tooth displacement due to a previous dental trauma should be performed. Multidisciplinary consultation may enable the clinician to find the accurate diagnosis and appropriate treatment plan based on the clinical and radiographic appearance.

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Management of White Spot Lesion after Orthodontic Treatment: A Case Report

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**Introduction:** This case report evaluates effectiveness of resin infiltration technique (Icon, DMG) in management of white spot lesions.

Case: A 14 year-old female referred to our clinic for correction of the white spot lesions on her anterior teeth which is spotted after finishing of orthodontic treatment. After resin infiltration technique with Icon (DMG, Hamburg, Germany) performed on the maxillary anterior teeth, white spot lesions size were recorded smaller but the lesions did not disappear.

**Conclusion:** Resin infiltration can be considered as effective treatment for treating white spot lesions after orthodontic treatment. With caries infiltration, white spot lesions can be treated without invasive restoration, but further investigations needed.

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Comparison of Linear and Angular Measurements Using 2D Conventional Methods and 3D CBCT Images Using Different Rendering Software

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**Purpose:** The aim of this study was to compare the linear and angular measurements which was conducted on 2D lateral cephalometric images and three-dimensional cone-beam computed tomography-generated cephalograms derived from various 3D volumetric rendering software.

**Materials and methods:** Pre-treatment cephalometric digital radiographs of 15 patients and their corresponding CBCT images were randomly selected. The digital cephalometric radiographs were traced using Vista OC and Romexis® software were used to generate cephalograms from the CBCT (Newtom 3G, QR, Verona, Italy). In total, 16 cephalometric landmarks were identified and 17 widely used (10 linear, seven angular) measurements were performed by an independent observers. Mann–Whitney and Kruskall–Wallis H tests were also used to compare the four methods (p < 0.05). Intra-class correlation coefficients (ICCs) were used to examine the intra-observer reliability.

**Results:** The results demonstrated no statistically significant difference between intra-observer analyses except for Condylion-Gnathion (Co-Gn) for CBCT generated cephalograms using various programs (p < 0.05). No statistical significance was found for Vista Dent OC measurements (p < 0.05). However, significant difference was found between Vista OC and Romexis® measurements (p > 0.05).

**Conclusions:** Measurements from in vivo CBCT generated cephalograms from 3D rendering software found to be similar on conventional images. 3D cephalometric norms should be defined for each population in order to evaluate patients with this modality and software.
Evaluation of the Effectiveness of Casein Phosphopeptide (Tooth Mousse) On the Oral Hygiene in Orthodontic Patients

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Introduction: Casein phosphopeptide (CPP) plays a role in stabilizing and localizing amorphous calcium phosphate (ACP) on the tooth surface. CPP can rebuild subsurface areas of enamel defects, however little is known about the effects of CPP in orthodontic patients on periodontal disease.

Aim: The aim of this randomized controlled clinical trial is to evaluate the effects of Tooth Mousse’s (CPP-ACP) on periodontal parameters, inflammation parameters and the saliva and GCF levels of IL-1 β, osteoprotogerin and RANKL in patients undergoing orthodontic treatment.

Method: The study population consisted of forty patients aged between 13 and 17 years with fixed appliances and ethics approval has been granted. First scaling was performed and oral hygiene introduction were given. After 1 month unstimulated saliva and GCF samples were collected from the incisors and canine teeth. Plaque Index, Gingival Index, Bleeding on Probing, Probing Depth, Bonded Bracket Index, DKK were carried out. Patients were randomly assigned to test group or the control group. Tooth Mousse were given only to the test group. One month after the examination, at the second visit all clinical indices were repeated.

Results: At the first visit GCF level of IL-1 β and PD scores, at the second visit PD were significantly higher in the test group. There was statistically significant difference in GCF Osteoprotogerin, BOP, BBI, GI scores between first and second visit in the test group, and saliva RANKL scores in the control group (p = 0.05).

Conclusion: In this observational study, CCP-ACP was associated with periodontal clinical parameters in patients undergoing orthodontic treatment. The results of this analysis should be confirmed in other observational studies.

Study of the Efficiency of Remineralizing Gel by Scanning Electron Microscopy

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Materials and methods: We used a remineralizing agent that is customarily used in homes, that consists of a combination of calcium glycerophosphate, xylitol and magnesium chloride. The study was performed on the patient’s teeth with crowding of the teeth. Twelve premolars with etched and intact sectors of the enamel were removed before using the gel, after a week of application, 2 and 3 weeks after the remineralizing therapy. The basic method is analyzing the morphology and elemental composition of the enamel SEM with energy dispersive microanalysis. We expanded the research areas to 50, 100 and 300 nm.

Results: After the second week, we observed a surface roughness decreasing, a shrinkage of microscopic spaces, an accumulation of the mineral component and the restoration of the surface layer of enamel prisms.

Positive changes were detected in the mineral composition of hard tissues. According to the study, the value of the Ca/P ratio was 3.4 for etched sectors of enamel; 2.3 for intact sectors. After 4 weeks of remineralizing therapy the value of the ratio of molar concentrations of Ca and P (Ca/P) was 1.7, which is optimum for dental hard tissues composition.

Conclusion: The effect of remineralizing gel observed for 4 weeks. The accumulation of macronutrients enamel can contribute to the reduction of the risk of caries in orthodontic patients with performing professional oral hygiene and local application of fluoride.
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Rapid Maxillary Expansion with Fan Type Hyrax Appliance in Treatment of Maxillary Anterior Skeletal Deficiency: A Case Report

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Aim: Rapid expansion is widely used for the treatment of maxillary transversal deficiency. The aim of this study was to assess the effects of fan type rapid maxillary expansion on maxillary dental arch.

Case: A 14 years old female patient suffering from maxillary transversal discrepancy was referred to the Gulhane Military Medical Academy, Department of Orthodontics. Intraoral examination revealed that a disharmony between maxillary and mandibular apical bone sizes cause of maxillary anterior skeletal deficiency. Lateral and anteroposterior cephalometric radiograms were obtained with Kodak 8000 Panoramic Digital System. Lateral cephalometric analysis revealed that bimaxillary prognathy with normal vertical cranial growth. The patient has also protrusive maxillary incisors and normally positioned mandibular incisors.

In the treatment procedure, it was preferred to use Fan Type Hyrax Appliance for premaxillary expansion. Fan Type Hyrax Appliance has been prepared individually in the laboratory and it was splinted on the maxillary teeth. The appliance was activated one-quarter turn twice a day (approximately 0.5 mm expansion per day). After 15 days, it was succeeded to expand the maxilla through sutura palatina media efficiently. After 3 months consolidation period, the fixed orthodontic treatment has begun. After 18 months, class 1 molar and normal overbite, overjet relationships were achieved.

Conclusion: The use of fan-type expansion can be preferred if the transversal discrepancy is related to the premaxillary region. Otherwise, hyrax expansion can also be preferred.

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Designing a New Better Orthodontic TAD System

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Purpose: To develop a new orthodontic TAD system.

Materials and methods: The designed palatal device provides orthodontic traction and allows you to change its direction in the transversal (oral) and distal direction. The design is fixed on dismountable titanium mini-implants with a square internal interface for a screwdriver. The middle part of the construction allows the use of 2 or 3 mini-implants. Cantilevers used for the application of ligatures or elastic ties can be bent in the plane of the hard palate.

The CAD-system SolidWorks was used in the development of the device. This involved mathematical modeling of the conditions of the upper jaw with implants placed and a fixed platform.

A study of the stress-strain state of the bone-implant fixation was performed to compare the various quantity of mini-implants. Orthodontic forces were applied at 45 and 90 degrees to the plane of the cantilever with a strength of 50–150 g.

Results: When fixing into two implants their heads deformed by 0.097 mm, which is several times greater than fixation with three bearing points (0.035 mm).

Conclusion: The device stability when fixed on three mini-implants is increased by up to 25–30% under external loads. Use of the designed structure provides a solution to fairly complicated clinical cases which require anchorage and the en masse retraction of the upper jaw forward.

Theme: Preventive Dentistry: Periodontology

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Effect of Chronic Periodontitis Oxidant and Antioxidant Status in Patients with Familial Mediterranean Fever

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Aim: Familial Mediterranean fever (FMF) is a self-limiting autosomal recessive disorder characterized by recurrent attacks of fever and inflammation in the peritoneum. The aim of this study was to investigate the impact of periodontal status on oxidant-antioxidant status in chronic periodontitis patients with FMF and response to nonsurgical periodontal therapy.

Methods: Data were obtained from 13 FMF patients with generalized chronic periodontitis (FMF-CP), (five female, eight male; mean age 35.08 ± 10.93) from 15 systemically healthy with generalized chronic periodontitis (CP) (nine female, six male; mean age 38.80 ± 4.87) and from 15 systemically and periodontal healthy controls (HC) (eight female, seven male mean; age 37.33 ± 5.67). Total oxidant status (TOS) total antioxidant status (TAS) and oxidative stress index (OSI) were recorded in gingival crevicular fluid (GCF) and serum. Probing depth, clinical attachment level, gingival and plaque indices were also measured. The GCF and clinical parameters were recorded at baseline and 6 weeks after periodontal treatment.

Results: The baseline GCF-TOS and OSI levels were significantly higher in CP group compared with FMF-CP group (p < 0.05). After periodontal treatment, the GCF-TOS level was significantly reduced in FMF-CP group (p < 0.05). GCF-TAS level in FMF-CP group was significantly higher than the HC group at baseline (p < 0.05). Serum-TAS levels in the FMF-CP group was significantly higher than those of the CP and HC groups at baseline (p < 0.05).
Conclusion: The results of study showed that patients with FMF-CP using colchicine reduced oxidative stress and increased antioxidant status compared to CP and healthy controls.

P399
Effect of Mouthrinse on Incidence of Preterm Low Birthweight Babies
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Mean plaque index (PI) has been shown to be associated as a risk factor of preterm low birth weight (PTLBW) babies.

Aim: To determine if plaque reduction by adjunctive use of an essential oil mouthrinse in pregnant women after scaling will reduce the incidence of PTLBW babies.

Methods: A randomized controlled clinical trial was undertaken (Ethics Approval from Ministry of Health and Faculty of Dentistry, University of Malaya, Malaysia was obtained). Pregnant women (103), at about 8 weeks gestation attending ante-natal clinics were interviewed and examined for their periodontal status and were then alternately put into test and control groups. For both groups, periodontal therapy consisting of oral hygiene education and scaling was provided. A mouthrinse, Listerine6 to be used twice a day until delivery, was given to expectant mothers of the test group. Control subjects did not receive any mouthrinse. A second periodontal examination was performed between 28 and 30 gestational weeks for both groups. Pregnancy outcome data (gestational age at delivery, birth weight of the delivered baby and delivery complications) were collected after the delivery.

Results: Excluding dropouts, 44 tests and 43 controls were included in the final analysis. There was lower incidence of PTLBW in the rinse group (16.7%) as compared to controls (22.0%) although this was not statistically significant (p < 0.05). The Odds Ratio was 0.71 (CI: 0.24, 2.13) favouring the rinse group.

Conclusions: An essential oil mouthrinse adjunct therapy for pregnant mothers reduced the incidence of PTLBW, although not significantly in this group of subjects.

P401
Nitric Oxide as a Potential Inflammatory Marker in Gingivitis and Chronic Periodontitis: Analysis of Gingival Crevicular Fluid
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Introduction: Nitric Oxide (NO) is a diatomic free radical involved in platelet aggregation, immune regulation, vascular relaxation and inflammatory response. This feature may make it important for periodontal disease etiopathogenesis. Thus, the aim of the present study is to comparatively analyze the gingival crevicular fluid (GCF) nitrite and nitrate levels to assess the potential relationship between this biochemical parameter and periodontal disease around natural teeth.

Materials and methods: Probing depth, clinical attachment level, bleeding on probing, gingival index and plaque index were assessed. GCF samples were obtained from gingivitis, chronic periodontitis and periodontally healthy subjects, including 480 GCF samples.

Results: Total GCF nitrite levels were higher in gingivitis and periodontitis groups than control group. GCF nitrite level did not differ significantly between gingivitis and periodontitis groups. The difference in GCF nitrate level did not reach to a significant level among three study groups. The gradual decrease in nitrate/nitrite
ratio was detected with the presence of inflammation. No significant correlations were detected between the periodontal parameters and nitrite/nitrate levels in this biological fluids.

Conclusions: Within the limits of the present study it can be suggested that GCF has a diagnostic potential for nitrate/nitrate level. Nitrite is a better periodontal disease marker than nitrate and may be used as an early detection marker of periodontal inflammation.

Management of Gingival Hyperpigmentation with 980 nm Diode Laser Irradiation

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Melanin pigmentation is the result of melanin granules produced by melanocytes in the basal layer of epithelium. Various methods have been used for depigmentation, including gingivectomy, free gingival autograft, electro surgery, cryosurgery, chemical agents such as 90% phenol and 95% alcohol, CO2 laser, Nd:YAG laser, Er:YAG and diode laser.

Aim of this study: To evaluate the role of diode laser irradiation in the treatment of gingival hyperpigmentation.

Patients and methods: Fifteen patients males and females suffering from gingival hyperpigmentation in the anterior segment of the oral cavity with age range from 15 to 45, and free from any systemic diseases were included in this study. The surgical laser procedures were done under local anesthesia with the laser tip in contact with the pigmented tissue in a continuous mode until the desired depth was removed.

There was a dramatic change in the amount of gingival pigmentation immediately after the operation and during the subsequent post operative visits.

Digital examination was done to detect the improvement in depigmentation using a digital camera “Nikon cool pix L810”, and the RGB (red, green and blue) value was standardised by using ”Adobe Photoshop CS5 version” . Diode laser was used with a wavelength of 980 nm, beam diameter of 320 um and power of 3 Watts. The total irradiation time was 20 min.

Conclusion: Diode laser 980 nm is shown to be safe and effective treatment modality that provides an optimal esthetics with minimal patients’ discomfort in cases of gingival hyperpigmentation.

The Effect of Povidone Iodine on Human Beta Defensin-1 Level

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Aim: Human beta defensins (hBDs) have a strong antibacterial action against various microorganisms, especially periodontal pathogens. The aim of this study was to evaluate the effect of povidone iodine as an adjunct to mechanical periodontal therapy on human beta defensin-1 (hBD-1) levels in gingival crevicular fluid.

Materials and methods: In this study 12 chronic periodontitis patients were treated by full-mouth scaling and root planing using 0.9% sodium chloride (group 1) or 7.5% povidone iodine (group 2) for subgingival irrigation during scaling and root planing. The mean age of participants was 37.09. At baseline and 1 month after the treatment, probing depth, clinical attachment level, gingival index, and plaque index were recorded. The levels of hBD-1 in gingival crevicular fluid were measured at baseline and 1 month after the treatment using Enzyme-linked immunosorbent assays.

Results: After treatments all clinic parameters were improved, there are no difference between group 1 and group 2. Both of the group 1 and group 2 hBD-1 levels in gingival crevicular fluid were reduced after the treatment (p < 0.05). Group 2 hBD-1 levels in gingival crevicular fluid had higher reduction.

Conclusions: Human beta defensin-1 plays a significant role in the protection of periodontal tissues against microorganism. After povidone iodine irrigation hBD-1 level reduction is higher than sodium chloride. It may be because of povidon iodine antimicrobial effects.

Early Tooth Loss Due To Smoking in Local Population

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Aim: To investigate the early tooth loss due to smoking in local population in Karachi.

Methods: All patients who had detailed extraction record and demographic data collected prospectively during previous 3 years (2010–2012), at two different centers [Center I – Karachi Medical and Dental College Hospital and Center II – Fatima Jinnah Dental College Karachi] were selected. A sample of 2878 cases were matched with 2392 controls for age and gender.

Results: After adjustment for significant confounding variables the estimated probability of ever having teeth extracted in adults who have a history of smoking was high [1.54 (1.31–1.80)]. Highest prevalence of smoking history was recorded in subjects having age in between 30 and 45 years (Males 25.7%, Females 3.8%).

Discussion: The probability of tooth loss is significantly reduced in adults if smoking habits are controlled. Oral hygiene measures and education have a beneficial effect on oral health and prevention of tooth loss in adult population.
**P405**

**The Effect of Chlorhexidine-Digluconate Irrigation on Human Beta Defensin-2 Level**

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**Aim:** Antimicrobial peptides are found in the innate immune system that protects multicellular organisms from a diverse spectrum of microorganisms. In humans, human beta-defensins (hBDs) are small and cationic antimicrobial peptides that can kill a wide variety of gram-positive and gram-negative bacteria. hBD-2 is an antimicrobial peptide induced in various epithelia upon extracellular as well as intracellular bacterial challenge. Chlorhexidine-digluconate at physiologic pH, produces a cationic molecule which binds to negatively-charged bacterial cell membranes causing an alteration of the osmotic equilibrium within the cell. The aim of this study was to evaluate the effect of chlorhexidine-digluconate irrigation on hBD-2 levels in deep periodontal pockets after root planing.

**Materials and methods:** Twelve patients with chronic periodontitis participated in this study and were treated with scaling and root planing. After root planing at the same visit, pockets in one split-mouth were irrigated with sodium-chloride and the pockets in the another split-mouth were irrigated with chlorhexidine-digluconate solution. Clinical parameters were recorded at baseline and after 1 month of the treatment. hBD-2 levels in pockets were determined by Enzyme-Linked Immuno-Sorbent Assay.

**Results:** The clinical periodontal parameters were decreased after mechanical treatments (p > 0.05). The reduction of hBD-2 levels in pockets which irrigated with sodium-chloride was statistically significant than in pockets which irrigated with sodium-chloride.

**Conclusion:** After mechanical treatment, hBD-2 levels in gingival crevicular fluid were decreased. The reason of this reduction could be the effection of chlorhexidine irrigation on microorganisms in periodontal pockets. Understanding the effect of chlorhexidine-gluconat needed to work harder.

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**P406**

**Relationship between Glycemic Control and the Level of Periodontitis**

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**Aim:** To evaluate the relationship between HbA1c levels and the severity of periodontal disease in type 2 diabetes mellitus (T2DM) patients.

**Materials and methods:** A total of 135 T2DM patients over the age of 35 were included in the study. The patients were divided into two groups according to their HbA1c levels. HbA1c < 7% was regarded as “well” whereas ≥7% as “poor” glycemic control. A full mouth periodontal examination including plaque index (PI), gingival index (GI), probing depth (PD), bleeding on probing (BOP), clinical attachment level (CAL) was performed. The study design was approved by the Institute of Health Sciences, Marmara University (30112010-03).

**Results:** Periodontitis with various severity was detected among the examined population (moderate to severe) and 62 of whom were diagnosed as well- and 73 as poorly-controlled. The number of patients with poorly-controlled T2DM who had severe periodontitis was significantly higher than with well-controlled ones (p < 0.05). The mean PI, BOP, CAL and the percentage of the sites and the teeth with PD > 7 mm or CAL > 6 mm were significantly higher in the poorly-controlled than the well-controlled T2DM patients (p < 0.05).

**Conclusions:** This study within its limits reveals that poor glycemic control is associated with increasing severity of periodontitis in T2DM patients.

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**P407**

**The Effect of Testosterone on Gingival Health in Young Puberty Boys**

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**Introduction:** It is generally accepted that bacterial plaque plays a huge role in starting gingival inflammation and sex hormones are among the main promoters of this inflammation during puberty.

**Aim:** to determine the extent of gingival health among teens through examination of indices of oral hygiene and gingival status; to determine serum and salivary testosterone levels in boys at puberty age with and without signs of gingival inflammation and to determine the influence of testosterone on gingival health, followed by indices of gingival status.

**Material and method:** The study included 30 boys between the ages of 11–14 years with diagnosed gingival inflammation and an equal number of boys with no signs of gingivitis as a control group. Gingival health was evaluated through clinical examination of gingival indices. Serum and salivary concentrations of testosterone were evaluated with Testosterone RIA-DLS method.

**Results:** The results indicate the expressive signs of gingival inflammation. Determination of serum and salivary concentrations of testosterone, find out strong positive correlation between them in both mediums. Also, the same strong correlation was found comparing serum and salivary levels of testosterone with the indices of gingival status, indicating a positive correlation with all index values, especially emphasizing the influence of testosterone on gingival inflammation, plaque and calculus indices (r = 0.49–0.91).

**Conclusion:** Recent findings certainly are another direct confirmation of involvement of sex hormones in the development of gingival alterations among boys during the pubertal maturation.
**Theme: Preventive Dentistry: Public Health**

**P408**

**Tailoring of Paediatric Dental Leaflets – Views of Indian Immigrant Mothers in South Western Sydney**

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**Background:** In Australia, a wealth of dental education materials are available for carers of young children. However, limited research has been conducted into the cultural sensitivity of these materials.

**Objective:** The purpose of this investigation was to ascertain views of Hindi-speaking carers living in South Western Sydney on tailoring of dental leaflets.

**Methods:** Two bi-lingual researchers conducted in-depth face to face interviews with Hindi-speaking carers (n = 19) regarding the efficacy of commonly available health education materials produced by NSW Ministry of Health. During the interview, carers were also given a simplified version of the leaflet in English and a culturally adapted and translated leaflet for comparison. The interviews were recorded and transcribed verbatim. The data was then analysed and categorised using thematic coding.

**Results:** The vast majority of carers interviewed demonstrated a certain degree of difficulty in reading and understanding health education messages written in Hindi. A consensus was reached that the translations were accurate, however; they found reading and writing in Hindi more difficult than oral communication. It was also indicated by the carers that they preferred to receive health messages in simple English with cultural specificity or via the use of pictures.

**Conclusions:** Producers of dental health education literature should research their potential user groups more carefully and ascertain the need for translated or simplified oral health education material.

**Acknowledgements:** NHMRC (Project Grant 1033213), Sydney and South Western Sydney LHDs and NSW Ministry of Health.

**P409**

**Oral Health Knowledge, Attitude and Practice of HIV Professionals**

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**Aim:** The purpose of this study was to establish current oral health knowledge, attitude and practice of non-dental clinicians caring for people living with HIV (PLHIV) to improve oral health promotion and referrals to dentists.

**Methods:** This multi-centre study invited non-dental health care professionals working with PLHIV to complete an anonymous 18-item online survey (Survey Monkey). Descriptive statistics were completed with the Statistical Package for Social Sciences. Ethics approval was granted by the Human Research Ethics Committee South Eastern Sydney Local Health District.

**Results:** Forty-five of the 64 (70.3%) non-dental clinicians (doctors, nurses, social workers and dietitians) discussed oral health with their patients. Pain and discomfort were the most common problems discussed (88.9%) followed by oral hygiene (64.4%), with diet-related issues the least discussed (58%). Lack of confidence/knowledge; time and resources were the most common reasons for not discussing oral health with patients. Printed resources (including screening and referral tools) were wanted by 77% of clinicians to improve delivery of health outcomes for PLHIV.

**Conclusion:** This study identified current oral health knowledge, attitude and practice of non-dental clinicians caring for PLHIV. This information will guide the development of resources targeting the promotion of oral health within a non-dental health check and increase the confidence to advise on modifiable risk factors as well as promoting the increased use of an existing screening tool for oral health referral.

**P410**

**Chemotherapy and Care of Patients in Odontology**

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**Introduction:** In the treatment of malignant tumors, chemotherapy with its powerful cytostatic substances, whether alone, in combination with radiotherapy and/or tumor ablation, is a daily hospital practice for several years.

Any time, it must be acknowledged that the antiproliferative effects of these substances are characterized by a deficient selectivity for only malignant cells, and in many cases, especially if treatment is prolonged or for high doses, undesirable effects on healthy structures are inevitable. These complications are not saving the oral cavity and require specific care.

**Conclusion:** The dental surgeon has a role not only in the detection of the oral neoplasia; but also in the prevention and the treatment of the associated complications, that this chemotherapy is intended for localized cancers or situated at distance.

The work going to be presented consists, through clinical cases, to optimize the care of cancer patients (in collaboration with oncologists) before, during or after cure of chemotherapy.

- Before chemotherapy: we are going to objectify how to focus our treatment plan to maximize hygiene and oral health. This step is very essential especially when an intensive chemotherapy is planned.
Aim: During the cure of chemotherapy: it is preferable to avoid any surgery. However, in case of emergency, the treatment will be discussed with the oncologist, and in all cases it will be as conservative as possible.

Aim: After chemotherapy: we describe how to solve some persisted problems. Infection prevention and maintaining hygiene are the keys of treatment.

Materials and methods: Today, 53 different minerals are produced in the Turkish mining industry. There are numerous examples of these natural resources causing health problems or presenting health risks in different regions in Turkey.

The fluoride element is known to cause a variety of health problems including dental, skeletal, and non-skeletal fluorosis. Water is one of the sources of fluoride. In 2011, The U.S. Department of Health and Human Services (HHS) and Environmental Protection Agency (EPA) recommended the replacement of 0.7 mg of fluoride per liter of water after years. This amount replaces the current recommended range of 0.7–1.2 mg.

Results: According to the United Nations Development Program (UNDP) and the World Health Organization (WHO), fluorosis is still an endemic public health problem in Turkey, as in other 24 nations. In a recent review, 13 main regions have been identified with fluorosis problem. Research on the issue still continues, as newer studies are published. Nevertheless, there is a lack of coordination among these efforts.

Conclusion: Future studies in Turkey should be well-designed and organized, in order to capture the presence and the severity of the fluorosis issue in the regions under risk.

A Regional Perspective on Medical Geology and the Fluorosis Problem in Turkey
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Introduction: Medical geology is the science of exploring the relation between natural geological factors and health. It focuses on comprehending the influence of ordinary environmental factors on the geographical distribution of health problems. It is a broad and complex subject. Hence, it requires interdisciplinary contributions from various scientific fields.

Materials and methods: Today, 53 different minerals are produced in the Turkish mining industry. There are numerous examples of these natural resources causing health problems or presenting health risks in different regions in Turkey.

The fluoride element is known to cause a variety of health problems including dental, skeletal, and non-skeletal fluorosis. Water is one of the sources of fluoride. In 2011, The U.S. Department of Health and Human Services (HHS) and Environmental Protection Agency (EPA) proposed the recommendation of 0.7 mg of fluoride per liter of water after years. This amount replaces the current recommended range of 0.7–1.2 mg.

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Conclusion: Future studies in Turkey should be well-designed and organized, in order to capture the presence and the severity of the fluorosis issue in the regions under risk.

Oral Hygiene Education in Children with Sensory Hearing Deprivation
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Aim: The priority of modern dentistry is development effective prevention programs. Personification of hygienic education of children with sensory hearing deprivation will provide assimilation of knowledge, create manual skills hygienic oral care system and their implementation in everyday life.

To improve the effectiveness of prevention of dental diseases in children with sensory hearing deprivation, through the development and implementation of corrective methods of hygiene training and education.

Materials and methods: Hygienic education program is designed in such a way that takes into account the development of the cognitive areas in a child with hearing impairment, the prevalence of visual sensations and perceptions. The basis of hygienic education were “Lessons of health” (with sign language), plays, pantomimes, board games.

Results: Designed dental hygiene education improved index of oral hygiene in children with sensorineural hearing loss from 2.8 in 6 months by 3.0%, in 12 months by 14.5%, in 18 months by 47.9% in comparison with the original version of 1.3. Deaf children’s oral health index at the beginning of learning is defined as “poor” (2.7) in 18 months decreased to 1.5, which corresponds to
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Oral Health Care Practices of Preschool Children and Their Parents, in the Area of Athens, Greece
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Aim: The aim of the study was to investigate parents’ practices towards oral health care of their children and to create a baseline database for future evaluation of an oral health education program.

Methods-population: The “Oral Health Care through the Family” preventive program, was implemented in nursery schools of two municipalities, in Athens, Greece, from October 2011 to March 2012. The program was part of the Phase Two Live Learn Laugh project and it was a partnership between the Stomatological Society of Greece and AIM-Unilever. The partners distributed information leaflets and Dental Pass Cards to parents of 2-5 year old children and discussed prevalent oral health issues in seminars with parents and nursery staff. Prior to the seminars, a questionnaire was completed by the parents, consisting of 14 closed questions about dental visits, teeth brushing and use of fluoride toothpaste of children.

Results: A total 386 persons completed the questionnaire and 296 (76.7%) of them were women. Thirty-four percentage of the participants reported that their child have never visited the dentist and 72.8% stated that their child brushes its teeth, once a day or less. 44.3% didn’t know if daily brushing with fluoride toothpaste is harmful/helpful for the teeth and 29.3% didn’t know if they are using a fluoride containing toothpaste.

Conclusion: The findings underline the need for continuation of the preventive program, which should be focused in raising awareness towards children’s daily tooth brushing, twice a day, with fluoride toothpaste, and regular visits to the dental clinic.

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Socio-Demographic Factors and Dental Caries in an Adult Bosnian Population
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Aim: This study aimed to determine socio-demographic factors associated with dental caries in a population of Bosnian adults.

Materials and methods: A random sample of 205 (109 women) 35-44 year olds from Eastern region of Republic of Srpska, Bosnia and Herzegovina, was surveyed during 2010. Data on socio-demographic factors (age, gender, place of residence, education, personal and family income, marital status, size of household, employment status) were collected using questionnaire. Dental caries was assessed using DMFT-index and its components. Univariate and multivariate regression analyses were applied to investigate the effect of socio-demographic factors on the dental caries (the level of significance set at 5%).

Results: The mean of the DMFT was 20.3, being dominated by missing (47.3%) and filled teeth (40.1%). In multivariate analysis being female and having a higher educational attainment was related to fewer decay (p < 0.05) and missing teeth (p < 0.05), respectively. Both gender and education level was also associated with mean number of filled teeth (p < 0.05, p < 0.01, respectively).

Conclusions: Gender and education were shown to influence dental health in a population of adults in Bosnia and Herzegovina, and should be considered in assessing risk, and in planning the appropriate preventive measures.

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Improving Oral Health Care of People with Sickle Cell Disease
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Aim: This work aims to showcase and disseminate a tool used to empower such health care professional skills of basic care teams entered in family health strategy, through the promotion of practices of self-care by bearers of Sickle Cell Disease (SCD).

Methods: A health care professional team specializing in hemoglobinopathies diseases drafted a manual that contained among other information, guidelines for health education on self-care on dental health in SCD for children, adolescents, pregnant women, adults and seniors. In the period from 2008 to 2010, this manual was used as a tool for empowerment throughout the national territory health care team members involved directly or indirectly in primary care to the health of people with SCD.

Results: There was training for more than 500 health professional teams from the most varied areas of expertise. Dental caries, periodontal disease, and smoking, alcohol and use of piercings are known to be potentially capable of aggravating the SCD and therefore should be subjects for the health education of bearers of SCD by multiprofessional health care team.

Conclusion: The use of the manual as material for health education and training tool has been effective since such multi-professional skills teams were empowered to provide care to persons
with SCD which contributes to longevity and quality of life of bearers of SCD. Health professionals, especially, the professional members of the dental health teams have a decisive role in this process, given the importance of preventive measures in terms of caries and periodontal diseases.

P417
Oral Health-Related Quality of Life in Disabled Children
Spinei Aurelia
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Objectives: The aim of this paper is to assess the impact of oral cavity diseases on the quality of life in children with neuromotor disabilities (NMD) in Moldova.

Materials and methods: Clinical examination was performed on 228 children of 12–13 years old with different types of NMD, placed in specialized residential institutions for children with neuromotor and mental disabilities. The control group consisted of 243 relatively healthy 12–13 year-olds, placed in boarding schools for orphans children. The study was conducted in compliance with ethical requirements, obtaining the written consent of children’s parents or legal guardians. The DMFT index and oral hygiene status (OHI-S index) have been estimated, as well as the prevalence and severity of the impact of oral health on the quality of children’s life (Child-OIDP index).

Results: The prevalence of the impact of oral cavity diseases on children’s daily activities has enhanced severity in children with NMD and it reached 69.30%. Oral cavity diseases affected food consumption, hygiene of oral cavity, emotional stability and appearance functions. The main causes of these effects are: untreated dental caries and its complications, toothache, extraction of permanent teeth.

Conclusions: The severity of impact of dental diseases on quality of life in children with NMD depends on the severity of the neurological disorders, associated disabilities, type of child’s nutrition, dental status, quality of dental care and the implementation of preventive measures. The results of this study will be used to select the methods and remedies to prevent dental diseases in children with NMD.

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Dental Caries Severity and Body Mass Index in Kinder Garden Children, Bali-Indonesia
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Introduction: Oral disease is first rank of ten diseases that suffered Indonesian community. There are 72.1% people had caries experienced. Toothache is the main reason for work and school absenteeism, with an average of 3.86 day/year. Although not fatal, dental caries infection can impact on the growth and development of preschool children and reduce human quality of life.

Objective: To determine the correlation between dental caries severity with Body Mass Index (BMI).

Method: Cross sectional study was conducted on 150 children, aged 4–6 years, consist of 80 boys and 70 girls, in Kinder Garden, Denpasar-Bali, 2013 January. The severity of dental caries was measured by UI Dental Caries Index that was divided into eight levels and Body Mass Index measurement was done also. Data were analyzed with Independent t- test and Pearson correlation.

Results: Caries prevalence is 73.3%, the average of dmf-t: 4.33 with 37.3% children with pulp caries infections. The average of children height 111.25 cm, weight 19.49 kg, BMI 15.74 kg/m². There are significant differences of BMI between children with pulp caries infections and without pulp caries infections (p < 0.05), but there are no significant correlation between dental caries severity and BMI (p > 0.05).

Conclusion: Children with pulp caries infections have a lower body mass index than those without pulp caries infections, but severity of dental caries is no correlation with BMI.
Enamel Remineralization by Toothpastes (SEM, EDX and 3D-stereomicrographic Study)

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Aim: The purpose of the study was to examine the remineralizing potential of different toothpaste formulations when applied to demineralized enamel.

Materials and methods: The study was performed on extracted permanent molars, with the roots cut at the level of cemento-enamel junction. The coronal segments were submitted to five demineralization/remineralization cycles: demineralization was carried out by an artificial caries gel (pH 4.5) and remineralization by rubbing with toothpastes containing bioactive glass, hydroxyapatite or strontium acetate and fluoride. Afterwards, the teeth were cut in half along the longitudinal axis. The first half was imaged uncoated with FEG-SEM and 3D anaglyphs were created. The second half was cast in resin, cured, the surface of the blocks was ground flat, polished, carbon coated and analysed with a FEG-SEM (BEI). Qualitative EDX analysis was performed by collecting X-ray line-scans along the line that goes from the resin into the enamel. Semi-quantitative EDX point analysis was performed on the enamel surface to determine the elemental levels (%) of sodium, magnesium, aluminium, phosphorus and calcium. The statistical analysis was performed by one-way ANOVA and post-hoc Tukey’s HSD test.

Results: The results proved that the hydroxyapatite and bioactive glass-containing toothpastes were highly efficient in promoting enamel remineralization by formation of deposits and a protective layer on the surface of the demineralized enamel, whereas the toothpaste containing strontium acetate and fluoride had little, if any remineralization potential.

Conclusions: In conclusion, the treatment of demineralized teeth with toothpastes containing hydroxyapatite or bioactive glass resulted in repair of the damaged enamel tissue.
Materials and methods: Thirty extracted human third molars were used and the enamel surfaces were removed to expose a flat occlusal dentin surface. All the dentine surfaces were ground with 600-grit silicon carbide paper under running water. The teeth were randomly divided to two groups according to the etching procedures: I: No etching (control), II: Er:YAG laser etching with MSP mode (100 µs), III: Er:YAG laser etching by with QSP mode. Then, each group was divided into two subgroups according to bonding agents (Single Bond Universal and Clearfil S3). The teeth were restored with nanohybrid composite resin (Filtek Z550). Five 1 mm² stick-shaped microtensile specimens from each tooth was prepared with a slow-speed diamond saw sectioning machine fitted with a diamond-rim blade (n = 25 specimens). All samples were submitted to micro-tensile bond test. Statistical analysis was performed with analysis of variance followed by Tukey HSD tests.

Results: There were statistically significant differences between Er:YAG laser-etched and control groups (p < 0.05). Irrespective of the laser pulse modes one-step self-etch adhesives showed the highest μTBS to dentin in all etch groups (p < 0.05).

Conclusion: In this study the results obtained demonstrated that the μTBS of laser-etching increased the tensile bond strength of one-step self-etch adhesives. The additional application of Er:YAG laser etching while using a one-step bonding systems can be recommended to increase the tensile bond strength.

FC203
Microshear Bond Strength of Preheated Silorane-Based Composite Resin to Dentin
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Objective: To investigate the effect of preheating on microshear bond strength of silorane-based composite resin to human dentin.

Materials and methods: One hundred freshly extracted third molar teeth were randomly divided into three groups; 1. composite resins were heated to 60 °C using a heater, 2. in a refrigerator composite resins were cooled to 4 °C 3. no pre-heating or pre-cooling was performed and served as control. Each group was then randomly subdivided into four groups according to adhesives used; a. two-step total etch, b. one-step self etch, c. two-step self etch and d. a silorane adhesive system (SAS). Resin composite cylinders were formed (0.9 mm diameter × 0.7 mm length) using a siloran-based and a methacrylate-based composite resin. Microshear bond strength of each specimen was tested using a universal testing device. Statistical analysis was performed using two-way ANOVA and Chi-square tests.

Results: While the preheated groups exhibited statistically higher bond strength values than control groups (p < 0.001), pre-cooling groups exhibited the lowest bond strength. The bond strength of SE bond was higher than the other adhesive systems (p < 0.001). SAS had the highest microshear bond strength. There was no statistically significant difference in microshear bond strength between All-Bond SE and Sololond M (p > 0.05).

Conclusion: Within the limitations of the present study, preheating procedure increased the microshear bond strength of silorane-based composites as well as methacrylate-based composite resins to dentin.

FC204
Radiopacity of Flowable Composite Resins
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Aim: The radiopacity of flowable composite resins (FCRs) is an important clinical property because one of the common uses of FCR is as a liner in class I and II restorations. The aim of this study, therefore, was to evaluate the radiopacity of light-curing FCRs and to compare them with the radiopacity of enamel and dentine.
Materials and methods: Seven light-curing FCRs with a filler content by weight between 41% and 71% were investigated. Fifteen specimens of the materials with thicknesses of 2 mm were prepared and radiographed alongside an aluminum stepwedge, human enamel and dentin. Three standard occlusal radiographs for each material were taken, with exposure time of 0.32 s and focus-film distance of 40 cm. Films were processed in an automatic device, and digitized using a desktop scanner. Gray-scale values of the materials, stepwedge, enamel and dentin were measured using Image J software. The data were analysed using ANOVA and Duncan multiple range tests.

Results: The decreasing values of radiopacity of the studied materials were: G-aenial Flo (38.38 ± 1.47), Filtek Ultimate (31.88 ± 1.45), Flowline (31.41 ± 1.60), Estelite Flow Quick (31.30 ± 1.99), Leaddent Flow (31.20 ± 1.32), Supralfow (28.13 ± 0.95), and Bright Light Flow (26.61 ± 1.45). All materials, except Bright Light Flow, demonstrated significantly greater radiopacity values than 2 mm of the aluminum scale and dentin (p < 0.05). The radiopacity of only one material, G-aenial Flo, was found to be significantly higher from enamel (p < 0.05).

Conclusions: All materials had radiopacity values above 2 mm of aluminium recommended by ISO 4049.

FC205
SEM Investigation of the Enamel Surface after Laser Assisted Tooth Bleaching
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White and well aligned teeth are one of the most common demands in the dental offices. Some types of lasers can be used during the bleaching procedure.

Aim: To investigate changes of the enamel surface after bleaching with Nd:Er:YAG laser and the potential of commercial paste consisting bioactive glass for remineralization of the enamel.

Material-method: 12 extracted human teeth were divided in two groups:
I group: 6 teeth treated with bleaching gel (16% carbamide peroxide), irradiated with Nd:Er:YAG laser. Laser parameters: pulsating mode, 60 Hz frequency and 8W energy. Paste with bioactive glass was applied at the end of each treatment. Teeth were prepared with the standard procedure for SEM investigation. Each tooth was analysed with SEM.

II group: 6 teeth treated with bleaching gel (16% carbamide peroxide) and paste with bioactive glass was applied at the end of each treatment. Teeth were prepared with the standard procedure for SEM investigation. Each tooth was analysed with SEM.

Results: Application of 16% carbamide peroxide caused demineralisation of the enamel. Acceleration of the bleaching process with Nd:YAG laser caused deeper damage and demineralization of the enamel. Application of paste with bioactive glass on the enamel surface caused forming of protective layer of deposits of bioactive glass on the tooth surface in both groups.

Conclusion: Acceleration of the bleaching process with the Nd:Er:YAG laser could cause severe damage of the enamel. Remineralising pastes should be used after bleaching in order to repair the damage to the mineral tissue caused by bleaching procedures.
Aim or purpose: Periodontitis is highly prevalent in humans. As the current therapies are often inefficient, even bone grafts or growth/differentiation factors, Tissue Engineering (TE) could be an alternative. Thus, a tissue-engineered double layer scaffold (DLS) based on starch-poly-caprolactone (SPCL) enriched with adipose stem cells (ASCs) was developed for periodontal regeneration.

Materials and methods: A SPCL membrane which aims at acting as GTR barrier, and a wet-spun fibre mesh without and with osteo-conductive silanol groups were combined to obtain the DLS. DLS was characterized by Fourier Transmission Infra-red (FTIR), scanning electron microscopy (SEM), mechanical and degradation tests.

Canine ASCs were seeded/cultured onto the scaffolds and then characterized by MTS, DNA quantification, SEM, PCR and ALP quantification. The same cells were subcutaneously transplanted in mice and assessed the host response.

Ultimately, DLS were implanted in a mandibular rodent defect and compared to collagen commercial membranes. After 8 weeks, new bone formation was quantified by the Donath technique.

Results: Functionalization with silanol groups was confirmed by FTIR. DLS exhibited adequate tensile strength and degradability and provided a good support for canine ASCs adhesion and proliferation. SPCL-DLS-Si revealed higher expression of osteoblast genes. These cells also did not induce any immunogenic reaction in the host.

Histomorphometry revealed that SPCL-DLS-Si induced higher bone formation compared to collagen.

Conclusion: SPCL-DLS-Si bioactive matrix with the canine ASCs revealed good potential to be used in periodontal and bone TE strategies, and could also be proposed in non-autologous canine preclinical studies before human clinical applications.
Two Types Implant-Supported Overdenture Designs

Effect of Different Mucosa Thickness on Stress Distribution of FC210

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Objective: The aim of this study was to evaluate the effect of different mucosa thickness on the stress distribution of two implant-retained mandibular overdenture designs using photoelastic analysis.

Materials and methods: Six photoelastic models of an edentulous mandible were fabricated with solitary two implants (4.0 × 11 mm) which were placed in the canine regions. The attachment systems studied were solitary ball and locator attachments. Both ball and locator groups were include three different models which had different residual ridge height so that provided different mucosa thickness (1–1 mm, 1–2 mm, 1–4 mm). Static vertical force of 135 N was applied unilaterally (each in turn right and left side) to the central fossa of the first molars. Models were positioned in the field of circular polariscope to observe the distribution of isochromatic fringes around the implants and interimplant areas under loading. The photoelastic effects were monitored and recorded photographically.

Results: Ball attachment groups were observed higher stress values than locator groups under loading compared with different mucosa thickness each others. Both of attachment system produced the lowest stress values which had 1–1 mm mucosa thickness. The highest stress values were observed which was loaded-side implant for all groups.

Conclusion: This in vitro study suggested that the use of locator attachment could be advantageous for implant-retained overdenture with regard to optimizing stress and provide more uniform stress distribution. The thickness of mucosa influence to stress values on implants.

Effect of Insertion and Removal of Tooth Supported Overdentures on Retention Strength and Fatigue Resistance of two Commercially Available Attachment Systems

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Purpose: The main problem with semi-precision attachment retained prosthesis is that they need frequent servicing in terms of replacing the female component.

Aim: The aim of the study was to test the retention strength and fatigue resistance of Rhein OT cap and Ceka sagix attachment systems fabricated on the models.

Materials and methods: Rhein OT cap (micro) and Ceka sagix attachments were procured. Acrylic resin mandibular models fabricated with teeth embedded at overdenture positions. Bar framework with attachments were cast and cemented on the model. Denture fabricated on this model was subjected to universal testing machine (UTM Instron 5900 series) for retention and fatigue test. The retention strength was measured at various cycles namely 1440, 2880, 4320 and 5760 cycles to check for the loss of retention and development of fatigue on the basis of average number of removals and placements per day for 1, 2, 3 and 4 years respectively. The values were recorded and a graphical analysis was carried out.

Results: TWO-way ANOVA was used as part of the statistical analysis to compare the retention strength and fatigue resistance of both the attachment systems used.

Conclusion: Sagix and Rhein attachment systems showed adequate retention values up to the first 2–3 years (2880–4320 cycles), fatigue test simulating 4 years of denture insertion and removal did cause subsequent reduction in the retention values but no component fracture of attachment systems.

Effect of Laser on the Bond Strength between Zirconium-Oxide Ceramic and Dental Porcelain

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Purpose: Zirconia is a widely used strengthening core material for all ceramic systems which has advantages such as esthetics, biocompatibility and colour stability but bonding mechanism between zirconia and veneering ceramic is still unknown. The aim of this study is to evaluate the effect of Er-YAG laser on shear bond strength (SBS) between zirconia framework and porcelain.

Materials and methods: Thirty samples with three different zirconia systems (Lava, ZirkonZahn, IPS e-max Zir-CAD) (7 mm diameter 3 mm thickness) were allocated in six subgroups according to the surface treatment procedures(conventional, laser); Lava with no surface treatment(st) (LC); Lava laser (LL), Zirkonzahn with no st (ZC); Zirkonzahn laser (ZL); IPS e-max Zir-CAD with no st (IC), IPS e-max Zir-CAD laser (IL). Er:YAG laser (2940 nm, 150 mj) was used for surface treatment. All zirconia specimens were processed with IPS e-max Ceramic. SBS of specimens were tested using a universal testing machine at a crosshead speed of 1 mm/min.

Results: LC showed the highest SBS whereas ZL showed the lowest (18,965 MPa) value but the difference was not significant between subgroups (p = 0.125). The difference was statistically significant when the results were evaluated according the zirconium system
(p = 0.047). I groups exhibited statistically higher values than Z (p = 0.043). The difference between I and L were not significant.

Conclusion: As a result, type of zirconia did have an effect on bond strength between zirconia core and veneer ceramic despite of laser treatment.

FC213
Effect of the Dental Arches Morphology on the Masticatory Muscles Activities
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Aim: The aim of this study was to assess the relationship between the morphology of dental arches and masticatory muscles activities in the group of healthy volunteers with full natural dentition.

Materials and methods: Two-hundred healthy, fully dentate volunteers, Angle I class (F = 113, M = 87); 18–21 years of age were studied. To assess the masticatory system clinical examination was performed. Alginate impressions of both arches were taken and subsequently plaster models were prepared. They were morphologically analyzed. EMG of masseteres, temporales, sternocleidomasto-ides and digastricies was performed to assess their activities in central occlusion and lateral movements.

Results: The width of maxillary arch was 27.0–44.0 mm (mean 33.4 ± 2.4) measured between teeth 13–23, and 36.2–57.3 mm (mean 47.2 ± 3.3) measured between teeth 16–26; the width of mandibular arch was 17.6–32.5 mm (mean 25.7 ± 1.8) measured between teeth 33–43, and 31.1–50.0 mm (mean 42.32 ± 2.8) measured between teeth 36–46; the length of maxillary arch: mean 121.0 ± 6.0, the length of mandibular arch: mean 112.9 ± 5.7; overbite: mean 3.1 ± 1.3, overjet: mean 2.3 ± 1.0. Significant correlations were found between the length of maxillary arch and temporals muscles activity in central occlusion (r = −0.225; p = 0.025), and the length of mandibular arch and temporals muscles activity in central occlusion (r = −0.238; p = 0.028).

Conclusion: The morphology of dental arches has only limited influence on masticatory muscles activities.

FC214
Effect-of-Silane Applied to Glass-Ceramics at Different Temperatures on Surface Structure and Bonding Strength
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Aim: The aim of this study was to evaluate the effect of different surface treatments on surface structure and shear bond strength of different ceramics.

Methods: 312-glass ceramic specimens were used totally including 96 specimens for shear bond strength and 8 specimens for AFM for each ceramic systems. For shear bond strength, ceramic specimens embedded to clear acrylic resin were firstly divided into two groups according to be used resin cements and later divided into four groups according to surface treatments: G1(hydrofluoric-acid/silane), G2(silane under/in the circumstances), G3(silane alone then dried with warm air(60°C), G4(silane alone then dried with warm air(100°C). After the surface treatments, VariolinkVe- neer N and Clearfil Esthetic light cured resin cements were manipulated onto ceramic discs in all groups with compatible mold. The final stage, surface treated glass ceramic specimens were observed with SEM and AFM.

Results: Bond strength values of G1 group were statistically higher than the other groups in IPS-Empress e.max and Finesse All-cera-mic systems and bond strength values of silane dried with 100°C-warm air and G1 group were statistically higher than silane dried under/in the circumstances and 60°C warm air in Vita-In-ceram Zirkonia. While there were no significant differences in bond strength between silane dried with warm air (Group 3–4), bond strength values of silane dried with warm air (Grup 3 ve 4) are statistically higher than silane dried under/in the circumstances and lower than HF+silane group in IPS-Empress e.max and Finesse-All-ceramic specimens.

AFM and SEM images showed changes in three different glass ceramic specimens surface topography after surface treatments.

FC215
Laser-Assisted Treatment of TMD
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Summary: Introduction Recent years have dictum: “laser + TENS + Magnet = success”, but there remain many unresolved issues.

The aim of this work is to explore the possibilities for laser-assisted treatment of TMJ disorders.

Materials and methods: Objects of study: 600 patients (300 women and 300 men) mean age of 47 years. Patients are selected on the main clinical sign TMJ pain. Methods of laser therapy: PBM – Laser Acupuncture, FIFBM, Biosynergetics approach and Complex Therapeutic Program (CTP). Laser devices - Combined Low-energy diode laser system and High power diode laser system - λ = 980 nm.

Evaluation of results: A specific diagnostic approach under the Signal Detection Theory is applied.

Results and discussion: The results of the theoretical and practical studies on the effect of laser irradiation in the case of TMJ disor-ders show high therapeutic efficacy of combined laser therapy. Randomised clinical observations confirm that TENS is a door for red acupuncture and low intensity red laser radiation is a gateway for infrared laser light.

Conclusions: Laser - assisted treatment of TMJ disorders has a high therapeutic efficacy and can find wide application in daily dental practice. The author offers its own original method for the treatment of acute and chronic disturbances in the TMJ - a Complex Therapeutic Program.
Prevalence of Temporomandibular Joint Disorders among the Dental Students
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Aim: The aim of the study was to evaluate the prevalence and severity of temporomandibular disorders (TMD) among to students who were in Marmara University Faculty of Dentistry class 1 and 2.

Materials and methods: Information about the symptons of TMD and the possible risk factors were collected using standardizated Research Diagnostic Criteria for TMD (RDC/TMD) Axis I and II. In this study 140 Students were examined (60 male and 80 female) with an age range from 18–23 years. The prevalence and severity of TMD was determined using RCD/TMD scoring and assessment.

Results: The results of the present investigation showed that pain in cheeks (masseter religons) was the most prevalent symptom whereas locking of the temporomandibular joint (TMJ) was the least prevalent. Nearly two-third of the examined samples (66.4%, 93/140) had no symptons of the TMD whereas 33.6% (47/140) had at least one symptom. It was interesting that bruxism was common habit among the students.

Conclusion: A low prevalence TMD was found in this student populations, but the bruxism was common which help the signify the role of stress and/or progression of TMD.

Micro CT Evaluation of Air Bubbles in Luting Cements after Cementation
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Aim: To evaluate air-bubble volume and localization in cements under fixed dental prosthesis using micro computed tomography (CT).

Material-Method: Seventy seven sound molars were circumferentially prepared in order to receive all-ceramic crowns. IPS e.max ceramic copings were fabricated according to the manufacturer’s instructions. Eight different resin based (Variolink II, Rely X ARC, Clearfil Esthetic, Bis Cem, Rely X U 100, Panavia EX, Super Bond C&B, and Multilink Automix) cements, one resin modified glass ionomer (Ketac Cem Plus), one glass ionomer (Ketac Cem), and one polycarboxylate (Durelon) dental-luting cement was used. Each specimen was scanned with a Micro CT (SkyScan). Statistical analyses were performed using the Kruskal–Wallis 1-way ANOVA and Bonferroni’s adjusted Mann-Whitney U tests.

Results: Multilink Automix and Ketac Cem Plus contained at least air bubbles (p < 0.001). Variolink II demonstrated no significant difference in the amount of air bubbles compared to Multilink Automix and Ketac Cem Plus (p > 0.05). However, the volume and surface area of the air bubbles found in the other tested luting cements was significantly greater than that of Multilink Automix, KetacCem Plus, and Variolink II (p < 0.001), all of which demonstrated no significant differences (p > 0.05).

Conclusion: The liquid and powder forms prepared by manually mixing cements were found to cause more air bubbles. The paste form of the resin based luting agents has the potential to decrease the formation of air bubbles under the complete ceramic crown.

A Comparison of Accuracy of Four Different Impression Materials
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Aim: The purpose of this study was to compare the marginal accuracy of metal casts processed with four different impression materials.

Methods: An extracted premolar tooth was prepared with a 1 mm circumferential chamfer finishing line. Stone casts of this master model were produced by four different impression materials: Speedex (Coltaine/Whaledent, Switzerland), Zhermack Elite HD (Badia Polseine, Rovigo, Italy), Affinis Precious (Coltaine/Whaledent) and Pentamix (3M ESPE, Seefeld, Germany). For every impression group, 20 metal copings (Remanium CS, Dentaurum, Germany) were produced. A light body silicone impression material (Zhermack Elite HD fast set) was used for the replicas of the tooth-metal coping space. Overall 12 measurements per replica were made under a light microscope (X40) by Leica QWin image analysis software, in order to assess the vertical marginal gap. After normality (Kolmogorov-Smirnov) and homogeneity (Levene) tests, marginal accuracy measurement mean values were submitted to one way analysis of variance (ANOVA) and in case of significant, further statistical analyses were performed by Tukey multiple comparisons test (alpha = 0.05).

Results: The mean vertical marginal gaps were found 118.1 μm in Speedex, 117.43 μm in Zhermack, 88.7 μm in Affinis and 157.07 μm in Pentamix groups. The Affinis group had the smallest (p = 0.00) and the Pentamix group had the highest marginal gap value (p = 0.00) between the test groups. Speedex and Zhermack groups did not differ significantly (p = 0.83).

Conclusion: Affinis impression material seemed to have more accuracy than the other elastomeric impression materials whereas, Pentamix was found to be less accurate.
The root canal was irrigated and blood clot, PRP, and PRF were used for further disinfection and the access cavity was sealed with temporary restorative material. Patient were recalled for evaluation after 6 and 18 months of placement of scaffold.

**Result:** PRF showed significantly better results in terms of periapical healing, root lengthening, and dentinal thickening when compared to PRP and blood clot in inducing apexogenesis in immature teeth.

**Conclusion:** Revascularization is a biologically based, more effective and conservative approach over apexification for necrotic immature permanent teeth. Platelet rich fibrin is a storehouse of growth factors which are released in a slow and continuous fashion thus improving their usefulness in the regenerative procedure, however its use in human clinical studies in the field of regenerative endodontics has been very limited. In this study, Platelet rich fibrin, as a scaffold, shows higher potential for regeneration, as compared to platelet rich plasma and blood clot.

**Materials and methods:** Necrotic immature permanent anterior teeth were selected and randomly divided into three groups. Under rubber dam isolation, access cavity was prepared. Minimal filing and copious irrigation with 2.5% sodium hypochlorite solution was done. Triple antibiotic paste was placed in dried root canals as scaffolds and placed in dried root canals in different patients. Access cavity was then sealed with adhesive restorative material. Patient were recalled for evaluation after 6 and 18 months of placement of scaffold.

**Methods & Treatment:** A young lady age 32 years came with avulsed tooth no 11 since 7 days extraorally. Tooth washed with chloro hexadine gluconate 20%, instrumentation & obturation using glass inomer cement & honey sidr covered the tooth before replantation. Fixation using composite with adjacent teeth and course of augmentin 375 mg tds, analgesic sos, mouth wash for 5 days.

**Results:** Follow up for the case 3 & 6 years, showed clinical and radiographic success since no apical or cervical resorption shown.

**Discussion:** Knight etal 1964 reported that, treated pulp in dogs showed better tissue acceptance while untreated not, Andreasen1981 in the contrary, reported that, inflammation of root resorption increases with increased extra oral time.

**Conclusion:** Multiple factor responsible for the success or failure of Replantation depends on material of obturation, honey during Replantation, fixation, with this case & care from the Pt.

**Aim:** Unexpected file separation is a major limitation of nickel-titanium rotary files. The self-adjusting file (SAF) has been claimed to be highly resistant to file separation, based on laboratory studies. The aim of this survey was to establish the frequency of SAF file separation during clinical use and to study the retrieval or bypass methods that have been used by operators in such cases.

**Materials and methods:** A questionnaire was sent to SAF users to make the following inquiries: (a) How many SAF files had they used so far? (b) How many cases of SAF file separations had they encountered? (c) How many of the separated files were retrievable? (d) How many of the non-retrievable separated files could be bypassed? Only responses from operators who had used 50 SAFs or more were included in the present study.

**Results:** The questionnaires received from 15 SAF users fit the inclusion criteria. These operators had used between 50 and 550 SAFs each. A total of 2517 SAFs had been used by these operators, and 15 cases of file separation had occurred (0.6%). Twelve of these separated files (80%) could be retrieved using Hedstrom files. In the three cases in which the separated file could not be retrieved, the separated file segment was successfully bypassed. The treatment was completed, and the canal was obturated through the separated SAF.

**Conclusions:** The incidence of SAF file separation in clinical use was very low, and in all such cases, the separated file was either retrievable or could be bypassed.
Management of Pulpless Teeth with Immature Apices – A Clinical & Radiographic Study
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Aim: Aim of Study: To clinically and radiographically evaluate the periapical healing/maturogenesis in endodontically treated teeth with immature apices by calcium hydroxide, mta & revascularisation procedure.

Methodology: Twenty-two cases of nonvital teeth with immature roots were selected. After working length determination canals were prepared with hand instruments, irrigated with 3% sodium hypochlorite & dried. In 10 cases apexification was done with mta, 10 cases were completed using calcium hydroxide and in two cases maturogenesis was attempted by revascularization.

Results: All teeth were evaluated after 1 week, 3 months & 6 months interval. After 1 week all teeth were asymptomatic and sinus was completely healed. After 3 months 100% of mta cases showed good calcific barrier formation & osteogenic repair while 80% of calcium hydroxide cases showed peri-apical repair after 6 months to a period of more than a year and 50% of revascularization cases showed root development after one year.

Discussion: Management of nonvital teeth with immature apices has always been a challenge. Earlier such cases were managed with multiple appointments using calcium hydroxide, hoping for creation of calcific barrier against which permanent filling could be placed. But in this way treatment may take more than a year. Currently mta has proved to be a better solution for apexification & successful periapical healing as an alternative in a relatively short period of time with favorable histological response. The recent concept of revascularization is a new hope for apexogenesis but only few cases have shown promising results so further research is needed in this regard.

Tooth Discoloration Induced by Different Dental Materials
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Aim: The aim of this study was to evaluate the discoloration of tooth caused by different dental materials.

Materials and methods: The 45 mature extracted teeth were separated into eight experimental groups (1 group = 10 teeth) and a control group consisted of five teeth. Five teeth of each experimental group were filled over CEJ and five other teeth bellow CEJ. As a materials were used: group 1: Endomethasone (Septodont- France), group 2: AH26 (Topseal® Integral set, A0900, Dentsply - Maille), group 3: Canason (Vocco, Germany) and group 4: Apexit (Ivoclar, Vivadent). Group control teeth were filled with saliva. After the canals were obturated they were closed with temporary filling (J-Pro-Europe). Than tooth were placed on tube-test Ependorf. The teeth color was measured with a spectrophotometer Vita Easyshade® (Germany), prior to the endodontic treatment (baseline) after 24 weeks and 1 year. The CIE L* a*b* system was used.

Results: With T-test have not gained significant difference in yellowness between groups and control groups in any of the weeks (p > 0.05) with the exception of group 5 with the control group after one year (p < 0.03).

Conclusion: The degree of lightness after a year have gained significant difference between group 1, 2, 5, 6, 8 and control group (p < 0.01).

All sealers caused a degree of tooth discoloration which increased with time. It was concluded that Endomethasone may cause discoloration of teeth, over and below the CEJ.

WaveOne NiTi Single File Reciprocating System for Root Canal Preparation
Mohammad Shamsul Alam
Bangabandhu Sheikh Mujib Medical University

FC223
The Role of Apical Surgery in Guided Tissue Regeneration
Ayse Nazli Ozgun, Ioana Pop, Cathy Bryant
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Aim: This case series aims to demonstrate the benefit of using guided bone regeneration in the management of non-healing apical pathology following conventional endodontic treatment. In cases where the periosteum overlying the bony defect is not intact, a Bio-Gide® membrane was used to prevent soft tissue ingress.

Methods: Apical surgery with the use of guided bone regeneration was performed on patients using a standardised microsurgical approach.

A three sided buccal mucoperiosteal flap was used and approximately 3 mm of the root end was resected at 90 degrees using a surgical handpiece. The defect was debridged and the root surface inspected for cracks, isthmuses, deltas and accessory canals using an operating microscope. An ultrasonic retro tip was used to prepare a 3–4 mm root end cavity which was then sealed using a mineral trioxide aggregate material. A suitably shaped membrane was then prepared and placed between the bony defect and the overlying soft tissue flap which was repositioned with 5/0 vicryl rapide vertical mattress sutures. Patients were reviewed post-operatively to assess healing.

Results: The patients were asymptomatic and displayed good healing on review at one week, three/six months and up to 2 years post-operatively.

Conclusion: The use of an evidence based microsurgical approach combined with guided bone regeneration may promote bony healing within an apical defect.

As well as maintaining optimal alveolar bone level, this will be advantageous even in the event of a subsequent restorative failure necessitating the removal of the tooth and its replacement with an implant retained restoration.
Introduction: The new Wave One NiTi file system is a single use, single file system designed to shape the root canal completely from start to finish. The WaveOne system is an exciting new concept in the preparation of the root canal. In most of the cases the technique only requires one hand file followed by one single WaveOne file to completely shape the canal. There are three files in the WaveOne single file reciprocating system, available in small, primary and large in sizes. The instruments are designed to work with a reverse cutting action. The specially designed NiTi files work in a similar but reversed 'balanced force' action using a pre-programmed motor to move the files in a back and forth ‘reciprocal action’. The files are manufactured with M-Wire technology improving strength and resistance to cyclic fatigue by up to nearly four times compared to other brands of rotary NiTi files. WaveOne files only shape the canal, extremely quickly in many instances, but they do not clean the root canal properly. It is the duty of clinicians and manufacturers to emphasize the role and importance of irrigation as a major determinant of endodontic success.

Conclusions: Once it is fully appreciated that shaping and cleaning the root canal system are irrevocably intertwined, then endodontics will be easier for all and available to all, and WaveOne will truly become the root-canal preparation instrument of the future.

FC226
Fracture Resistance of Flared Canals Obturated with New Obturation Materials
Aziza Eldarrat1, Salma Abdo2
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Aims of the Study: To investigate fracture resistance of root canals obturated with new Nano-Hydroxyapatite (NanoHA) sealer and different obturation materials.

Methodology: Canals of 120 roots of mandibular premolars were over prepared. Then, the roots were randomly divided into eight groups, each group 15 roots. Groups 1 and 2 were used as controls. Root canals of groups 3, 4 and 5 were obturated with Gutta-Percha/NanoHA, Gutta-Percha/NanoHA plus composite and Gutta-Percha/NanoHA plus MTA, respectively. Root canals of groups 6, 7 and 8 were obturated with Resilon/Epiphany, Resilon/Epiphany plus composite and Resilon/Epiphany plus MTA, respectively. Fracture resistance of each group was measured using the Instron machine, after measurements, the fractured root samples were examined by Micro CT Scan and SEM.

Results: Comparing the mean values of fracture resistance for the experimental groups using ANOVA test, showed a significant difference (p < 0.001) among the groups. Mean value of the fracture resistance was the highest for Gutta-Percha/NanoHA plus MTA (1.5 ± 26 KN) and Resilon/Epiphany plus MTA (1.4 ± 20 KN). Statistically, the difference was found insignificant between the two groups (p > 0.05). Micro CT Scan and SEM showed that fracture pattern for MTA groups was a vertical line fracture, whereas for composite groups was several cracks over the entire root surface.

Conclusion: The result indicates that the use of MTA reinforces flared root canals. Fracture resistance of both Gutta-Percha/NanoHA plus MTA and Resilon/Epiphany plus MTA was similar.

Nano-Hydroxyapatite sealer is economical and may be used as an alternative sealer with Gutta-Percha or Resilon plus MTA.

FC227
Evaluation of the Duration of Continuous Ultrasonic Irrigation in the Removal of Dental Debris in the Apical Third: An Experimental Study
Ibrahim Ethem Yaylali
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Aim: The purpose of the study was to evaluate the durations of continuous ultrasonic irrigation in the removal of dental debris from simulated apical holes.

Material-method: Thirty-two teeth with single root and canal were used. The teeth were randomly allocated into three groups (n = 3). The teeth were prepared to size 45/.04. After decoronation at the cementoenamel junction, three standardized holes were prepared at the apical third on the one side of the root. The holes were filled with dentinal debris and assembled again. The roots were irrigated using 2.5% sodium hypochlorite 30 s irrigation in Group 1 (n = 11), 60 s in Group 2 (n = 11), 90 s in Group 3 (n = 10) by using continuous ultrasonic irrigation. The samples were examined under 20× stereo microscope in that the amount of residual debris in the holes by using four-grade scoring. Since the data were ordinal, nonparametric Kruskal-Wallis analysis of variance and Dunn test as post-hoc analysis were used.

Results: There was significant difference between the groups (p = 0.035). Debris removal was significantly better in Group 2 and Group 3 (p < 0.001). There were no difference between Group 2 and Group 3 (p = 0.071). The percents of complete removal of the debris were 26% in Group 1, 85% in Group 2 and 86% in Group 3.

Conclusion: Under the conditions of the study, duration of irrigation should not less than 60 s. By considering the effect of sodium hypochlorite on dentin hardness, the duration of irrigation might adjust to remove more debris from the root canal system.

Theme: General Dentistry and Oral Health

FC228
Effect of Insulin Growth Factor-1 and Bone Morphogenetic Protein 2 on the Osteogenic Capability of Isolated Dental Pulp Stem Cells
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Aim: The aim of this study was to assess the effect of Insulin Growth Factor-1 and BMP2 on the osteogenic capability of isolated human dental pulp stem cells.

Methods: A population of clonogenic cells “stem cells” was isolated from the pulp tissue of adult third molar. These isolated cells were propagated in culture dishes and then characterized as being...
the correct population of multipotent cells retaining the ability of differentiation into a variety of different cell types. Pulp stem cell characterization was done through studying specific morphological appearance. Osteogenic differentiation was performed when reached 70% confluency by culturing at two different experimental conditions. In all conditions, cells were cultured in αMEM containing FBS, penicillin-streptomycin and glutamax. Differently, the first group was supplemented with L-ascorbic acid 2-phosphate, β-glycerol phosphate and dexamethasone; in the second group, BMP-2 and IGF-1 were added. Assessment of osteogenic differentiation of hDPSC was done by Alizarin red staining at days 12 and 23 and immunocytochemical assay for osteocalcin.

Results: The first and second experimental conditions were shown to induce osteogenic differentiation; however the second condition indicated much less potential. As for the immunocytochemical assay result, it has been shown that both the first and second groups expressed osteocalcin. However, degree of expression in the first group is much exceeding the expression in the second group.

Conclusion: BMP2 and IGF-1 although can induce osteogenic differentiation of stem cells however, it is not as potent as routine chemicals used to induce the osteogenic differentiation.

Free Communication Session 36 | B360 | 30.08.2013 | 09:00–11:00

Theme: Implantology: Implantology

FC229

Do we Explain “the Dental Implant” Correctly to Our Patients?
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Objective: To determine patients’ awareness, acceptance, knowledge, attitudes and perceived treatment need towards dental implants.

Methods: Patients’ awareness, acceptance, knowledge, attitudes and perceived treatment need towards dental implants as an option in replacing missing teeth were evaluated through a standardized 42-item, closed-ended questionnaire. The study group consisted of adult patients aged 18–85 years, who were referred to outpatient clinic Istanbul Medipol University School of Dentistry for dental treatment. The questions about age, gender, education level, job, monthly income and oral hygiene status were asked to determine socio-demographic characteristics. Additional questions about level of source and quality of information about dental implants, acceptability and perceived treatment need of dental implants as a treatment option were asked for variation factors. Patients’ variable factors towards dental implants were analyzed with descriptive statistics.

Results: The majority of patients stated that level of information about dental implants is intermediate level and need more information. The patients’ friends, their relatives and TV programs were main source of information about dental implants. The majority of patients stated that implants could be rejected by the body an allergic reaction for reason of failures of dental implants.

The major refugal reason of dental implant therapy were cost and lack of perceived necessity.

Conclusions: Attitudes of patients should be taken into consideration to improve patient compliance with and acceptance of this treatment modality. The awareness and acceptance of dental implants in the population might be increased by providing further and accurate information and promoting oral health in general.

FC230

The Effect of Shape Optimization of Platform Switching of a Dental Implant on Static, Dynamic and Fatigue Behavior by 3-D Finite Element Method
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Objective: The aim of this study is to select optimum design of implant-abutment connection of platform switched implants which reduce stress at the bone-implant interface by using macro design and implant-abutment connection of dental implant during the life time of a patient and to prevent failure of the implant into the bone by using optimization algorithm.

Methods: In this study, an efficient, effective and automated design strategy is proposed to select optimum design of platform switched dental implant. In this strategy, finite element analysis, Approximate model and a numerical optimization algorithm are integrated to create an automated design tool. Using this approach, shape design of the dental implant is formulated in the form of an optimization problem that can be solved easily by a conventional numerical optimization algorithm.

Results: Although stress values at bone-implant interface has decrease by increased platform switched ratio of implant, stress values the fatigue life of abutment body is infused dramatically. Optimum abutment geometry found after 50 optimization iterations. To reduce the computational cost, optimization process was limited with 50 iterations. More iteration may provide a better design. The optimum shape minimizes the stress values at bone-implant interface and maximizes the fatigue life of the abutment.

Concusion: The design of dental implant and abutment assembly are a complex process that requires close co-operation between engineering and dentistry. Solution of the optimization problem leads to the optimum design. These findings can form a base for further research such as the optimum design of dental implant.
Aim: To compare the accuracy of direct and indirect impression techniques made with angulated implants or implants placed in close proximity.

Materials and methods: Two epoxy resin definitive casts were fabricated for each impression technique with four appropriate implant analogs arranged in a linear pattern. One of the casts incorporated parallel implants positioned in a standard distance. The other was obtained by changing either the angulation of implants or the distance between them (1st implant was angulated 15o medially, 2nd, 3rd and 4th implants were parallel to each other; 3, 2, and 1 mm distance between implants). Five impressions with closed or open custom trays were made from each epoxy resin definitive cast using polyether impression material. Following the transfer of analog positions, impressions were poured with type IV dental stone. Technically proper abutments were screwed and tightened to implant analogs in both epoxy resin and stone casts. Distortions in x, y coordinates and z axis were calculated using Coordinate Measuring Machine and Profile Projector respectively. Data were analyzed by one-way ANOVA and Mann Whitney U tests (p < 0.05).

Results: No significant differences were found between the direct and indirect techniques when implants were placed parallel to each other and in a standard distance. In case of malposed implants, direct technique displayed less distortion compared to the indirect technique in horizontal (x) and vertical (z) planes (p < 0.05).

Conclusion: Direct impression technique using polyether impression material exhibited a more accurate implant transfer when angulated implants and implants in close proximity were concerned.

FC234
Strength Evaluation of Three Implant-Abutment Connection Under Compressive Loading
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Purpose: Biomechanical problems associated with dental implants have caused problems for both dentists and patients, in addition they are time-consuming and need extra cost. Screw loosening and fracture is one of these problems which we still face with it in clinical practice. The aim of this study is to better understanding of implant – abutment connection behavior in three different types of abutments in Implantium dental implant system under compressive loading.

Materials and methods: 18 implants (6 for each type of abutment) were divided in three groups (group 1: Dual abutment, group 2: Combi abutment, group 3: Direct Casting abutment). Abutments were tightened by Digital torque gauge and reverse torque values were recorded before loading. Then, a compressive load was applied to each sample, 30° off axes at the rate of 1 mm/min until the failure of sample was evident.

Results: reverse torque values were highest in group 2, followed by group 3 and both were significantly higher than group 1. (P < 0.05) the failure load difference between group 1 and 2 was not significant but both were significantly lower than group 3. (P < 0.05) in radiographic evaluation, all the samples showed deflection in the base of the abutment.

Conclusions: The more surface area in implant – abutment connection causes more adaptation between adjacent surfaces and maybe increases the cold weld probability. Separated screw in 2-piece abutment did not reduce the bending resistance in implant-abutment connection. Failure load values showed that all samples had enough strength to resist forces in the mouth.

Sinus Floor Elevation Using a Sintered, Natural Bone Mineral.

A Histomorphometrical Case Report Study

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Background: Implantological rehabilitation of the posterior maxilla often requires cranialization of the sinus floor to allow for long-term stability and permit the placement of sufficiently long implants. Well known as sinus floor elevation or sinus lift, this operation is one of the most common therapies for vertical deficits of the upper jaw.

Aim: The aim of the present study was the histological, histomorphometrical and clinical evaluation of a sintered xenogeneic bone substitute material (BEGO OSS, Bego Implant Systems, Bremen) for the indications one-stage and two-stage sinus floor elevation.

Methods: Twelve patients were included in the study, undergoing 15 simultaneous or staged sinuslift operations. Data were evaluated clinically and, for two-stage approaches, histologically and histomorphometrically after trephine harvesting during implant bed preparation.

Results: Healing was uneventful in all cases. All patients showed good hard tissue regeneration of the lateral window of the sinus. Neither resorption nor dislocation of the granular bone substitute material was observed. Radiologically, good volume stability of the graft was observed. Histologically, bone substitute particles displayed complete osseous integration in newly formed bone matrix. The proportion of newly formed bone within the graft was 25.8-49.6%, whereas the proportion of remaining bone substitute material varied from 28.6-38.5%.

Conclusion: It was concluded that BEGO OSS acts as an osteoconductive material to support hard tissue regeneration after sinus floor elevation. Showing excellent volume stability, it is integrated into newly formed bone matrix within a six-month healing period.

Labio-Lingual Dimensions Changes after Horizontal Bone Augmentation with Xenografts

Enis Fikret Ahmedi1, Walther Wegscheider2, Martin Lorenzoni2, Jehona Ahmedi4, Avni Robaj3, Fisnik Kurshumliu4, Kujtim Shala1, Teuta Bica1, Teuta Pustina1, Linda Dula1

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Aim: Horizontal dimension of Mandible are subject of change due to tooth extraction, injuries and several pathologies of crestal jaw bone. Reconstruction of horizontal defects can be managed by using several surgical procedures and implanting different materials. Aim of this preclinical study was to evaluate labio-lingual dimensional changes after horizontal bone augmentation of mandible using derivate bovine bone matrix (dibbm) with and without procine collagen membrane.

Methods: As an animal model have been used two mongrel dogs. After tooth extraction of 4th premolars and iatrogenic horizontal defect creation, with dimensions 2 × 2 × 1.5 cm, on both sides, and healing phase of 3 months, horizontal bone augmentation with dibbm proceeded. Pouch technique was used to access the defect site. On the middle portion of the flap, width of 5 mm of periosteum was striped vertically. Using split mouth design, right side was covered with procine membrane and the left side left without. Impressions with Polyether impression material were taken in two different stages: 3 months after defect creation and 3 months after bone augmentation procedures. Values of labio-lingual dimensions based on same referent points on both stages were measured.

Results: There was dimensional improvement between stages (after bone augmentation) but with no statistical significance between right and the left side within the same stage and sample.
Intra-Oral Halitosis Patients with Dental Implants
Anna Voronina

**Aim:** Goal of research is to study morbidity of intra-oral halitosis of patients with dental implants.

**Materials and methods:** The Dental Clinic of Donetsk National Medical University carried out examination of 59 patients aged 55–65 with fixed dentures: 27 patients had implant-supported fixed dentures made of dental alloys (1 group), 22 patients – made of titanium BT1-00 (2 group).

Hygiene assessment of mouth cavity was conducted using the hygiene index OHI-S (1964). Halitosis was diagnosed by gas-liquid chromatography on volatile sulfur compounds concentration in expired air.

**Results:** Patients with implant-supported fixed dentures made of dental alloys have oral hygiene deterioration - hygiene index range amounted to 1.03 - 0.14. In the group of patients with implant-supported fixed dentures made of titanium hygiene index range amounted to 1.03 ± 0.11. A correlation relationship between oral hygiene rate and halitosis degree has been traced. Sulfur compounds were detected in the first group at 0.14 ppb; in the second group – 21.4 ppb.

**Conclusions:** Patients with implant-supported fixed dentures made of dental alloys have unsatisfactory mouth cavity hygiene and a high concentration of volatile sulfur compounds. Patients with implant-supported fixed dentures made of titanium have normal hygiene index and halitosis rate.

Difficult Cases and their Clinical Solution
Dr. Walid Khalid Odeh

**Introduction:** In some clinical cases in our daily practice we might face bone deficiency to replace missing teeth with dental implants instead of doing second surgery and bone augmentation. We can be more conservative depending on orthodontic means such as extrusion of hopeless teeth in other cases we can use mini implants to adjust complicated orthodontic cases and surgical cases such as skeletal openbite or interocclusal space deficiency. This lecture for Implantologist, Orthodontist & General practitioner. In this lecture I will talk about clinical cases to show the interrelation between ortho & implant solving clinical cases with no surgery.

**Cases:**
1. 1st will cover extrusion of hopeless anterior centrals to correct bone level before replacing them with dental implant instead of bone augmentation.
2. 2nd to gain more interocclusal space by intrusion of opposite posterior teeth.
3. 3rd case to correct skeletal openbite by using mini implant instead of orthognathic surgery.
4. 4th case using mini implant to align tilted teeth to provide space for implant or bridge.

Smile Analysis and Treatment Options for Gummy Smile Patients
Ahmed Korayem Abdelrahman

**Introduction:** Gummy smile is a very annoying cosmetic problem for many patients specially those who do not imagine that it is a solvable problem. Accurate smile analysis is the key for choosing the proper treatment option. In this presentation Smile Analysis will be explained for gummy smile by presentation of actual clinical cases before and after and during procedures.

**Objectives:** To evaluate the periodontal surgery and veneers combination technique in treating gummy smile.

**Materials and methods:** Smile analysis for two different gummy smile patients was applied based on smile design concepts in the literature then they were planned to be treated using periodontal surgery crown lengthening and veneers combination, one case of a porcelain veneers (E-max, Ivoclar Vivadent) and composite veneers (Artiste, Pentron) after periodontal surgery were applied documentation and evaluation for both cases based on pre and post operative x rays and pre and post operative photographs by SLR camera.

**Results:** After evaluation of the results it was found that periodontal surgery was successful to treat gummy smile giving the most esthetic results followed by porcelain (E-max) veneers.

**Conclusion:** The combination of periodontal surgery crown lengthening and veneers (porcelain or composite) has proven a good success to treat gummy smile cases.

Smile Design: Old Problem New Solutions
Mostaque H. Sattar, Mohammad Nasirul Islam

**Introduction:** Smile Designing Cosmetic dentistry is a modern art and science behind smiles. Dark and Discolored teeth, can be treated with teeth whitening by chemically activated or light activated whitening gel or even with laser, unhappy smiles, Caries, gap and fractured teeth can be managed with Direct or indirect composites and veneers, Gummy smiles can be corrected by laser. Co2 and other laser lonely can change the color of Unpleasant gum within few days, Implant and resin reinforced indirect composite can be a better options then bridge works for a missing tooth. Orthodontic can cure crowded, protrusive unhappy face. Crown can be delayed or even unnecessary if we can filled the cavity with fiber optic screw post reinforced composite after root canal treatment even in molar tooth. Some clinical cases will be presented to establish the above mentioned procedures. The patient loves new smile and teeth and feels they fit his/her personality and idea of perfection. After above mentioned procedure, we are able to correct all of the patient’s concerns and achieve a great cosmetic result depending

**Theme:** Dental Treatment & Restorative Dentistry: Esthetics
on the socioeconomic conditions of South East Asia. The procedure was smooth and predictable by following the proper protocol.

**Conclusion:** In this modern era of Dentistry, we now have the responsibility to not only diagnose and treat, but to offer solutions for cosmetic problem in a minimal invasive way. As a profession we must remember, we treat not only teeth, but also the confidence of a person to which they belong.

**Wireless Orthodontics and Flapless Dental Implants**

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**Introduction:** Wireless orthodontics used to prepare implant receptor sites, and flapless dental implants used as a minimally invasive implant surgery, are presented together as a versatile way to reduce treatment length while enhancing clinical outcome. The first clinical approach consists of a series of clear plastic removable appliances digitally fabricated that move the patient’s teeth in small increments from their original state to a final treated state. The implant space preparation with wireless orthodontics may be attractive to implant patients who would not like to have metallic braces and wires in their mouth. However, creating sufficient interradicular space for implant placement in areas where convergent roots are present and bodily movements of teeth are needed can be challenging. Clinical tips on how to overcome those problems and use wireless orthodontics successfully will be addressed. The second clinical approach is a surgical technique for implant placement that purposely avoids elevation, advancement and closure of a flap over the implant. The rationale for the flapless approach is mainly to preserve circulation to the site while minimizing the surgical procedure. Flapless dental implant also allows for good quality soft tissue to remain surrounding the emerging implant structure for optimal function and aesthetics. The step-by-step on how to use the flapless technique will be addressed.

**Conclusions:** In summary, combining those two techniques can be a predictable treatment for patients who seek high aesthetics during treatment planning and placement of dental implants.

**Theme: General Dentistry and Oral Health**

**Yoga for Dental Laboratory Technicians**

Meenaksi Verma1, Vaishali Vagdaonkar2, Aniket Gandhi2, Rahul Rao2, Rajiv Verma2, Deepak Langade3, Rahul Hegde3, Varsha Rathod4, Rajesh Kopikkar4, Parag Gangurde5, Manthan Patel2, Nikhil Mahajan2

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Advancement of technology in the scientific field of dentistry has been tremendous and the dental laboratory too has witnessed it. However technology comes with its own set of problems. Dental technicians all over the world are facing health issues, hence a study was undertaken.

**Aim:** To determine the problems faced by the dental laboratory technicians and lay down a specific yoga sadhana (yogic practices) for them.

**Method and materials:** Interviews were conducted of 25 dental laboratory technicians on a one to one basis. The information was recorded in a systematic manner as per an extensive form that contained personal or general information, medical ailments, postural ailments, stress and general fitness.

**Conclusion:** An insight into the problems of dental laboratory technicians was gained, and basic statistical analysis was performed. Problems faced by technicians were due to many reasons including wrong working postures, exposure to an environment full of suspended air pollutants like, aluminum oxide powder particles, acrylic, ceramic and metallic dust, wax and chemical fumes, long working hours, erratic timings and environment, stress due to work pressures and maintaining delivery schedules, etc.

An analysis into the problems and the convincing evidence of the healing potential of Yogic Practices made it evident that Yoga could solve many of the issues especially stress which can be tackled in a very holistic manner. Keeping this in mind specific yoga sadhana (yogic practices) was proposed.

**Theme: Dental Treatment & Restorative Dentistry: Materials**

**Cytotoxicity of Hemostatic Agents on the Human Gingival Fibroblast**

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**Aim:** The aim of this study was to evaluate cytotoxic effect of hemostatic agents on human gingival fibroblast cells by using real-time cell analysis method.

**Materials and methods:** Two hemostatic solutions, Hemoban (Sul-tan Healthcare, Hackensack, NJ, USA) and Hemosatic Solutions (W.P Dental, Hamburg, Germany) that includes mainly aluminum chloride were used with different concentration. Gingival fibroblasts
were isolated from gingival connective tissue during crown lengthening surgery of systemically healthy subjects. Gingival fibroblasts were maintained with Dulbecco’s modified eagle medium containing 10% fetal bovine serum. A real-time cell analyzer (RT-CES, xCELLigence; Roche Applied Science, Mannheim, Germany, and ACEA Biosciences, San Diego, Calif) was used to evaluate cell survival. After seeding 200 ml of the cell suspensions into the wells (10,000 cells/well) of the E-plate 96, gingival fibroblasts were treated with hemostatic solutions (1/2, 1/4 and 1/8 dilutions) and monitored every 15 min for 72 h. For the proliferation experiments, the statistical analyses used were 1-way analysis of variance (ANOVA) and Tukey HSD multiple comparisons tests.

Results: According to statistical analysis, when evaluated at 48 and 72 h, there were significant differences between the cell indexes of the control and all hemostatic agents groups (p < 0.001). Agent reduced cell index value significantly when compared to untreated control groups.

Conclusion: The results indicate that using of Hemoban or Hemostatic Solutions as astringent solutions have a significant cytotoxic effect on gingival fibroblast cells.

Free Communication Session 38 | B342 | 30.08.2013 | 11:30–12:30

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

FC244

Two-Body Wear of Five Provisional Crown Materials
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Purpose: This study investigated the resistance to wear of five different types of provisional crown material using a two-body wear simulation under wet conditions.

Materials and methods: Nine specimens of each provisional crown material (Dentalon Plus, Luxatemp, Protemp 3, and Protemp 4), with dimensions of 16 mm diameter and 3 mm thickness, were tested under wet conditions. The wear test was performed in a Chewing Simulator CS-4 (n = 9; test load: 50 N; number of cycles: 10,000, 20,000, 30,000; water for wet conditions) with steel balls used as antagonists. Wear was determined by 3D laser scanning and a surface analysis program. To detect statistically significant differences between groups, wear data after 10,000, 20,000, and 30,000 cycles were compared by analysis of variance (ANOVA), with the Student-Newman-Keuls post hoc test. The level of significance was set at 5%.

Results: One-way ANOVA detected significant differences between the provisional crown materials tested (p < 0.05). In addition, for all materials tested, except Dentalon Plus, significant differences in wear with increasing numbers of cycles were observed (p < 0.05).

Conclusion: Susceptibility to wear differs significantly between different provisional crown materials.

FC245

Vestibular Deepening with the Aid of the Diode Laser: Clinical Experiences
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Background: Vestibuloplasty is a surgical procedure for deepening of vestibular sulcus by changing the soft tissue. A various of factors such as age, physical conditions, the height of basal and alveolar bone, undesirable contours, nearness to anatomic structure (arteries, nerves), thickness of mucosa and muscles must be evaluated. Various deepening techniques have been employed. There are three techniques for vestibuloplasty: submucosal vestibuloplasty, seconder epitelization vestibuloplasty, vestibuloplasty with graft. Vestibuloplasty is a method for decreasing patient pleasure when complete dentures lose their stabilization.

Method and materials: Four patients with complain of lack of retention for their complete dentures applied to Prosthodontic Department, Gaziantep University Faculty of Dentistry. Patients evaluated and open submucosal vestibuloplasty procedure was planned. The procedure were explained to the patients clearly and consents were obtained. The diode laser was used to deepening submucosal areas without local anaesthesia. This laser beam was set at 3 W continuous mode with 300 mm diameter fiber-optic filament. Fiber-optic filament applied perpendicularly to the vestibular sulcus. Finally mucosa cleaned with saline and gauze pack. Immediately after the treatment support were provided with visco-gel and 1 week after conventional procedure for complete denture was applied.

Results: A deep vestibular sulcus for maxilla or mandibula was achieved in all patients by this kind of diode laser.

Conclusion: Vestibular deepening is sometimes necessity for complete dentures and may be achieved by using different therapeutic approaches. To resolve this condition, the use of an 810 nm Diode laser has been suggested as an alternative to conventional procedures because of providing sterile conditions, less operating time, fast healing proces and less bleeding.
visual shade selection. The percent visual–instrumental shade agreement (PVIA) was analyzed statistically considering observer population and shade guide set.

**Results:** The spectrophotometer evaluation of the Vita3DMaster shade guide revealed more accurate results than the Vita Classical shade guide. An intra-examiner agreement was observed. Results indicated that D1 and D2 demonstrated the highest PVIA for Vita Classical, P1 and P2 demonstrated the highest PVIA for both shade guides. PVIA was higher for P1 and P2. A significantly higher visual–instrumental shade agreement was demonstrated by the clinically experienced dentists, regardless of shade guides.

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**Methods:** Self administered questionnaires were distributed to two groups of subjects. Questions focused on the willingness to replace the missing teeth, the preferable methods of choice for replacement and the reasons for these choices. The first group (G-I-) was from the medical and paramedical staff work in a military hospital at Jordan Royal medical services, the dental staff was excluded from the study. The other group (G-II-) was from general population attended the dental department in the same hospital with comparable level of education. A total of 612 questionnaires were distributed, of which 533 questionnaires were returned (response rate 87.09%).

**Results:** G-I- have more awareness than G-II- to the probable causes for tooth/teeth replacement and limitation of the preferable method for replacement ($p < 0.05$). More than 80% of the participants believe that replacement of anterior teeth is more important than posterior teeth. Implants and fixed partial denture respectively was more preferable than removable prosthesis although clinically was not indicated in cases ($p < 0.05$). There was no clinical benefit from replacement of missing teeth in 33.4% while only 6% believe of this.

**Conclusion:** The prosthetic needs between medical and paramedical staff to be is better than between general populations. The demands for dental replacement by patients were significantly different when compared with the actual needs.

**Free Communication Session 39 | B343 | 30.08.2013 | 11:30–12:30**

**Theme: General Dentistry and Oral Health**

**FC249**

**A retrospective Study of Oral Lichen Planus in Adult Population in Greece**

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**Aim:** This retrospective study was undertaken to investigate epidemiological and clinical data of oral lichen planus (OLP) in patients presented at the Stomatological Clinic of the Dental Department of a General Hospital in Greece.

**Materials and methods:** Data were obtained from the evaluation of 600 randomly selected medical records. Forty-two (42) cases with undoubted diagnosis of OLP set either by clinical or by clinical and histologic criteria after a biopsy (14 cases) were analyzed.

**Results:**

Analysis showed that: 1. The occurrence of OLP in this selected sample was 7% with a female predilection (males/females = 2/3) and a mean age of presentation at 57.8 years. 81.4% of them were above 50 years of age.

2. Erosive type alone or combined with white lesions (reticular, papular or plaque) was the commonest form (24 cases) while reticular type alone was the second most common (13 cases). Buccal mucosa was the site of predilection (20 cases). Local corticosteroids and systemic steroids were used for the treatment and a 4.9 mean number of visits/per patient were required.

3. One case with erosive type of OLP underwent malignant transformation (squamous cell carcinoma).
Conclusions: 1. OLP is a relatively common mucosal disease among adult patients presented at our Clinic.
2. OLP had a female and older age predilection. Lesions had periods of exacerbation and quiescence.
3. Erosive type that causes pain and discomfort was the commonest in our sample. This type needs more frequent follow up examinations as this may develop malignant transformation.

FC250
Clinical Assessment and Characteristics of a Group of Turkish Patients with Oral Mucosal Diseases
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Objective: The purpose of this study was to assess the clinical and behavioral characteristics of a group of patients with oral mucosal diseases (PwOMD).

Study design: Sixty-four patients (43 female and 21 male, between 11 and 80 years of age) referring to an Oral Medicine Clinic were analyzed regarding their behavioral characteristics and clinical diagnoses during a 3-month period just after the initial diagnosis of OMDs. Data were collected by conducting face-to-face interviews guided by predetermined twenty-six-item-questionnaire which were analyzed statistically.

Results: The most common OMDs were recorded as benign hyperplasias (17.2%), apht/ulcer (15.6%) and lichen planus (15.6%). Females were more affected than males (p = 0.037). 90.6% PwOMD were aware of their OMDs. Smoking (34.4%) was the most common habit in the studied population with OMDs. The duration of smoking was 10.76 ± 14.80 years in males and 5.40 ± 10.11 years in females. 18.8% of the patients were drinking alcohol. Females were more frequently denture wearers than males (p = 0.001). 53.1% of PwOMD had systemic diseases and of this group 28.1% had more than one systemic disease and only 34.7% of this group stated that they were having their medication regularly. Hypertension was the most frequent systemic disease (15.6%), followed by gastrointestinal diseases (14.1%).

Conclusion: Based on the findings of this studied population, oral mucosal diseases seem to be ignored by the patients. Analysis of the data underlined the fact that there has been a lack of interest towards OMDs, behavioral risk factors for oral precancerous lesions and their general health.

FC251
Lupus Patient – The Dentist has a Very Important Role to Play
Shegufra Mohammad
Update Dental College, Dhaka, Bangladesh

Aim: Systemic Lupus Erythematosus is a chronic inflammatory multisystem disease of unknown etiology. It is an autoimmune disease where body’s immune system mistakenly attacks its own tissues, causing multi-organ inflammation and diverse clinical manifestations with domination of peripheral symmetric polyarthritis of small and large joints. Approximately 95% of lupus patients suffer from some form of oral involvement. Lupus patients suffer from the following mouth symptoms: dry mouth, cracked lips, bleeding gums, sore jaws, gingivitis (gum disease), cracked tongue, oral lesions, lichen planus, ulcers (tongue, mouth, gums and cheeks), and candidias thrush infections (yeast infections). Those patients also suffering from TMJ or oral scleroderma can have tightening of the mouth and jaw which can result in more abscesses and cavities. Patients with Sjogren’s Syndrome usually have severe dry mouth which results in massive decay, dental infections, thrush (yeast infections), and gum disease. Lupus is considered as high-risk category of disease by The American National Guideline Clearinghouse and American Academy of Dermatolo so they recommend that patients with this kind of condition require antibiotic premedication before dental treatment.

Conclusions: So the responsibility of a dental surgeon is unquestionable for the benefit of the lupus patients.

FC252
The Effect of Supersaturated Calcium-Phosphate Oral Rinse on Oral Yeasts Infection
Marinka Mravak-Stipetic1, Ivana Juricic Culina2, Johnatan Belsey3
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Aim: The aim was to investigate the effect of supersaturated calcium - phosphate oral rinse (Caphosol®) on oral yeasts in 120 patients with dry mouth.

Method and materials: In all patients (aged 67-89) unstimulated (QtS) and stimulated whole saliva (QsS) was measured. Swabs were taken from oral mucosa for yeast culture. Patients with positive yeast culture were randomly assigned into four treatment groups (study group-A and control groups- B, C, D): Group A was treated with Caphosol®, Group B with a combination of Caphosol® and miconazole oral gel, Group C with a solution of sodium bicarbonate, and Group D with only miconazole oral gel. Treatment was carried out for 2 weeks. Control yeast culture and salivary volume (QtS and QsS) were determined in each subject at baseline (0 day), after 7 and 14 days. Between-group analysis was carried by using ANOVA, followed by Tukey HSD testing for pairwise comparisons.

Results: All patients had positive yeast culture and 87.50% had hyposalivation. The increase in salivary volume was greatest in group A and significantly different compared to group C (p < 0.01) for period 0-14 days. Significant decrease in fungal infection was detected in groups A, B and D compared to group C for time period between 0-7 days and the 0-14 days. Between groups A, B and D no statistically significant differences were found.

Conclusion: Supersaturated calcium-phosphate oral rinse (Caphosol®) increases the amount of saliva and significantly reduces oral
fungal infection. In comparison with miconazole alone or in combination no significant differences were found.

FC253
Oral Health and Oral Hygiene Practices among Institutionalized Orphans, Yemen
Sadeq Ali Al Maweri, Walid Al Soneidar, Esam Halboub
Department of Oral Medicine, Sanaa University, Sanaa, Yemen

Aim: The aim of this study was to assess the prevalence of oral mucosal lesions, dental caries and oral hygiene practices among institutionalized orphan children in one of the orphanages in Sana’a, Yemen.

Methods: This cross-sectional study involved 202 institutionalized orphan children aged 6–15 years. Clinical examination included assessment of dental status using DMF/dmf index, and assessment of oral mucosal lesions using standard international diagnostic criteria and WHO codes. Demographic data and oral hygiene practices were obtained through interviewing each child using special questionnaire form.

Results: The results showed that (41.1%) of the study subjects had one or more oral soft tissue lesions. Nine types of oral mucosal lesions were reported; the most common lesions were: fissured tongue (24.3%), Herpes labials (7.9%), Fistulas (4%), geographic tongue (2.5%), and traumatic ulcers (2.5%). The results showed that 15.3% of the study subjects were caries free. Overall, dmfs, dmf, DMFS, DMFT were 4.23, 2.28, 2.73, and 2.06 respectively. The highest dmfs / dmf were found among the 9–11 years age group, while the highest DMFS/DMFT were scored by the 12–15 years age group. Unfortunately, high proportion of the subjects (44.1%) reported that they never clean their teeth, while (27.7%) reported to clean regularly and (28.2%) irregularly.

Conclusion: The findings of this study demonstrate that the institutionalized children in this orphanage have a high prevalence of oral lesions, a low prevalence of dental caries, and poor oral hygiene practices.

Free Communication Session 40 | B360 | 30.08.2013 | 11:30–12:30
Theme: Implantology: Oral Surgery

FC254
Platelet Rich Fibrin Membrane over Immediate Implants
Walaa Kadry Hafez, Hazem Shawky, Sameh Seif, Maha Mohamed Hakam
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Aim of the study: To evaluate platelet rich fibrin (PRF) as a membrane for coverage of immediate implants in the maxillary anterior region.

Patients and methods: Twelve implants were inserted in eight adult patients indicated for extraction & immediate implant insertion in one or more of the upper anterior teeth. A venous blood sample of 10 cc. was obtained for each single implant. After implant placement, the peri-implant defect was filled with autogenous bone (collected from the chin)-PRF mix then a PRF membrane was used to cover the implant site. The implant site was followed up clinically & radiographically immediately, 3, and 6 months post-operatively to evaluate soft tissue healing & crestal bone stability.

Results: PRF provided good soft tissue coverage over the immediate implants. Within the 6 months follow up period, the marginal bone was stable in 83% of cases. The technique was easy to perform with good esthetic results.

Conclusion: PRF could serve as a resorbable membrane for guided tissue regeneration.

FC255
Rare Case of Multifocal Papilloma Virus Epithelial Hyperplasia
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Introduction: Multifocal papilloma virus epithelial hyperplasia (MPVEH) is a rare disease of the oral mucosa associated with the human papilloma viruses (HPV) 13 and 32. It occurs at any age, but children have the highest incidence.

Purpose: To present a case of oral multifocal papilloma virus epithelial hyperplasia with palatal tumour and multiple metachronic primary cancers.

Method and materials: The medical history shows a 60 years female patient with complaints of asymptomatic mass on the palatal mucosa, with a 2 years’ development. The patient has been treated surgically for previous thyroid cancer, endometrial cancer and cancer of the mammary gland. An incisional biopsy has been performed in her left buccal mucosa 10 years ago and histopathological examination confirmed the diagnosis of MPVEN.

The palatal tumour was removed surgically by electroexcision and the histological result was pleomorphic adenoma of a small palatal salivary gland.

Conclusion: Papillomatosis is considered as a benign neoplasm with an unpredictable course and with a low probability of malignancy. We report of an unusual case of MPVEH persistent for more than 30 years without regression and with significant impact on a patient’s quality of life.

FC256
Removal of Fibromatosis Lesions Using Diode Laser (810 nm)
Two Cases Report
Bilge Yuksel Korkmaz1, Isil Kecik Buyukhatipooglu1, Fatih Sarli1, Aşihan Usumez2
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Aim: Removal of fibroma in the oral mucosa with the use of diode laser has become a common procedure for dentists and maxillofacial surgeons for preprosthetic surgery. The effectiveness of diode laser has been proven to work as well as the treatment of intraoral pigmentation, vascular lesions of soft tissues, lingual and labial frenectomy, upper and lower epulis, and gingival hyperplasia. The removal of asymptomatic fibromatosis lesions at two cases will be described and evaluated the healing of these sites after irradiation with the use of diode laser (810 nm).

Cases: In these two clinical cases, fibromatosis lesions were treated by 810 nm diode laser (Fotona, Ljubljana, Slovenia) in contact with 300 µm fiber, in continuous wave mode and were followed up their healing process during 1, 3, and 10 days. The use of diode laser reduced the operating time without using sutures and intra-operative bleeding, restricted the swelling and fastened healing without scarring. The patients had less post operative pain on the surgical sites when compared with conventional treatment.

Conclusions: The diode lasers (810 nm) are beneficial in fibroma removal treatments by reducing the bleeding and surgical time. It restricts the swelling and fastens the healing process.

FC257
Sinus Floor Augmentation using Polyethylen Glycol Hydrogel or Collagen Membrane
Laurent Ohayon
Private Practice, Saint Maur des Fossés, France

Background: Maxillary sinus floor augmentation is used to increase under sinus crestal bone height in case of important sinus pneumatization in order to allow implant insertion. The lateral Caldwell-Luc technique is used when the residual under sinus bone height is less than 5 mm. Collagen barrier membranes are most commonly used to protect the bone substitute inside the sinus bone window from connective tissue ingrowth. A new polyethylene glycol hydrogel (PEG) membrane is proposed to allow guided bone regeneration (GBR).

Aim: The aim of this presentation is to compare PEG and collagen membranes utilization protocol in case of lateral sinus floor augmentation and to analyse the histological, histomorphometric and tomodensitometric behavior of the sinus graft using the same bone substitute.

Method and materials: Presentation of several lateral bone window sinus floor augmentation clinical cases using PEG hydrogel and collagen membranes.

Description of the different protocols used for these two membranes.

Analysis of the histological, histomorphometric and tomodensitometric results using Biphasic Calcium Phosphate (BCP) graft covered by these two membranes.

Results: Six months after sinus floor augmentation surgery, histomorphometric evaluation showed 28.4% of newly formed bone and 21, 7% of remaining bone substitute using the PEG hydrogel membrane. These results correspond to the published average rate when collagen membranes were used.

Conclusion: PEG is a new barrier membrane presenting GBR properties, with specific handling due to its gel-like consistency.

FC258
The Imperatives of 3-Dimensional Implant Position in Defected Esthetic Zones
Kadhim Abul Ameer Al Himdani
French Center for Dental Implant, Sharjah, United Arab Emirates

Objectives: The objective of this study is to show our clinical experience where we obtained very satisfying esthetic results for different critical situations of bone deficiency in esthetic zones without going through sophisticated procedures of ridge management like bone augmentation, ridge splitting, and distraction osteogenesis.

Method and materials: Our clinical study comprised 98 implants placed on 60 patients in sites with bone deficiency in the anterior maxilla and mandible. Selection of proper implant macro-geometric design and size, appropriate surgical approach and procedure, manual atraumatic bone appreciation osteotomy preparation, proper implant orientation and subcrestal position, adapted prosthetic restoration specially with integrated abutment crowns are factors we considered to avoid pre-operative ridge management and bone augmentation procedures, with 3 years follow-up. Cases with sites without bone deficiency were excluded. Xenografts were used simultaneously in a few cases to give hard and soft tissue support, yet implants osseointegration was independent from the grafting material.

Results: When following our proposed criteria of implant therapy in sites with bone deficiency, survival rate of 95.9% and a success rate of 100% were reported.

Conclusion: Satisfying esthetic results in sites with bone deficiency can be obtained without pre-operative ridge management procedures. We highlight the significance of implant design, orientation and subcrestal position, surgical approach and procedure, and finally adequate prosthetic restoration and fixation. All these elements clinically proved their efficiency to overcome going through long, complicated, risky, and painful procedures. Thus achieving Minimal Invasive Implantology and shifting the conventional “Restoration-Driven Implant Placement” concept towards “Bone-Driven Implant Placement”.

Free Communication Session 41 | B342 | 30.08.2013 | 14:00–15:00

Theme: General Dentistry and Oral Health

FC259
Community-Oriented Primary Oral Health Care in Nigeria: The Abeokuta Initiative
Sherifat Omolola Quadri1, Kafayat Abdulazeem2
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Aim: The aim of this research and programme was to promote sustainable development, by fostering equitable distribution of accessible basic oral health care at affordable costs and community encouragement of self-care and to develop a replicable and
Continuous Development of an Oral Health Score for Clinical Audit
Michael Clive Busby¹, Roger Matthews¹, Elizabeth Chapple², Trevor Burke³
¹Denplan Ltd, ²OHI Ltd, ³University of Birmingham

Aim: To report on the continued development of an oral health score module designed to support general dental practitioners in monitoring oral health outcomes with their patients.

Methods: An oral health score module (OHS) was developed as part of a comprehensive on-line patient assessment tool. The other two modules in the assessment measured future disease risk and indicative capitation fee grading. The OHS was developed over 20 years of research and experience from the Oral Health Index (Burke and Wilson 1995). The online tool was piloted by 25 volunteer dentists who provided qualitative and quantitative feedback. Anonymised data from the inputs and scores generated were collected centrally and analysed for 680 recall patients.

Results: The validity of the OHS was perceived to be sound by this pilot group. The assessment data submitted confirmed an average age for the patients examined as 53 years and their average OHS to be 79.5 where a score of 100 equates to perfect oral health. A breakdown of the scores into the eight components of the OHS provided evidence of cross validation with the Adult Dental Health Survey (2009).

Conclusion: There is evidence that scoring oral health status in this manner is valid. It therefore presents valuable opportunities to audit patient outcomes progressively, either for individuals, or for groups of patients. Audit is facilitated considerably by this move from, essentially a paper based system, to an on-line tool with central data collection.

Theme: General Dentistry and Oral Health

Betel Nut Chewing Associated With Severe Periodontitis – Case Report
Dhirendra Kumar Giri¹, Pratibha P. Kundapur²
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Introduction: Betel quid chewing has been in practice among people in many Asian countries since ages. It is the most widely used psychoactive substance and an important environmental risk factor for development of oral premalignant lesions and cancer. Arecoline, the major alkaloid of areca nut, has been known to cause cytotoxicity and genotoxicity in mammalian cells in vivo and in vitro and even contributes to carcinogenicity. It also increases the risk and severity of periodontal disease.
**Case:** This paper presents a case of betel nut chewing associated with severe periodontitis in a 32 year old male patient.

**FC263**

deo2u: An Innovation in Dental Education Online

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**Aim:** Dental education has always been traditionally structured that students learn what teachers chose to teach them face to face. However, the increase in the number of dental institutions created constraints for the traditional mode of teaching. Students also have packed schedule resulting in a stressful learning environment. Available online applications have great potential to complement this mode of teaching but they are found to be not comprehensive, lacking in outcome-based-assessment and feedback. Thus, application has not been successful in getting lecturers and students to interact and the institution failed to benefit from the technology. The aim of this study was to develop a dental education online package and to assess the application

**Materials and methods:** www.deo2u.edu.my as a supplement to complement the current teaching. A learning management system i-learn available in the university was modified, developed and hosted at www.deo2u.edu.my.

**Results:** One hundred and Eighty year 1-5 dental students logged on to the website and later on assessed the website through self-administered questionnaires using Website Motivational Analysis Checklist Professional. www.deo2u.edu.my was analyzed according to its four general characteristics: engaging, meaningful, organized and enjoyable. Between 90–97% students felt that the application was meaningful, organized and easy to use with 83–88% were convinced it was attractive, interesting and fun to explore. Pleasing background was reported by 78% of the students.

**Conclusions:** www.deo2u.edu.my is an innovation in dental education online that can provide comprehensive teaching modalities made available whenever and wherever to overcome the constraints of time and limited academic resources.

**Free Communication Session 42 | B343 | 30.08.2013 | 14:00–15:00**

**Theme: General Dentistry and Oral Health**

**FC264**

Mandibular and Lumbar Bone Mineral Density with QCT in Egyptian Females

Dina Mohamed El Beshlawy1, Moshera Mohamed Dahaba2, Hala Ahmad Raafat3, Mohamed Abd El Fattah4

1Dina El Beshlawy, lecturer, Oral Radiology department, Cairo university, Egypt, 2Moshera Dahaba, Professor, Oral Radiology department, Cairo university, Egypt, 3Hala Raafat, Associate professor, Rheumatology department, Cairo university, Egypt, 4Mohamed Abd El Fattah, Associate professor, Radiodiagnosis department, Cairo university, Egypt

Osteoporosis is a skeletal disease characterized by low bone mass that was previously thought to affect the jaw bones. Aim of the study: This study was aiming to evaluate the relationship between mandibular and lumbar vertebral bone mineral densities in osteoporotic patients using quantitative computerized tomography.

**Methods:** In the current study, twenty females aged between 40 and 70 years were selected and screened by DXA scan of spine, femur and forearm. According to the resultant T-scores, they were categorized into normal group (five patients), osteopenic group (seven patients) and osteoporotic group (eight patients). The patients were further subjected to QCT examinations of both spine and mandible.

**Results:** On comparing the three groups concerning the mandibular BMD measurements by QCT, no statistically significant difference was found between the normal, osteopenic and osteoporotic groups regarding the buccal cortex, the lingual cortex or the trabecular bone.

**Conclusion:** Systemic osteoporosis is not necessarily associated with mandibular osteoporosis; consequently the disease is not an absolute contraindication for dental implants placement.

**Theme: Implantology: Oral Surgery**

**FC265**

The Phenomenon of Ectopic Eruption of the Teeth Clinical Point of View

Khaled Mohamed Mansour

Alexandria Dental Research Center, Alexandria Dental Directorate, Ministry of Health, Alexandria, Egypt

**Aim:** An ectopic tooth can be found in sites outside of the oral cavity, and can be a supernumerary, deciduous or permanent tooth. The maxillary sinus and palate are the most frequently affected sites, while the mandibular condyle, coronoid process, orbits, and facial skin are affected much more rarely. Intranasal dental eruptions are another of the more unusual ectopic teeth, which present in the nasal cavity and are quite rare. The etiology of ectopic eruption is still unclear and many theories have been suggested including trauma, infection, cyst, tumor, crowding, and developmental abnormalities. In many cases, however, the etiology cannot be identified. Ectopic eruption of teeth and may cause a variety of symptoms and complications. Clinical examination and radiographic imaging are extremely helpful in making the diagnosis. After complete evaluation, removal of the ectopic tooth is appropriate in order to prevent further complications.

**Conclusions:** The etiologic, clinical, radiographic aspects and treatment for these teeth will be discussed in this lecture.

**FC266**

The Titanium Meshes Effectiveness in Reconstructing Three-Dimensional Alveolar Defects

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Aim: This study evaluated the effectiveness of titanium mesh used with particulate autogenous and anorganic bovine bone (ABB) grafting in the reconstruction of three-dimensional (3D) alveolar ridge defects for implant-borne prosthetic rehabilitation.

Materials and methods: This retrospective study included 24 patients (mean age: 50.5 years) with varied morphological defects, treated with 34 titanium meshes and particulate bone (70:30 mixture of autogenous bone and ABB) and rehabilitated at least 8–9 months thereafter with the placement of 88 implants. Data were collected from the post-surgical period before implant placement, and the implant survival, success and prosthetic outcomes were assessed after a mean follow-up of 20 (6–48) months of prosthetic loading.

Results: Four of 34 meshes in three patients had to be removed before implant placement (11.76% total failure); 20 of 34 meshes were exposed due to soft tissue dehiscence (58.82% of complications): four (11.77%) prematurely (within 4–6 weeks) and 16 (47.05%) delayed (after 4–6 weeks), with no compromise in implant placement or prosthetic plan. None of the 88 implants was lost during follow-up (100% implant survival) and 15 implants demonstrated increased bone loss, yielding a cumulative implant success rate of 82.9%.

Conclusions: Bone grafting with titanium mesh and autogenous and ABB allows predictable implant-borne rehabilitation in morphologically varied three-dimensional defects. The high level of dehiscence that occurred 2 months post-operatively did not compromise subsequent implant-borne prosthetic rehabilitation.

Conclusions: These results suggest that the use of a Er:YAG laser is an effective method for the ablation of peri-implant mucosal hyperplasia with the avoidance of any thermal side effects to the adjacent soft tissues and implants.
Methods: A descriptive study of ‘two-group post-test experiment’ taking 37 undergraduate dental students was conducted. Group A (n = 18) received a lecture on how to write a complete prescription while group B (n = 19) served as control group. Three dental scenarios about a child, a pregnant woman and an adult man were given to write mock prescriptions (Group A (n = 54) and Group B (n = 57)). Twelve components in each hand written prescription were assessed by using WHO guidelines.

Results: The improvements (less omission errors) in eight out of twelve elements in prescriptions of Group A were found. The significant improved elements were the symbol ‘Rx’ (39.8%) (p = 0.001), prescriber’s signature (75.3%) (p = 0.001), date with prescriber’s signature (54.6%) (p = 0.001) and prescriber’s registration (30.5%) (p = 0.001). In addition, provision of elements such as ‘date of issue’ (13.9%), ‘legibility of medicine’ (7%), ‘instruction for refill’ (12%) and ‘direction to use’ (0.3%) were improved also in Group A.

Conclusion: The fifty percent prescribing skill of Group A improved due to intervening of a lecture. A specific teaching module on prescription writing is suggested to make dental graduates competent in prescription writing for the sake of well being of dental patients.

FC270
Capacity of Kenyan Health Facilities for Decentralized Dental Training
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Aim: To determine the capacity of 6 non-tertiary Kenyan hospitals as sites for decentralised dental education.

Materials and methods: A questionnaire was developed to assess the capacity of a decentralised site prior to students undertaking a clinical rotation within it. Using this, a baseline assessment of six dental departments in six health facilities that had been enrolled by the partnership for innovative medical education in Kenya (PRIME-K) as sites for training of medical students was conducted. The facilities were assessed for manpower, patient load, diversity of oral health services, basic dental equipment, continuing dental education and research using the questionnaire and key informant interviews with the heads of the dental department.

Results: All the facilities assessed had general dentists while only one hospital had two dental specialists rendering oral health care to 20–50 patients per day. Five out of the six facilities had capacity for students to gain learning experiences in greater than 60% of the clinical disciplines studied during the 3rd and 4th year of the undergraduate curriculum. All the facilities had challenges of lack of specialists, broken down dental equipment and inadequate materials. Dentists in one facility had a continuing professional development (CPD) program in oral health while those in other facilities participated in CPD programs targeting all health workers. None of the facilities had ongoing research in oral health although in one facility a proposal was being developed.

Conclusion: Five health facilities had variable capacity as sites for decentralized dental education despite major resource constraints.

FC271
Internationally Trained Dental Programs in the United States of America
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Aim: Health professionals educated outside of North America comprise an invaluable resource of expertise and manpower for many health care modalities in the United States. But in almost every jurisdiction in the USA, dentistry is controlled by a State Licensure Board, which requires a DDS or DMD degree from an accredited North American dental school in order to issue a license to practice dentistry. Dentists educated in other countries have been readily accepted in US specialty residencies and postdoctoral programs, but had no path toward full licensure to practice dentistry other than to complete 4 years of undergraduate dental school.

In response to growing issues of diversity in population and access to dental care, more than thirty US and Canadian dental schools have now begun to offer advanced standing programs which award the DMD or DDS degree to international dental graduates in an abbreviated time period. Not surprisingly, these programs have become so popular and widespread that the American Dental Education Association has created a centralized online clearinghouse for international program information and application.

Conclusion: This presentation will examine American dental schools’ international programs and their status today. It will focus specifically on the very successful UMDNJ New Jersey Dental School Internationally Trained Doctor of Dental Medicine Program and its requirements, curriculum, and experience to date.

FC272
Is evidence based practice implemented by todays’ European students?
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Aim: The aim of this study is to explore the students’ perspective of evidence-based practice and the implementation of it in the clinical practice.

Materials and methods: An anonymous questionnaire was placed online for 55 days. A statement of informed consent was included. Students from member countries of the European Dental Students’ Association were invited to respond. It included basic demographic questions, the length and year of study as well as questions about their experience and their opinion about the academic books, online scientific articles, and conferences on clinical practice, hours spent for studying at home and at the university library, possible factors affecting the treatment plan and the methods they implement when planning treatments.

Results: Four hundred twenty students replied from twenty one European countries. Thirty percent of them were fourth year students. Responses from students of different European countries didn’t vary and showed that students tend to stick to the knowledge provided by their teachers’ whether it is contemporaneous or not. Seventy nine percent of the students answered that they use Medline for acquiring useful knowledge for clinical work less than once per week which is low compared to the total number of articles published every day.

Conclusions: Evidence-based clinical dentistry for students nowadays appears to be what is taught from their teachers at the university. Thus the teachers’ role becomes crucial in order to provide knowledge that is updated and develop students’ critical thinking towards new techniques, materials and scientific knowledge on a daily basis.

FC273
Research in Evidence-Based Dentistry for the General Practice
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Purpose: This study compares assessing the quality of the evidence vs. appraising the quality of the revisions of clinical guidelines in evidence-based clinical decisions.

Methods: The reliability and the validity of the Risk of Bias tool proposed by AHRQ and commonly used in evidence-based dentistry are examined. The instrument rates the quality of the evidence along 6 domains in a dichotomous format. Inter-rater reliability (Pearson r) and coefficient of agreement (Cohen kappa) are obtained. Content validity is analyzed, and criterion validity is established against the AGREE II, a tool to appraise revised clinical practice guidelines along 27 items scored in Likert 1-7 format.

Results: Standardized readers ensure over 80% explained shared variance. Validity of the Risk of Bias instrument can only be established by examining each domain individually because of the complexity of its meta-construct. Content validity is improved by the addition of 6–10 items each domain. Reliability measures require modification of the scoring criteria to a semi-continuous scale. Criterion validity emphasize the value of the Risk of Bias instrument, and its need for further psychometric improvement.

Conclusion: The effectiveness of evidence-based dentistry as a new model for the general dentistry practice must be established. For this, the methodology for obtaining the best available evidence must be streamlined and verified. Our data are compelling in showing that the Risk of Bias tool must be further validated before it can yield evidence-based revisions of clinical practice guidelines that can be used in the practice of every-day general dentistry.

Free Communication Session 44 | B343 | 30.08.2013 | 15:30–16:30

Theme: General Dentistry and Oral Health

FC274
Patients preference according to doctors gender and age
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Background: Female doctors appear to communicate differently with their patients than male doctors, it is unclear how communication style affects patient satisfaction. Some studies have shown that female doctors spend more time with their patients than male doctors, but other studies have contradicted these results. The aim of this study was to explore and describe patients preferences about the gender and the age of doctors before and after the treatment, also their satisfaction for their treatment.

Material and methods: One hundred and thirty-nine patients participated voluntarily in this research, in University Dentistry Clinical Center of Kosovo. The patients were asked to complete a questionnaire prepared especially for this research, before entering the intervention rooms and after they had their intervention.

Results: From the total number of patients 56.8% were female. The reason they came for a check-up was pain in 54.7%. From the whole sample 67.7% had their intervention in the department of oral surgery while the other percentage had their intervention in the department of dental pathology and endodontics. Before extraction in oral surgery the most preferred gender was male with 58.1%, the extraction was performed in 52.7% from female doctors. Responses from students of different European countries didn’t vary and showed that students tend to stick to the knowledge provided by their teachers’ whether it is contemporaneous or not. Seventy nine percent of the students answered that they use Medline for acquiring useful knowledge for clinical work less than once per week which is low compared to the total number of articles published every day.

Conclusion: From our result we can conclude that the most percentage of patients visit their doctors when they are in pain. Also the patients who had extractions changed their preference according to the gender. Also to work with patients to eliminate the stigma in believing that only in male doctors can perform extraction.

FC275
Reducing the Colonization of Bacteria in Dental Unit Waterlines and Wastewaters
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Aims: The purpose of this study was to investigate the effect of an automatic adjusting of hydrogen peroxide Colloidal-Ag dose system to reduce colonization and growth of heterotrophic bacteria in dental unit waterlines and wastewaters.

Methods: Thirty dental units were included to the study; 20 units were selected for first (automatic administration) and second treatment group (manual administration) and 10 units served as controls (Group 3). Water samples were collected every week during the 10 weeks. For Group 1 and 3 the samples were collected both from DUWLs and waste waters. For group 2 only DUWLs samples were collected. They were inoculated onto various specific agar media and incubated at 28–37°C for 2–7 days. After counting the colonies of microorganisms, they were identified and the mean numbers were determined as cfu/ml. Electron microscopic analysis was also performed for detection of biofilm formation.

Results: There was no significant difference between the treatment groups’ DUWLs and had counts of less than 200 CFU/ml. A statistically significant difference in median total viable counts reduction was found between the treatment and control groups’ DUWLs for all weeks (p < 0.01). But there was no significant difference between Group 1 and control group’s waste waters.

Conclusions: The system of automatic adjusting dose of Hydrogen peroxide colloidal-Ag has been found to be effective as manual application of the material for improving the dental unit waterlines. However, none of these systems has not proved enough antibacterial effect for dental unit wastewaters.

Smoking among Dental Students in Tunisia

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The World Health Organization stated in 2008 that Tobacco is one of the most preventable causes of disability and death in the world. Facing this situation, the role of health professionals in preventing smoking is very important. However, many studies reported that the prevalence of smoking among them is the same as that of the general population.

Aim: The aim of the present study was to estimate the prevalence of smoking and to assess the behaviour, knowledge and attitudes among dental students in Tunisia concerning this issue.

Methods: A study was conducted at the School of Dentistry during November 2008 among 1123 students (777 girls and 346 boys) aged from 18 to 28 years.

Results: Nearly 14% of students were smokers (11.8% boys and 2.4% girls – p < 10–9) consuming an average of 16 cigarettes daily. The age of the first cigarette varied from 8 to 21 years (16 ± 2.3 years). Among the students smokers, 66.5% of the fathers and 3% of the mothers were also smokers.

Conclusion: In our study, the smokers’ percentage was lower than that noted in Tunisian medical students. However, the prevalence of smoking was more frequent in male as shown by many authors. Dentists can be effective in helping their patients quit smoking. The study findings revealed a critical need and opportunity to include comprehensive cessation by counselling training in the dental school curriculum.

Interdisciplinary Approaches to Diagnosis of Functional Statement of Dental System

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Aim: To find new method of diagnosis and describe main characteristics of the functional statement of the patients in dentistry.

Material and methods: Results of studies of the functional status of the dentition postural and autonomic nervous systems in 251 patients (129 men and 122 women) aged 20–60 years was carried out. All patients were precisely examined to accordance of the rules of clinical dentistry. European stabilometry variant was used for investigation postural system. Electromyography was used for examination functional statement masseter and temporal chewing muscles. Functional statement of the autonomic nervous system was estimated by electrocardiography, electrodermatography, breathing movements and fotopletismography.

Results: The patients could be distributed into two groups by the results of cluster analysis. By functional parameters, groups 1 and 2 could be defined as patients with decompensated and compensated functional status, respectively. The characteristics of the functional status of patients in the two groups are presented. Furthermore, we find some correlation between the functional parameters of the dental postural and autonomic nervous systems in each group of the patients. It supported/benefited to find new diagnostic parameters of the functional statement of patients and explain the pathogenesis influence between systems.

Conclusion: The function statement of the dental, postural and autonomic nervous system are closely interrelated and can be used as one of the most important diagnosis parameters.

Switching to CBCT: Is it Beneficial to the Dental Practitioner?

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Introduction: An overview of cone beam computed tomography (CBCT) and its role in orofacial imaging is provided, including comparison with conventional and volumetric computed tomography (CT). The results of several studies conducted at the Oral and Maxillofacial Radiology Department, where the researches were conducted, are summarized.

Using CBCT for the pre- and postoperative implant site assessment necessitates following certain protocols in order to obtain standardization and hence accurate linear and densitometric measurements of jaw bones. Such protocols were established.
The accuracy of CBCT in detecting the actual extension and location of lesions affecting the maxillofacial region as well as the perforation of cortical boundaries was evaluated.

CBCT’s ability in revealing the bony components of the Temporomandibular joint was also examined.

**Conclusion:** It was concluded that it’s essential for all dental and orofacial clinicians to be familiar with CBCT imaging. However, the responsibilities and the radiological skill levels of clinicians involved in imaging require consideration.

**Free Communication Session 45 | B343 | 30.08.2013 | 15:30–16:30**

**Theme:** Implantology: Implantology

**FC279**

**My Guiding Principles For Long Term Implant Success**

Mahmood Hussain Qureshi

*Pakistan Academy of Implant Dentistry*

**Aim:** Implantology has been filled with many diverse ideas, whims, or commercially endorsed commodities and thoughts. Over the past 60 years of implantology, more than 80% of topics, which one time were the most highly promoted, proved to be the clinical failures and are so discarded.

**Material and methods:** This presentation is designed to help create an awareness of the realities of implant treatment and to teach practitioners the simplest ways to adequately treat the most commonly encountered problems related to Implantology. Based on the presenter’s 20 years of clinical implantology practice and teaching experience, 20 guidelines will be presented to avoid most of the causes leading to implant complications and failures.

**Conclusions:** In pursuance of perfection and a comprehensive solution these fundamental steps will provide a successful long term and a predictable solution for implant placement thus gratifying our ambition of the restoration and preservation of patient’s oral soft and hard tissues to acceptable levels.

**FC280**

**Photoelastic Stress Analysis of 3 Implant Retained Mandibular Overdentures**

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**Aim:** Aim of the study was to evaluate stress distribution of three implant retained mandibular overdentures with various attachment systems.

**Materials and methods:** A photoelastic model of an edentulous mandible with three implants was fabricated with a photoelastic resin. The implants were placed interfossa region. Distal implants were set 200 inclinations corresponding to center implant. The interimplant distance among three implants was 11 mm. Three attachment systems were studied on the model: 1) Bar, 2) Bar - Ball, 3) Bar - Rk-1. 100N vertical load was applied to central fossa of right first molar of the overdentures. The stress distribution of the model was recorded photographically with circular polariscope for each design.

**Results:** The moderate stress level was observed for each design. Lowest stress was transferred to implants with bar attachment among all attachment system.

**Conclusions:** A bar with distally placed Rk-1 attachment design was transmitted less stress to implants compared to bar with distally placed attachment design. The study was shown that bar with distally placed Rk-1 attachment design is an alternative choice to bar with distally placed ball attachment design.

**FC281**

**Predictable Prognosis of Immediate Implant Placement for Retained Deciduous**

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**Aim:** This case report describes the appropriate planning prior immediate implant placement and restoration replacing retained deciduous (upper E’s).

**Methods:** Assessment of the occlusion, space distribution, surrounding soft tissue and patient’s expectation of resultant aesthetic were done prior treatment. Pre-treatment casts were made and mounted on the articulator for diagnostic wax-up and fabrication of surgical template.

The surgical template was used during the surgery to clearly locate the position of implants (occlusally and gingivally). Prosthetic stage was done using the Direct Abutment API (all parts included) till the stage of temporization. Assessment of the aesthetic and occlusion of the cemented provisional was done by keeping the provisional out of contact in all excursions. Patient reported no discomfort during the 1-week review. Further appointments were given to mould the peri-implant soft tissue before the final restoration stage. Material selection for the final restorations was cement-retained porcelain fused to precious metal.

**Results:** There are sufficient data available to support the concept that immediately restored and loaded implants for single tooth situations can achieve integration using many implant systems and protocols. Many authors have concluded that aesthetic results in immediately loaded sites are superior to that achieved with a staged approach due to the gingival architecture preservation in every stage.

**Conclusions:** Clinicians will have a higher chance of success with appropriate treatment planning, incorporating all the clinical data and understanding the limitations imposed. Selection and risk/benefit analysis for each patient prior treatment will also lead to a more predictable and desirable outcomes.

**FC282**

**Resorbable versus nonresorbable barrier with immediate implantation after functional loading**

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Aim of the study: Was to evaluate of the bone height and bone density of peri implant area with resorbable and nonresorbable barriers as guided tissue regeneration with immediate implants after functional loading under mandibular overdenture.

Materials and methods: Eight male patients (the age ranged between 45 and 60 years old) had the upper jaw was fully edentulous and the lower jaw had only two remaining canines and indicated for extractions were selected. Each patient was received two immediate implants after extraction of remaining canines and was divided into two groups. Group I: the left side was received nonresorbable barrier and Group II: the right side was received resorbable barrier. Radiographic evaluation was done for marginal bone height loss and bone density immediately after overdenture insertion and 6 months later.

Results: Mean marginal bone loss with unresorbable barriers was 0.7 ± 0.16 mm and 0.6 ± 0.1 mm with resorbable barrier with non-significant difference between two groups. There was significant increase in bone density with resorbable barrier after 6 months of functional loading with significant difference between two groups.

Conclusion: There was no difference in marginal bone height changes between resorbable and nonresorbable barriers with immediate implant under overdenture after 6 months of functional loading but bone density increased with the use of resorbable barrier over non resorbable barriers. Using of resorbable barrier with immediate implantation did not need second stage surgery for removing the barrier as with non-resorbable one.

Free Communication Session 46 | B360 | 30.08.2013 | 15:30–16:30

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

Gradual vs. Immediate Restoration of Occlusal Vertical Dimension

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Aim of Study: To evaluate clinical and electromyographic influence of gradual versus immediate increase in vertical dimension in patients with temporomandibular joint disorders.

Materials and methods: Twenty patients (with age ranged between 55–65 years) had complete denture with reduced occlusal vertical dimension and signs and symptoms related to the diagnosis of temporomandibular joint disorders. They divided into two groups, each group included ten patients. Group I: Where the occlusal vertical dimension was restored gradually 2 mm for 3 weeks, then was restored to a range of another 3 mm according to the inter-occlusal distance of each patient.

Group II: Where the occlusal vertical dimension was restored immediately to a range of 5 mm according to the inter-occlusal distance of each patient. Both clinical (using The Anamnestic Dysfunction Index A.I) and electromyographic (masseter and temporalis muscles) evaluations were carried out for every patient after 3 weeks, 2 months and 6 months and then clinical evaluation was carried out every month for other 6 months for every patient under study.

Results: Showed that, there was insignificant difference between clinical and electromyographic evaluations of the two groups for improving the clinical symptoms of TMDs, but there was significant increase in activity of the muscles at the follow up after 2 and 6 months with insignificant difference between two groups.

Conclusion: Gradual and immediate restoration of the occlusal vertical dimension could improve the clinical symptoms of TMDs at the same manner. however the immediate restoration was less time consuming and patients were less subjected to clinical procedures.
FC285

**Improve Surface Topography of Silicone Elastomer for Maxillofacial Prostheses**

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**Introduction:** Maxillofacial losses caused by trauma or postsurgical surgery are commonly replaced by silicone elastomers. The gypsum mold surface cannot be rendered smooth and this is reflected on the prosthesis surface. This high surface roughness enhances the bacterial adhesion and growth.

**Objective:** The objective of this study was to coating of gypsum mold in order to improve surface roughness of silicone elastomeric material.

**Methods:** Laboratory gypsum mold flask surface was coated by clear aerosol acrylic spray by following the manufacturer instructions. The coated molds were used to produce experimental samples of maxillo-facial silicone elastomers. The surface roughness of the newly formed silicon elastomers were compared to other samples prepared by the conventional methods by using the atomic force microscope (AFM). Scanning Electron Microscope (SEM) was used to evaluate topographical of both silicone elastomers and die stone gypsum samples. The differences in roughness between coated and non-coated mold surface were analyzed using t-test (p < 0.05).

**Results:** T-test showed that there is significant difference in the surface roughness between the silicon elastomers prepared by the conventional die stone molds and in the processed molds, (p < 0.0001). The AFM and SEM showed clear difference in the surface smoothness.

**Conclusions:** Lower surface roughness and highly smooth surface of silicone elastomers can be obtained simply by coating the die stone gypsum mold with acrylic spray.

FC286

**Panoramic Radiographic Findings of Implant-supported Mandibular Overdentures**

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**Objective:** The aim of this study was to evaluate edentulous patients with panoramic radiography who would receive maxillary complete denture opposed to two-implant-supported mandibular overdenture.

**Subjects and methods:** In this study, 197(101 male – 96 female) patients, ages ranged from 60 to 75 years, have attended the University of Ankara, Faculty of Dentistry for routine dental treatment.

A dental panoramic radiograph was taken from each patient using the same X-ray machine (Planmeca pan/ceph, Finland). Measurements on panoramic images carried out with Planmeca Romexis 3.0.0.R software. Marginal bone levels were radiographically determined at four points between the mental foramens. Additionally, the number of intrabony root remains and impacted teeth on panoramic radiographs were recorded.

The data was analyzed using SPSS for Windows Version 12.0. Analysis included freqency, cross tabulations, calculation of means Spearman’s rho. Significance was set at the 5% level.

**Results:** The number of impacted teeth observed in females and males were 5 and 7, respectively. The number of intrabony root remains was 18 for females and 11 for males. There were no significant differences in gender for the number of impacted teeth and the number of intra-bony root remains.

The mean marginal bone levels measured between the two mental foramens was 18.51 ± 4.82 mm (min:4.83, max: 29.25) for males and 15.71+4.46 (min 4.43, max 26.70) for females. There was a significant statistical difference for female gender.

**Conclusions:** Out of 197 patients 14 patients (7.1%) bone level between interforaminal areas were not suitable for two dental implant placement.

FC287

**Microhardness and Surface Roughness of Denture Teeth Stored in Various Beverages**

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**Aim:** The purpose of this study was to evaluate the microhardness and surface roughness of four commercially available denture teeth using modified acrylic and composite resin materials against various beverages.

**Method:** Conventional acrylic resin, reinforced acrylic resin, microfiller composite resin, and nanofiller composite resin teeth were used. From each group of denture teeth, 10 maxillary first molars were immersed in 5 beverages (tea, filtered coffee, cola, cherry juice, and distilled water). The test period of 24 h appears comparable to approximately 1 month of normal beverage consumption. The test periods used in this study were arranged according to this protocol and 1 week, 1 month, 3 months and 6 months of normal beverage consumptions were simulated. Vickers microhardness and surface roughness of denture teeth were measured for each test period. The differences of each value were calculated by one-way ANOVA statistically.

**Results:** The microhardness values significantly decreased in all beverages especially in 6th month (Tukey HSD test, p < 0.01). The surface roughness values significantly increased in all beverages especially in 3rd month (Tukey HSD test, p < 0.01). There were no statistically significant differences between the beverages (Friedman test, p > 0.01). Microfiller composite resin denture teeth had the highest microhardness values and the lowest surface roughness values (Tukey HSD test, p < 0.01).

**Conclusions:** Within the limitations of this study, daily intake of common beverages may change the surface characteristics and microhardness of denture teeth. To improve these mechanical and physical properties new artificial teeth have been developed by controlling the filler particles and polymer matrix.

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Shear Bond Strength of Metal Brackets to Different Ceramics
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Aim: The aims of this study were to investigate the effects of various surface-conditioning methods on the surface roughness of ceramics and on the shear bond strength (SBS) of metal brackets bonded to different all-ceramic materials.

Materials and methods: Sixty glazed feldspathic and 60 glazed IPS e-max discs were used in this in vitro study. The specimens were examined following surface-conditioning methods based on the surface treatments: Only silane, 37.5% orthophosphoric acid with silane, diamond burr with silane, 50 µm Al2O3 air abrasion with silane, 9.6% hydrofluoric acid with silane and Nd:YAG laser irradiation with silane.

Surface topographies of one specimen of each group was observed by atomic force microscopy. Surface roughness (Ra) values were measured using a profilometer. Metal brackets were bonded to the ceramic surfaces with a light cure composite. The samples were stored in distilled water for 24 h and thermocycled. The SBS of the brackets was measured with an Instron universal testing machine.

Result: For surface roughness, even as, there were no statistically differences between ceramic groups (p = 0.068), there were statistically differences between preparation groups (p = 0.000). Group sandblasting had rougher surfaces compared with those in the other groups. For SBS values, there were no statistically differences between ceramic groups (p = 0.376), there were statistically differences between preparation groups (p = 0.000). Group sandblasting had higher values than those in the other groups.

Materials & methods: Twenty-one patients (30–45 years old) consisting of 16 females and five males selected from the Periodontology Clinic of the Faculty, were randomized into three groups, seven patients in each group. Control group I patients received SRP only, test group II patients received SRP plus 300 mg of ornidazole twice daily (for 7 days), and test group III patients received SRP plus subgingivally delivered ornidazole carried upon chitosan gel after SRP. Clinical [plaque (PI) and bleeding (BOP) indexes, probing pocket depth (PPD), clinical attachment level (CAL)] and microbiological data [one-site pooled sample, processed by benzoyl-DL-arginine-naphthylamide (BANA) test] were collected at baseline, and 1, 3 and 6 months, post-therapy. Clinical variables were compared by ANOVA and microbiological variables by chi-square tests.

Results: All treatments modalities effectively reduced the signs of periodontitis. All clinical parameters and the subgingival microbiota showed significant reduction after SRP in all groups, with no significant difference between group II & group III at 1& 3 months, which become significant at 6 months in favor to group III.

Conclusions: Within the limitations of this study, the adjunctive use of systemic and local ornidazole in the treatment of chronic periodontitis demonstrated significant clinical and microbiological benefits when compared to SRP alone, and the ornidazole gel had a superior effect over its systemic form.

Theme: Dental Treatment & Restorative Dentistry: Endodontics

PD002
Determination of different EDTA Solutions on Root Dentin Tubule Penetration
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Objective: The aim of this study was to determine the effects of different EDTA solutions (EDTA, EDTA-T, REDTA) in root dentin tubule penetration.

Methods: The crowns of the 20 extracted human premolar teeth were removed and the root canals were prepared by using K files with step-back technique to the master apical file up to #50. The canals were irrigated with 2 ml 2.5% sodium hypochlorite (NaOCl) between each file size. After completion of the instrumentation, 5 ml 2.5% NaOCl was applied. All teeth were irrigated by using three different EDTA solutions as a final flush then the root canals were dried with #30 paper points. After final irrigation, each canal was irrigated with 1 ml, 0.1% RhodaminB solution. The teeth population were assigned into three groups (n = 6/group) with respect to the final irrigation technique employed: Group1: EDTA (5 ml, 17%), Group 2: EDTA-T (5 ml, 17%), Group:3 REDTA (5 ml 17%). Two teeth were assigned as negative control which was irrigated only NaOCl (5 ml, 2.5%) as final irrigation. All teeth were embedded in acrylic resin block. 1 mm thick three
horizontal sections were taken from coronal to apical and then penetration depth was analyzed using a Confocal Laser Scanning Microscope. Differences among the experimental groups were analyzed using One-way ANOVA test (p < 0.05).

**Results:** There were no significantly differences between EDTA and surfactant added EDTA solutions on dentin tubule penetration (p > 0.05).

**Conclusion:** To add surfactant to EDTA was not enhanced the penetration depth of irrigation solution.

**Theme: Dental Treatment & Restorative Dentistry: Materials**

PD003

**Microleakage Study of a Restorative Resin Through Radioisotopic Methods**

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**Aim:** The purpose of this study was to evaluate the microleakage of the dental restorations using SonicFillTM (Kerr). The null hypothesis was that the type restorative system didn’t have influence in what concerns to microleakage.

**Method and materials:** Thirty discs of GC-G-aenial and GC-Kalore nano-hybrid posterior composites (n = 5 for each group) were prepared. Specimens (6 mm in diameter and 2 mm in height) were prepared in a copper mold, covered with mylar strip and polymerized for 40 s, at 3 curing distances: 0, 2 and 4 mm, utilizing halogen (500 mW/cm²). The degree of conversion of each specimen was calculated by Fourier transform infra-red spectroscopy and values of micro-hardness were measured. The resulted data were statistically analyzed by two way-ANOVA and Pearson’s test.

**Results:** The results indicated that 1) Composite types showed insignificant difference of micro-hardness values with different curving distances; 2) at 2 mm curing distance, GC-Kalore showed significant decrease in micro-hardness values compared to GC-G-aenial (2.55 ± 0.15 and 3.05 ± 0.01 respectively); 3) GC-Kalore showed significant decrease in degree of conversion at 0 distance compared to GC-G-aenial (97.59 ± 0.10 and 98.03 ± 98.03 respectively).

**Conclusion:** Curing distances were passively affected degree of conversion of Nano-hybrid posterior composites consequently micro-hardness.

**Theme: General Dentistry and Oral Health**

PD005

**Oral Health Indicators in Changing Dental Care System**

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Republic of Belarus has a population of 9.46 million (2012). Oral health services are provided in 1717 state dental establishments by 4595 dentists (stomatologists), of which 23% full or part-time private, and by 1540 dental therapists. Number of private dental clinics has increased from 26 in 1996 to 893 in 2012. In 2012 there were 14.057 million dental visits of which 6% – to private clinics. Aim of this study was to assess possible changes one of important oral health indicator – “Reasons for seeing a dentist” – in connection with changing dental care system from public to partly private.

**Methods:** The 1996 and 2012 annual reports on oral health care delivery in Belarus were analyzed, assessing reasons for dental
visits: check-up, or cleaning (CL), routine treatment (RT), emergency treatment (ET); average number of extracted permanent teeth per one inhabitant of the country were estimated.

**Results:** In 1996 years less than 1% of total dental visits were for “CL”, 40% – for “RT”, and 59% – for “ET”; av. 0.204 teeth/inhabitant were extracted. In 2012 years “CL” visits were 4.7%; “RT” – 63.1%; “ET” – 32.2%; av. 0.168 teeth/inhabitant were extracted.

**Conclusion:** It is proposed, that the oral health indicator “Reasons for seeing a dentist” in the country is improving in recent years and this trend coincided with the raising of private sector in the predominantly public oral health care system.

**Theme: General Dentistry and Oral Health**

**PD006**

Moral Dilemmas of Greek Dentists in Care Provision

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**Aim-purpose:** To explore the knowledge, views, and possible decisions of Greek dentists in relation to ethical dilemmas encountered upon treatment of specific patient cases, such as child abuse, treatment of HIV-infected patients and handling of patient recourse to justice.

**Methods:** A self-administered questionnaire has been distributed to 230 dentists working in the capital and second biggest city of the country during May-September 2011. For adequate response, personal contact with the dentists was sought and the questionnaires were given to them during a visit by one of the authors. One week later, the completed questionnaires were collected in a closed envelope upon a new visit.

**Results:** The majority (51.6%) of the 200 dentists responded would avoid contacting the authorities for abused child and they would try to solve the problem through discussion. About 10% of the dentists would act against the patient’s interests to support a colleague, while 35% of them would avoid treating an HIV-infected patient, this avoidance being due to insufficient application of hygiene measures, as claimed by 10% of them. Almost 90% of the responders believe that <10% of mistreated patients would sue their dentists and that this reaction is best avoided if a friendly, not strictly professional, relation exists between the patient and the dentist.

**Conclusion:** A considerable number of Greek dentists express confusing aspects in ethical issues and appear to lack knowledge or will to handle certain uncomfortable situations.

**Theme: Preventive Dentistry: Orthodontics**

**PD007**

Serial Extraction in Early Treatment

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**Aim:** Serial extraction is an interceptive orthodontic procedure usually initiated in the early mixed dentition; it is designed to anticipate and minimize the development of a fully matured malocclusion in the permanent dentition, and it is accomplished by the extraction of certain deciduous and permanent teeth in an orderly sequence and predetermined pattern to guide the erupting permanent teeth into a more favourable position. It is successful if it minimizes orthodontic appliances needs. There are three possible extraction patterns, however serial extraction should be more of a series of observation and guidance with changing approaches as the patient’s orofacial complex develops. The main advantages for the patient are related to the self-esteem of children who see their teeth aligned at an early age, to the possibility to better influence growth, to an early correction of the malocclusion with a better patient’s compliance and a reduced treatment time, and to having better results with the periodontal condition of teeth erupting spontaneously in the center of the alveolar ridge.

**Conclusions:** Selection is very important for the success of serial extraction, although no exact method exists. There are many factors to be considered that help in taking a decision. Timing of the various steps is very important.

Two clinical cases are reported as an example.

**Theme: Implantology: Oral Medicine**

**PD008**

bFGF Upregulates the Expression of NGFR in PC12 Cells

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**Aim:** The reciprocal and highly regulated processes of cellular proliferation, cellular differentiation, and progression to a postmitotic state during embryogenesis generate the cellular diversity in the developing nervous system. Growth factors, in part, can regulate these proliferative or differentiation processes by analogous mechanisms. Basic fibroblast growth factor (bFGF), a member of FGF family, has broad biological functions involving the regulation of cell growth, differentiation, and proliferation. As extension and remodeling of neurites play essential roles in development and neuronal plasticity, we investigated a role for nerve growth factor receptor (NGFR) on bFGF-induced neurite outgrowth in PC12 cells. Our goal in the present study was to determine if there is a causal link between bFGF and NGFR.

**Results:** Results of these studies indicate that bFGF is required for NGFR-induced changes in morphology and transcriptional induction of the gene. We have provided convincing evidence that inhibitor of bFGF, PD173074, completely inhibited NGFR protein expression, whereas it partially blocked the NGFR protein expression in response to bFGF in PC12 cells. Another important finding of our study provides the data on the involvement of bFGF in MAPK-dependent signaling pathways and neurite outgrowth in PC12 cells, which suggests a central role of MAPK in the neuronal induction by bFGF. Taken together, these results raise the possibil-
ity that bFGF activates a MAPK-mediated pathway related to NGFR expression.

Poster Discussion Session 02 | B332 | 30.08.2013 | 15:30–16:30

Theme: Dental Treatment & Restorative Dentistry: Pedodontics

PD009
Oral Health Status of Children by Place of Residence
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Aim: Of the study was to chart the situation of oral health in Estonia during mixed dentition.

Methods: The study was carried out in southeastern Estonia among elementary school children (average age was 8.3 year) by place of residence. The schools included in the examination were randomly chosen according to the location of the school and the number of pupils (n = 485, 10% of all pupils in this area at this age). All teeth were observed and registered by ICDAS code and converted to DMFT index. The social background and the level of fluorides in drinking water were also assessed. The DMFT was calculated by the fluoride level of drinking water reflected statistically that bFGF activates a MAPK-mediated pathway related to NGFR expression.

Results: The mean DMFT index was 0.97 and DMFS 1.62 in permanent dentition; the same numbers in mixed dentition were accordingly 5.93 and 11.86. Children residing in rural areas (presumably in families with lower income) and studying in smaller schools had a higher number of caries lesions and a lower number of fillings in the permanent dentition. There was no statistically significant difference between the groups in the mixed dentition. Analyzing the data by the level of fluorides in drinking water, the only difference was detected in the occurrence of caries lesions.

Conclusions: The difference in caries indices in mixed dentition by place of residence in Estonia was smaller than expected. Variation calculated by the fluoride level of drinking water reflected statistically only in the number of caries lesions. Reasons of the non-expected difference required further researches.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

PD010
Prosthetic Rehabilitation of a Maxillo-Mandibular Gunshot Defect: Clinical Report
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Aim: The use of dental implant is a predictable treatment option for both partially and complete edentulism, as well as maxillofacial defects. Defects either congenital or acquired by trauma or tumor resection can result in significant aesthetic deformities and functional disorders which may result in psychological sequelae. The incapacitating nature of the defect makes reconstruction of maxilla and mandible challenging. Extensive soft and hard tissue loss usually requires an implant-supported or retained prostheses to obtain adequate facial support and restoration of oral functions. The purpose of this case report is to present prosthetic rehabilitation of a patient with mandibular and maxillary gunshot defect.

Case: The patient was rehabilitated using implant supported fixed partial dentures, tooth supported fixed partial dentures and removable partial dentures. Despite limited mouth opening and anatomical deficiencies, the patient’s aesthetic and functional demands were fulfilled.

Theme: Preventive Dentistry: Caries

PD011
Caries Assessment in Young Children Using WHO and ICDAS-II Criteria
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Aim: To compare the results of caries assessment by ICDAS-II and WHO criteria in young children.

Methods: The study was approved by Volgograd Regional Ethic Committee. Cross-sectional investigation was conducted in Volgograd Pediatric Clinic No 15 in 2010. 96 well-child visitors were enrolled: 288 aged 4–11 months (G1), 220 aged 12–23 months (G2), 88 aged 24–35 months (G3), mean age 9.4 months, 15.5 months and 27.6 months respectively. Informed mothers’ consents were obtained. The caries status was assessed by WHO and ICDAS-II criteria. Statistical analysis was performed by STATISTICA-6, caries prevalence, indexes mean score and 95% confidence interval (CI) were calculated.

Results: According to WHO-criteria caries free were 100% children in G1, 96.4% in G2, and 75.0% in G3, dmfs index was 0.21 (CI 0.02–0.44) and 1.59 (CI 0.99–2.19) in G2 and G3 respectively. According to ICDAS-II criteria caries free were 97.2% children in G1, 94.1% in G2 and 70.5% in G3; ICDAS-II score 1–2 was revealed in 2.8% (CI 1.83–3.77) children in G1, 4.6% (CI 3.19–6.01) in G2, 22.8% (CI 18.33–27.27) in G3, score 3–6 was only revealed in 1.3% (CI 0.34–2.06) children in G2 and 6.7% (CI 4.04–9.37) in G3. Number of children needed treatment was 2.9% to 4.5% higher according to ICDAS-II criteria compared with WHO criteria.

Conclusions: The caries status assessment by ICDAS-II criteria revealed more carious lesions in young children than assessment by WHO criteria; the assessment caries on noncavitated level by WHO criteria in young children.

Theme: Preventive Dentistry: Caries

PD012
Effect of Prophylactic Applications on Enamel Demineralization During Orthodontic Treatment
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Aim: To investigate the caries inhibitory effect of fluoride containing varnish (F), fluorid/tricalciumphosphate containing varnish (FTCP), chlorhexidine containing varnish (CHX) on enamel surfaces subjected to fixed orthodontic appliances when assessed by laser fluorescence (LF).

Material-method: 408 teeth in 17 patients (aged 14–22) wearing fixed orthodontic appliances were included in the study. Split-mouth design was used for each patient (1 quadrant/each application); Group 1: Fluoride varnish (Fluor Protector); Group 2: FTCP varnish (Clinpro TCP Varnish), Group 3: CHX; (Cervitec Plus), Group 4: no treatment (control). Each applications were performed at every 3 months during the orthodontic treatment. All patients were instructed to use a standard-fluoride containing toothpaste (1450 ppm NaF) and informed about their basic oral hygiene routines. Bracket-bonded buccal enamel surfaces were measured at the four surrounding side by laser fluorescence device; DIAGNOdent (Kavo) by two calibrated examiners at the baseline, 3.6–12 months and after 24 months. The mean reading was calculated for each tooth and the LF changes between the time intervals were evaluated. LF changes between the groups were analyzed by Friedman Variance Analysis Test while Kruskal Wallis test revealed the changes due to time intervals.

Results: LF readings increased with time in all groups especially in treatment duration (p < 0.001). Both F and FTCP group showed less LF difference in treatment duration (p ≥ 0.05) except when compared between baseline and 24-months (p < 0.001). The findings of this in vivo study indicated that fluoride containing varnishes are recommended during the fixed orthodontic treatments to inhibit the enamel demineralization assessed by LF.

Theme: Preventive Dentistry: Public Health

PD014
Evaluation of an Oral Health Improvement Programme in a Prison Setting

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Aim: To evaluate the effectiveness of a three-year oral health improvement programme which was designed using a whole settings approach to improve the oral health of prisoners, their families and prison staff in a local prison in Lanarkshire, Scotland.

Methods: A controlled questionnaire-based survey was used to measure the oral health knowledge, attitudes and behaviours of two groups of prisoners, including intervention and control groups. Focus groups were carried out among selected prisoners and prison staff. Interviews were also conducted among prison and stakeholders to investigate the process, challenges and sustainability.

Results: A total of 107 prisoner questionnaires were completed. The intervention group consisted of 58 prisoners while the control group had 49 prisoners. The intervention group showed statistically significant differences in oral health knowledge and attitudes compared with the control group. However, there was no statistically significant difference in oral health behaviours between these two groups. A convenience sample of 14 prisoners and 20 staff participated in focus groups. Qualitative data suggested improvement in the oral health knowledge and behaviours of the prisoners, but little change in environment, culture and policy for the whole prison. Other initiatives such as father-child activities were assessed as having worked well. Eight stakeholders were interviewed and completed the Nuffield Partnership Assessment Tool. Scores indicated that partners were working well together.

Conclusions: The three-year oral health improvement programme was successful in improving oral health knowledge and attitudes of prisoners, but change in behaviours was only indicated in qualitative data.
Theme: Preventive Dentistry: Orthodontics

PD015
Comparison of Arch width Dimensions Among class I and class II div 1 Malocclusion Groups
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Objective: The aim of this study is to 1) compare the arch width dimensions in adults with normal occlusion to those with Class II Division 1 malocclusion. 2) Compare and calculate the maxillary and mandibular arch width difference in both groups.

Methodology: A cross-sectional study conducted at Alvi Dental Hospital & Fatima Jinnah Dental College. A total of 100 Class I subjects (43 males, 57 females) and 85 Class II division 1 (43 males, 42 females) patients, from 13–24 years were selected having all permanent teeth erupted from 1st molar to 1st molar. There was no history of previous orthodontic treatment. Patients with syndromes or grossly carious teeth and posterior crossbites were excluded.

Results: Mean maxillary intermolar, intercanine & interalveolar width for Class I group was 51.6 mm, 34.2 mm, 59.5 mm and for Class II division 1 it was 49.2 mm, 32.5 mm and 57.2 mm, respectively. Mean mandibular intermolar, intercanine & interalveolar width for Class I group was 50.4 mm, 26.4 mm and 55.8 mm and for Class II division 1 it was 50.3 mm, 26.3 mm and 55.4 mm, respectively. Mean intermolar width difference was 1.2 mm for Class I and –1.0 for Class II group.

Conclusions: Maxillary dental arch is narrower in Pakistani adults with Class II Division 1 malocclusion, as intermolar, intercanine and interalveolar dimensions were significantly smaller than Class I sample. Males of both the groups had larger arch width dimensions than the females. Arch width difference was negative for Class II group indicating posterior crossbite tendency.

POSTERS SESSION 03 (P419–P627)

Theme: Dental Treatment & Restorative Dentistry: Caries

P419
Prevalence of Talon Cusp in a Turkish Sub-population
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Purpose: The aim of this study was to investigate the prevalence of talon cusps on permanent teeth in a Turkish population and their distribution among different type of teeth.

Materials and methods: Clinical and radiographical examination of 8388 Turkish subjects (4731 female, 3657 male) were conducted to determine the talon cusp on permanent teeth. All cases were evaluated in accordance to the classification by Hattab et al. The records and radiographs of the patients with talon cusps were evaluated in terms of age, gender, location, affected tooth, talon type and treatment procedure. Statistical analysis was performed by using Chi-square test (p < 0.05).

Results: Thirty-one patients presented talon cusps with a total number of 59 teeth. 22 talon cusps were classified as trace-talon (37.29%), 30 were semi-talon (50.85%) and the remaining 7 were true-talon (11.86%).

Conclusion: The prevalence of talon teeth were found to be 0.36% on permanent teeth in a sub-population of Turkish adults.

P420
Influence of Cavity Design on Cuspal Deflection in Maxillary Premolar
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Aim: To investigate the influence of cavity design on cuspal deflection in maxillary premolar using finite element analysis.

Materials and methods: Three-dimensional models of maxillary premolar with three cavity preparation designs: mesio-occlusal-distal cavity, mesio-occlusal-distal cavity with 2.0 mm palatal cusp reduction and mesio-occlusal-distal cavity with 2.0 mm buccal and palatal cusp reduction were generated using SolidWorks 2011 software. All cavities were simulated to be restored with direct resin composite restoration. Static axial load with the resulting force of 200 N was applied on the occlusal surface of a tooth at the palatal cusp tip and both marginal ridges, simulating maxillary premolar in the maximum intercuspal position. The same software was used for finite element analysis. Cuspal deflection values were calculated and recorded for the models.

Results: Performed numerical simulations showed no differences in cuspal deflection among tested models.

Conclusions: This study showed no influence of cavity preparation design on cuspal deflection, suggesting that in maxillary premolar with mesio-occlusal-distal cavity cuspal reduction has no advantage.

Theme: Dental Treatment & Restorative Dentistry: Endodontics

P421
Comparison of Various Smear Layer Removal Techniques on push-out Bond Strength of MTA Fillapex
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Introduction: The purpose of this study was to compare the smear layer removal efficacy of EDTA, chitosan, Er, Cr: YSGG laser or...
ultrasonic irrigation regimes on push-out bond strength of MTA fillapex.

**Methodology:** Twenty extracted single-rooted human teeth were randomly divided into four groups (n = 5). During preparation, after each file size root canals were irrigated with 1% NaOCl. Final irrigation regimes were used respectively; Group 1, 3 ml 17% EDTA for 3 min; Group 2, 3 ml 2% Chitosan for 3 min; Group 3, saline for 1 min with ultrasonics; Group 4, saline for 1 min with Er, Cr: YSGG laser (Biolase Technology, Inc, San Clement, CA). Then the canal spaces were filled with MTA fillapex (Angelus, VDW) using single cone technique. After incubation for one week, roots were sectioned into 1 mm thickness and dislodgement resistance of the samples were measured using a universal testing machine at a crosshead speed of 0.5 mm/min. Data were analyzed using Kruskall-Wallis test (p = 0.05). 

**Results:** There was a significant difference between the groups (p < 0.0001). The middle and coronal thirds of the root canals in MTAD group showed lower average scores than those in groups EDTA/ Er:YAG laser. In the apical, middle and coronal thirds of the root canal there was no significant difference between the EDTA and Er:YAG laser groups.

**Conclusions:** MTAD removes most of the smear layer when used as an intracanal irrigant.

**P423**

**Effect of MTAD and Er:YAG Laser on Smear Layer Removal: An SEM Evaluation**

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**Introduction and Aim:** Various organic acids, instruments and lasers have been used to remove the smear layer from the surface of instrumented root canals. The aim of this study was to determine the effectiveness of MTAD (a mixture of a tetracycline isomer, an acid, and a detergent) and Er:YAG laser to remove the smear layer, and compared with that of 17% EDTA and 5.25% NaOCl.

**Materials and methods:** Twenty-eight extracted maxillary and mandibular incisors were prepared with ProTaper Universal rotary files. Following each file use, the root canals were irrigated with 5.25% NaOCl. The teeth were randomly allocated to four treatment groups; (1)17% EDTA (control group), (2) 5.25% NaOCl, (3) Er:YAG laser and (4) MTAD. All teeth were processed for scanning electron microscopy (SEM) and the removal of the smear layer was examined in the apical, middle and coronal thirds. Analyses of SEM images were performed using a four grade scale.

**Results:** There was a significant difference between the groups (p = 0.0001). The middle and coronal thirds of the root canals in MTAD group showed lower average scores than those in groups EDTA/ Er:YAG laser. In the apical, middle and coronal thirds of the root canal there was no significant difference between the EDTA and Er:YAG laser groups.

**Conclusions:** MTAD removes most of the smear layer when used as an intracanal irrigant.

**P424**

**Comparison of Four Electronic Apex Locators to Determine The Major Foramen**

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**Aim:** To evaluate in vitro the accuracy of four electronic apex locators, Dentaport ZX, Raypex 5, Endomaster and VDW.Gold in detecting the major foramen using the clearing technique.

**Methodology:** Forty-eight extracted human single-rooted teeth with mature apices were used for the study and divided into four groups of 12 teeth. All teeth were embedded in an alginate model. The electronic measurements were taken following the manufacturers’ orientations using a #15 K-file attached to the holder. Then the teeth were cleared and photographed under a stereomicroscope with a digital camera. The distance between the tip of the file and the major foramen was measured by using image analysis software programme. Positive and negative values were recorded when the file tip was beyond or short of the major foramen and zero value when the file tip and the major foramen coincided. Statistical
analysis were performed using the Kruskal-wallis and chi-squared test at a significance level of 0.05.

Results: The mean distance between the file tip and the major foramen were 0.302, 0.063, 0.117, 0.258 mm in the Dentaport ZX, Raypex 5, Endomaster and VDW.Gold groups, respectively, with no statistically significant differences (p > 0.05).

Conclusion: Under the in vitro conditions of this study, all electronic apex locators showed an acceptable determination of the major foramen.

P425

The Quality of Different Preparation and Root Canal Filling Techniques in Curved Root Canals

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Aim: The aim of this study was to evaluate the quality of different root canal filling techniques such as lateral compaction and thermoplasticized injectable gutta percha in curved root canals which were prepared Revo-S (Micro-Mega, Besançon, France) or self-adjusting file (SAF; ReDent-Nova, Ra’anana, Israel) using digital radiographs.

Material-methods: Curved root canals of 40 extracted mandibular molar teeth were prepared using SAF or Revo-S instruments. After determination of root canal curvatures and radii in two directions, the canals were divided into two subgroups (n = 20, p > 0.05). Both mesiobuccal and mesiolingual canals were shaped and filled with AH Plus and either cold lateral compaction technique or high-temperature thermoplasticized injectable gutta percha obturation technique. The specimens were stored for 1 week at 37°C and 100% humidity to allow the complete setting of the sealer. Postoperative digital radiographs were taken to evaluate the quality of root canal fillings using a modified scoring system originally suggested by Kersten et al (1). Data were analyzed using Mann-Whitney tests.

Results: All groups exhibited similar root curvature (p > 0.05). In terms of the preparation techniques, no significant differences were found between the root canal filling techniques (p = 0.127).

Conclusions: Under the conditions of the present study, neither preparation nor obturation techniques did not affect the quality of root canal filling in curved root canals.


P426

Comparing Time Spending between when Maseren kit, Ultrasonic and CFS using for Retrieving Broken File

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Introduction: There have been many different devices developed to retrieve fractured instruments during endodontic procedures. The file removal process becomes even more difficult when breakage occurs in the apical third of the canal. When an attempt to bypass such a fragment becomes difficult, it should be retrieved by mechanical devices. Variations in success rates have been reported according to devices used for removal of separated instruments. The purpose of this study is to compare the duration of use of the devices which were successful in retrieving of the separated endodontic file from the root canal.

Methods: In this study 60 mandibular first premolar teeth were used. Rotary notched instruments were run at different pressures with a high-torque handpiece to break the instruments and impact them to apical 1/3 level of the canal walls. Attempts were made to visualize all fractured instruments under a dental loop after creating a straight-line access to the fragment. Broken instruments were removed with ultrasonic, Maseren Kit and Canal Finder System and successful time spending results were recorded.

Results: In the Ultrasonic group, the overall success time was 211 s in the Maseren Kit’s it was 91 s in the Canal Finder system’s it was 252 s and in the Bypass’s it was 287 s Success time were significantly higher when attempt to bypass fractured file.

Conclusions: Maseren Kit used in this study for fractured instruments were effective, and three times greater success time was obtained. Bypassing fractured fragment in the apical 1/3 is more difficult and time spent than other methods.

P427

Fatigue and Fracture Resistance of Devitalized Teeth: Finite Element Analysis

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Aim: This study represents a part of major project investigating the phenomenon of increased fragility of devitalized teeth. The Finite-Element-Method is used to analyze fracture resistance and fatigue behavior of dental tissues in various phases of root-canal-treatment.

Materials and methods: Two intact upper premolars of the same patient with very similar external and root canal morphology were used. One tooth remained intact while the other underwent root canal enlargement up to the size of 0.40 mm at the physiological apex, with 0.1 mm increment every 1 mm coronally. It was restored with mesio-occlusal Class II composite filling. Both teeth were scanned and used to create 4 FEA models: intact tooth, tooth with mesio-occlusal Class II composite restorations and two models with root-canal-treatment representing initial and final enlargement of the canal. Critical breaking axial force was determined by compression test. Material characteristics were taken from the literature. Mechanical performance of dental tissues were analyzed using Finite-Element-Method.
Results: Comparing with intact tooth, premolar with Class II restoration had reduced strength for about 20% and could survive 11% less cycles during cyclic load. Devitalized tooth with initial root canal enlargement showed greater reduction of strength (28%) and number of survived cycles was decreased for 33% in fatigue testing. The canal spreading up to final enlargement had small additional influence on tooth resistance both on critical force and on cycling load.

Conclusion: Our results elucidate the influence of changes in tooth geometry during root-canal-treatment and crown restoration on increased fragility of devitalized teeth.

Case Reports

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Aim: To describe a conservative approach in the treatment of horizontal root-fractions and their one-year follow up.

Case: Management of root fractures depend on the extent of the fracture line, the pulp situation, occlusion, dislocation of fragments and the general health of the patient.

Case 1: A 33 year-old male patient was referred to our clinic with the complaint of root fracture two months after a traffic accident. Diagnosis of root fracture on maxillary central incisor was accomplished by clinical and radiographic examination. Pain was observed in horizontal and vertical percussion tests, and also mobility was observed. Coronal part of root fracture did not respond to electrical pulp testing. Radiographic examination revealed healing with interpolation of soft tissue and presence of radiolucency. The treatment plan comprised of splinting the coronal fragments and using calcium hydroxide as an intracanal medicament. Then 1 week later, root canal therapy was performed to coronal part of the root.

Case 2: A 30 years-old female was referred to our clinic as a result of fracture of maxillary right central incisor, occurred 2 days ago. At radiographic examination horizontal root fracture was determined. Pain to palpation, percussion of teeth, normal mobility and positive response of pulp testing was determined in clinical examination. Endodontic therapy was performed and calcium hydroxide was applied at first visit. 1 week later, root canal obturation of both coronal and apical parts was completed.

Results: At one-year follow up, the teeth were asymptomatic, and clinical and radiographic examinations revealed healing patterns.

Objectives: To evaluate the adhesion of a resin-based sealer to human dentine irradiated with Nd:YAG laser at two different frequency parameters, using the push-out test.

Study design: Forty eight maxillary anterior teeth were instrumented using crown-down technique. After each instrument, the root canals were irrigated with 5 ml 2.5% NaOCl. Specimens were divided into four groups (n:12): Group C (control group), No was performed to the specimens. Group 1, dentine was treated with 2 ml of 17% EDTA for 5 min. Group 2 and 3, dentine were irradiated with Nd:YAG laser at 10 Hz and 15 Hz, respectively. The root canals were then filled with Epiphany SE-Resilon. The roots were sectioned 4 mm below the cemento-enamel junction to provide 4 mm thick dentine discs which were centered inside aluminum discs and embedded in acrylic resin and submitted to a push-out test.

Results: Statistically significant differences were found among the groups. Group 3 showed significantly higher bond strength than the other groups (p < 0.05). Group 2 showed the lowest adhesion values (p < 0.05).

Conclusion: An increase in laser frequency increased the adhesion of the Epiphany sealer to dentine walls.
**Conclusion:** It is possible to achieve dental pulp regeneration from blood clot inside the root canal by LPT stimulation. This could probably be outcome of periapical stem cell homing.

**P431**

**Effect of Tooth Localization on Dimensional Changes of Pulp Chamber in Renal Patients**

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**Objective:** The aim of this study was to evaluate the effect of maxillary or mandibular localization of the teeth on dimensional changes of pulp chambers in hemodialysis and transplanted patients.

**Materials and methods:** Forty-four patients (aged 20–50 years) with chronic renal disease over one year were examined due to their maxillary or mandibular localization and dimensional measurements of the pulp chambers were performed. Full-mouth periapical radiographs of all of the patients where taken and images were adapted to a software programme where outer lines of images of the teeth were determined and drawn digitally. The inner areas and the outer lines of pulp chambers were measured automatically. Ratios of the pulp areas to tooth areas were calculated for each tooth and the findings were evaluated statistically by ANOVA test.

**Results:** Comparison of dimensional changes of the pulp chambers of renal patients with those of healthy individuals on both the maxillary and mandibular tooth localizations showed that, pulp chambers of renal patients were significantly smaller than those of the controls (p < 0.001). The difference of the tooth localization on upper or lower jaws, has also a significant effect on dimensional changes of the pulp chambers.

**Conclusion:** Considering the effect of maxillary or mandibular localization of the teeth on dimensional changes of the pulp chambers in hemodialysis and transplanted patients, it was shown that tooth localization on different jaws could be effective for the amount of abnormal mineralization in pulp chambers.

**P432**

**The Influence of 17%EDTA and 10%citric Acid on Root Canal Dentin in Combination with 2.5% Sodium Hypochlorite**

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**Aim:** The objective of the present study was to evaluate the capacity of chelators 17%EDTA and 10% citric acid used in root canal alone or combined with 2.5% sodium hypochlorite to remove calcium ions from root canal dentin and quantify the extracted calcium ions released during root canal therapy by atomic spectrophotometry absorbance.

**Material-methods:** Total 40 pieces of dentin were analyzed. Dentin samples were immersed in reagents (about 2–3 ml) and left in for 15 min. After the expiration of the time they, were washed out and put on chemical watch glasses to dry at room temperature for 2–3 h. Then teeth were crushed to fine powder in mortar with pestle. Crushed tooth samples scales 0, 05 g (to the nearest 0, 0001 g) in glass vials to which is added 1 ml HNO3, 1 ml H2O2 and 1 ml HCl. Then the glasses are placed on the hot plate and heat until crashed teeth get dissolved. Solutions obtained by the thermal decomposition of the teeth quantitatively transmitted measures in small bottles of 50 ml. Measured samples complement destilized water to marked.

**Results:** In the study results shows the effect of chelating solutions on a Calcium ration in root dentine with statistically significant changes (p < 0.05) in short term application of combined irritant solutions of 17%EDTA and 10% citric acid with with 2.5% sodium hypochlorite.

**Conclusion:** The conclusion is based on findings that 2, 5% sodium hypochlorite removes the organic parts of the smear layer leaving the dentin substrate to the action of the chelators as preferred combination.

**P433**

**A Conservative Approach for Complicated Crown-Root Fracture: A Case Report**

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**Introduction:** Dental traumatic injuries are highly prevalent among children and adolescents. Crown-root fractures of anterior teeth present difficulties for restoration. This case report describes the treatment of a complicated crown-root fracture of maxillary right lateral incisor with extensive loss of tooth structure and uncomplicated crown fracture of maxillary right central incisor in a young adult.

**Case:** The 15-year-old male patient was presented to Endodontic clinic with post-traumatic injury. After the mobile crown-root fragment of lateral incisor was removed, root canal therapy was performed in two visits. Calcium hydroxide was used as an intracanal dressing. Root canal filling, glass fiber post cementation and adhesive tooth fragment retatchment were performed. Central incisor was restored with composite restoration. Early stage success was achieved with the observance of good functional and aesthetic outcomes. However the patient did not attend follow-up visits and returned after 14 months with secondary trauma which resulted fracture of the reattached part and minor fractures extending to middle root so the tooth was extracted.

**Conclusion:** As it is crucial to retain the tooth to maintain space and to protect alveolar bone height, clinicians should always consider trying retatchment of tooth fragments. The case presented here is sufficient and effective in postponing fixed prosthetic restorations or implant treatments.
Is it Possible to Reduce File Numbers of the Conventional Rotary Systems?

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Aim: To evaluate whether it is possible reduce file numbers of the conventional rotary systems and to compare with Reciproc.

Methods: A total of 45 simulated canals with 40° curvature in clear resin blocks were prepared with conventional rotary systems; ProFile orifice shaping #3 and final flaring #25/.06 (Dentsply Tulsa Dental, Tulsa, OK), Reciproc R25 (VDW, Munich, Germany), and ProTaper shaping file SX and finishing file F2 (Dentsply Maillefer, Ballaigues, Switzerland). Instruments were used one time before being replaced. Pre- and post-instrumentation views were analyzed using digital images captured by a camera. Prepared inner and outer walls at 1–10 levels was measured by using a software program. The transportation, instrumentation time, change of working length, and instrumentation fractures were evaluated. Data were analyzed by ANOVA, Kruskal Wallis and Independent T Test (p < 0.05).

Results: Reciproc removed more mass in total and caused less transportation in middle and coronal third (p < 0.05). The transportation performed in the apical third, opposite to the curve. There was no significant difference among the groups in terms of maintaining the original working length. Reciproc was significantly faster (p < 0.05). Only one instrument fracture (25/0.06 ProFile) was noted. All groups showed one each ledge.

Conclusion: Within the limitations of this study, ProFile and ProTaper files have a potential for reducing the file numbers in shaping for curved root canals. However, Reciproc produced with the concept of a single file, was determined that more advantageous in terms of time and shaping ability.

Can An Avulsed Tooth Survive Without A dentist? – a case report

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Aim: To present an avulsed permanent maxillary central incisor, which was replanted randomly 12 years ago without any professional treatment.

Case: A healthy 22-year-old male referred to the Department of Endodontics, related to ache of the tooth 11 in February 2010. In his dental history, it is informed that, he fell to the ground in the schoolyard before 12 years and the right central incisor was avulsed.

The avulsed tooth was replanted immediately by the school janitor but he did not referred to any dentist until 2010. He mentioned now and then abscess formation in frontal apical area of the related tooth.

The clinical examination revealed the presence of color change, and sensitivity to percussion, but the absence of vitality, mobility or ankylosis. Radiographic examination showed the presence of inflammatory external root resorption and an extensive apical lesion. A nonsurgical root canal treatment was performed in two visits. Then, intracoronal bleaching was performed.

Three years after treatment, recall examination revealed a normal periodontal tissue with absence of infection, mobility, ankylosis, progressive resorption or apical lesion. The tooth color had no relapse in this period.

The Effect of Acidic Environment on MTA and Bioaggregate

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Introduction: The aim of this study was to compare the effect of acidic environment on the dislodgement resistance of mineral trioxide aggregate (MTA) and Bioaggregate (BA) (Innovative BioCeramix, Vancouver, Canada)

Methods: Eighty freshly extracted human maxillary central were used in this study. Teeth were sectioned transversally 4 mm below
the cemento-enamel junction to provide 4-mm-thick dentine discs that were embedded in acrylic resin. Next, the specimens were randomly assigned to two experimental groups according to the type of the root canal repair materials (n = 40). Specimens of each material were randomly divided into 4 groups (n = 10) according to storage media: group A: butyric acid (pH = 4.4), group B: butyric acid (pH = 5.4), group C: butyric acid (pH = 6.4), group D: phosphate-buffered saline (PBS) (pH = 7.4). Dislodgment resistance was then measured using a universal testing machine.

Results: MTA and BA had the same dislodgement resistance. The dislodgment resistance of MTA and BA was significantly reduced (p < 0.05) after exposure to acidic environment. After rise of acidic pH, there was a statistically significant difference among groups; the MTA D group had significantly the highest bond strength, and the MTA group A had the lowest (p < 0.05).

Conclusions: MTA and BA is influenced by the acidic environment.

P438
Efficacy of Ibuprofen and Celecoxib in Controlling Post-Endodontic Pain
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Introduction: The occurrence of postoperative pain is not a rare event even when root canal treatment has followed acceptable standards. Post-operative pain is almost exclusively due to the development of acute inflammation at the peri-radicular tissues in response to an increase in the intensity of injury coming from the root canal system. NSAIDs have been shown to be very effective for managing pain of inflammatory origin. For controlling post-endodontic pain COX-2 selective inhibitors can be prescribed as they provide analgesia and anti-inflammatory activity while avoiding adverse effects on gastrointestinal tract and other tissues related to non-selective NSAIDs.

Objective: To compare the efficacy of ibuprofen and celecoxib in controlling post-endodontic pain.

Study design: Quasi Experimental study.

Settings: Department of Operative Dentistry, FJDC

Duration: 22nd December 2006 to 29th April, 2008 (1 year 4 months)

Subject and methods: One hundred patients requiring root canal treatment and meeting the criteria of the study were equally divided into two groups, A and B. Pulpectomy was done and canals prepared till ISO #25 file reached the estimated working length. Patients in group A were administered Ibuprofen and those in group B were given Celecoxib. First dose was given preoperatively. Each patient rated their pain on a visual analog scale at initial and then 4, 8, 12, 24 and 48 h after initiation of endodontic therapy.

Results: There was no statistically significant difference in post-endodontic pain between the groups of patients taking Ibuprofen and Celecoxib.

Conclusions: Ibuprofen and Celecoxib have similar efficacy in controlling post-endodontic pain.
Aim: The aim of this study was to evaluate the types of defects observed on new rotary NiTi instruments using scanning electron microscopy (SEM).

Materials and methods: The study was conducted using new sets of rotary NiTi instruments of four different brands of different manufacturing methods. The instruments included were ProTaper (Dentsply Maillefer, Ballaigues, Switzerland), Mtwo (VDW, Munich, Germany), RaCe (FKG Dentaire, La Chaux-de-Fonds, Switzerland) and Twisted Files (TF) (SybronEndo, Orange CA, USA). Eleven instruments of each commercial brand were used (total = 44). The instruments were carefully removed from their original packages and analyzed with SEM (JSM 6400; JEOL, Tokyo, Japan) for the presence of defects such as irregular edge, debris, grooves, microwravities/pitting and scraping. Final 3 mm of the instruments were examined at wide range of magnifications and no type of treatment or preparation was performed. The SEM micrographs were analyzed by 2 skillful observers.

Results: All files showed defects and no instrument was free of imperfections. Major defect was presence of grooves and 100% of Mtwo and ProTaper instruments presented scratches and grooves. While RaCe instruments presented surface debris in 100% of the samples, surface debris was observed in 72.7% of ProTaper and 45.4% of Mtwo instruments. TF had the least surface debris on the instruments (18.2%). While 63.6% of Mtwo and 54.5% of ProTaper and RaCe instruments presented scraping, TF presented scraping only in 27.3% of the samples.

Conclusion: All instruments showed some imperfections. TF instruments presented less manufacturing defects than the instruments manufactured by traditional methods.

Aim: To describe the non-surgical treatment of a lateral perforation in the cervical third of the root of a maxillary left incisor using mineral trioxide aggregate (MTA).

Case: 21-year-old female patient was referred our clinic due to cervical root perforation in her maxillary left incisor that occurred during erroneous endodontic access cavity preparation by a undergraduate student. Clinic examination showed the tooth was not tender to percussion and palpation. Radiographic examination showed a wide periapical lesion surrounding the apex and also lateral perforation site. Following isolation with rubber dam, proper access cavity was prepared and root canal was explored with aid of ultrasonic instruments. Apical patency was obtained with #08 C+ file then working length was determined by periapical radiographs. The root canal was prepared up to size #40 K file under copious irrigation with 2% chlorhexidine then dressed with calcium hydroxide. One week later calcium hydroxide was removed and final irrigation was achieved with 2% chlorhexidine. The root canal was obturated with AH Plus and Thermafil technique to the perforation level. Perforation site was restored with MTA and sterile moist cotton pellet was placed onto MTA for setting. One day later setting of MTA was controlled and the tooth was restored with light cure composite resin. 3rd month follow-up revealed the tooth was asymptomatic and patient had no complaints.

Result: MTA provides an effective seal of root perforations and improves the prognosis of iatrogenic perforated teeth that would otherwise be compromised.

Aim: To present the diagnosis and root canal treatment of mandibular canine showing anatomical variation with two root canals.

Case: 30-year-old female patient was referred to our clinic for root canal treatment of mandibular canine due to symptomatic pulpitis. Clinical examination revealed the pulp was vital, the tooth was not tender to percussion and palpation. Radiographic examination revealed profound dentin caries associated with pulp chamber. Following administration of local anesthesia, the tooth was isolated with rubber dam, the caries was removed and endodontic access cavity was prepared. During examination of pulp chamber floor under magnification via loupe (×4) an extra orifice was explored. Working lengths were determined by electronic apex locators. Biomechanical preparation was achieved with ProTaper Rotary System up to F5 size under copious irrigation with 5.25% NaOCl. 17% EDTA and 5.25% NaOCl were used for final irrigation. The canals were dried with sterile paper points and obturated by cold lateral compaction technique with AH Plus and gutta percha. The tooth was restored with light-cured composite resin.

Result: Detection of anatomic variations is essential for successful treatment. Clinicians should consider the possible variations and always search for second root canal in mandibular canines. Magnification with dental loupes and operating microscope enhance the possibility to detect anatomical variations.
P444
Effects of Rotary Instruments on Treatment of Young Permanent Tooth
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Introduction: Large periapical abscess may easily be caused by caries on young permanent tooth if it is not treated at the beginning. The large abscess is treated by either root canal treatment or extraction of tooth.

Case: 12 year old girl patient appealed to the clinic with pain and swelling on lower left second molar tooth. Clinical examination showed extensive carious lesion accompanied with pain on percussion. Pulp testing gave negative result and an extensive radiolucency surrounding both mesial and distal roots were observed in radiographic examination. Root canal preparation was performed with ProTaper rotary system using endomotor (EndoMaster /EMS). Straight line access was achieved with ProTaper Sx file and apical enlargement was concluded with ProTaper F2 file. Canals were irrigated with 2.5% NaOCl. Large periapical lesions can resolve by nonsurgical endodontic therapy employing calcium hydroxide intracanal interappointment medicament. At this case we used calcium hydroxide paste for endodontic therapy for 15 days.

After 15 days, pain on percussion was not present and size of lesion observed to begin decreasing radiographically. Obturation was performed with lateral condensation technique, master cone (ISO 30) and AH Plus. Patient was followed at first, third and sixth month radiographically. The size of the lesion was decreased markedly. After the root canal obturation the crown of the tooth restored with using split crown (An-Ger G&A polyester crown forms and P250 composite)

Conclusion: Using rotary instrument is not a usual way for treatment of young permanent teeth. The fast success of treatment using rotary instrument may result on young permanent tooth.

P445
In vitro Evaluation of Impact of Rinsendo Irrigation System on Apical Extrusion
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Aim: In this study, the aim was to evaluate the apical irrigant extrusion of Rinsendo, a hydrodynamic activation system, at different needle penetration depths.

Material-method: We used 45 single rooted human teeth. Teeth were instrumentated to an apical size of 25.06 with Protaper Universal® system. After the preparation root canals were irrigated and dried with paper points. A metal device with an apparatus to place the millimetric sheets parallel to teeth were used to position the teeth to observe the apical irrigant extrusion. Teeth were divided into three groups (n:15 for each group) randomly. In group 1 and 2, teeth were irrigated with methylene blue using Rinsendo, which was placed 5 mm and 7 mm short of working length, respectively. In group 3 (control group) teeth were irrigated with methylene blue by positioning a 27 gauge endodontic needle and syringe 1 mm short of working length. Finally, the distance between the most extruded methylene blue stain and the apex of the tooth which was marked on the millimetric sheet was measured.

Result: Significantly less apical extrusion was observed in group 3 in accordance with group 1 (p = 0.004 < 0.001) and group 2 (p = 0.007 < 0.001). Although there wasn’t any significant difference between group 1 and 2, less apical extrusion was observed in group 1 (p = 0.497 > 0.05).

Conclusions: Using the conventional irrigation tips results in less apical extrusion when compared to Rinsendo. However, the safety of Rinsendo can be increased by lessening the penetration depth of the needle.

P446
Post Operative Evaluation of Peri-Radicular Healing after Endodontic Surgery
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1Rajat Pratap Singh, 2Surendra Kumar Mishra

Introduction: The purpose of this paper is to evaluate the healing of peri-apical lesions in a group of patients whose teeth were managed with periapical surgery. Periapical surgery should be considered as an extension of non surgical treatment because the underlying etiology of the disease process and the objectives of treatment are same i.e. prevention or elimination of apical periodontitis including the removal of pathological tissue and microorganisms.

Conclusion: The success of periapical surgery depends on proper root canal preparation, Apicectomy & obturation rather than the method of filling whether it is orthograde or retrograde.

P447
The Effect of Office Bleaching Application on the Color and Translucency of Five Resin Composites
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Objectives: The aim of this study was to investigate the effect of office bleaching agents on the color and translucency of different resin composites.

Methods: Twenty-four disk-shaped specimens (1 mm thickness, 8 mm diameter) were fabricated from each resin composite (Gradian Direct, Filtek Ultimate, Majesty Esthetic, Valux Plus and Ceram-X) and divided into three subgroups – two different bleaching kits (Hydrogen Peroxide (HP) 38% Opalescence Boost (OB), HP 38% Whitesmile Power Whitening (WP) and a control group (n = 8). Baseline CIE L*a*b* color coordinates were measured...
using spectrophotometry and translucency parameters (TP) were calculated. Experimental groups were treated with bleaching agents according to manufacturers’ instructions. The control group was stored in distilled water (DW) for 14 days. Color and translucency measurements were repeated after bleaching procedures, and color differences were calculated. ΔE values >3.3 were considered clinically unacceptable. Data were analyzed using ANOVA and the paired sample t-test (α = 0.05).

Results: Clinically unacceptable color change was detected for Majesty Esthetic/OB, Ceram-X/OB, Ceram-X/WP groups (ΔE > 3.3). There was a significant color difference between the control and bleached specimens using different kits (p < 0.05). The Ceram-X/OB group (4.13 ± 0.58) exhibited the greatest color change. The highest baseline TP value was in the Ceram-X group (12.47 ± 1.38) (p < 0.05). TP values in each group between baseline and the end of the 14th day revealed no statistical significant translucency difference (p > 0.05).

Conclusions: Application of two office bleaching kits resulted in translucency difference (p < 0.05).

ΔE values in each group betweenbaseline-
cam medicaments. The control group 

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P449

Novel Esthetic Treatment of Bilateral Gemination of Maxillary Central Incisors

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Introduction: Gemination and fusion are developmental anomalies in size, shape and structure of the dentition. Gemination or twinning refers to the development of two teeth from a single tooth bud. As it usually represents an unsuccessful attempt of a tooth bud to divide, gemination results to a variable degree of separation of roots and crowns. Dental fusion is defined as the union of two or more distinct tooth buds and depending on the time and the specific site of the developmental insult, the phenotype of the condition also varies. Both differential diagnosis and clinical management of the conditions constitute major challenges in Dentistry.

A multidisciplinary approach is required to meet patient’s needs and expectations and balance possibilities and limitations. While treatment modalities include prosthetic rehabilitation with or without endodontic therapy, Orthodontics and autogenous transplantation, the hemisection of the fused tooth seems to be the treatment approach of choice for most clinicians.

Case: We report a case of bilateral gemination of the maxillary central incisors in an orthodontic adolescent patient and present a conservative restorative treatment via porcelain laminated veneers (PLV) that preserves pulp vitality, ensures proper periodontal ligament function and provides excellent esthetics.

P450

Differences in Color of Maxillary Central Incisor Depending on Gender

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Aim: Color and the appearance of teeth are complex phenomena under the influence of combined effects of extrinsic and intrinsic coloring as well as optical properties of teeth such as transmission and reflection of light. The aim of this study was to evaluate differences in color depending on gender.

Materials and methods: This study was conducted on 80 dental students (40 males and 40 females) between 20 and 24 years. The color of maxillary right central incisor was determined with intraoral spectrophotometer. As a result of the measuring, VITAPAN classical and VITA 3D-Master color is shown. L*, a* and b* values were noted down for each result. During the research the
participants filled in the questionnaire regarding dietary habits and cigarette consumption. The obtained results were processed by using χ², t-test and Mann-Whitney test.

**Results:** According to Mann-Whitney test results that were not a statistically significant color differences for women and men teeth. Based on the p value of 0.860573, there was no difference in the lightness of maxillary central incisor between genders, nor in red-green tone. Statistically significant difference exists when the blue and yellow balance is concerned.

**Conclusions:** Considering the limitations of this study, the results show that there is no difference in the color of maxillary central incisor between the genders. Also blue-yellow tone is less visible with female gender students. The consumption of cigarettes, coffee, tea, Coca-Cola, red wine as well as apples and beetroot does not affect teeth color.

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**P451**

**Bleaching of Non-Vital Teeth Stained After Endodontic Treatment: Case Report**

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**Introduction:** In recent years, tooth whitening has become one of the most rapidly growing concern of esthetics dentistry. With the growing awareness of esthetics and conservative treatment options, there is a greater demand for the procedures to solve such unsightly problems like tooth staining. Tooth staining may occur due to extrinsic or intrinsic reasons. One of the major causes of intrinsic staining is endodontic treatment. Reasons such as excessive bleeding after the removal of pulp, kind of the materials used for treatment as well as the inadequate or no cleaning of canal filling or sealing materials from pulp chamber during endodontic treatment can cause tooth staining.

**Case:** The aim of this study was to evaluate the success of bleaching applied with the walking bleaching technique using the agent containing %35 H2O2 (HP whiteness superendo) to the teeth that are stained due to endodontic treatment. Four different patients were treated with bleaching agent containing %35 H2O2. Patient were followed up for 1 year.

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**P452**

**Chairside CAD/CAM Technology: A Report of Two Cases**

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In recent years with the rapid advancement of CAD/CAM systems, it has been able to make the dental restorations with the support of computer in the field of dentistry. By using CAD/CAM systems, working methods were simplified and able to use newer and more high-quality materials. This case report presents restorations being used CAD/CAM systems of two cases showing an upper right first molar tooth with the complaint of thermal sensitivity and a maxillary midline diastema. In the first case, it was observed an old composite filling on the tooth. Old filling was removed. By using CAD/CAM system, a ceramic inlay was made then cemented with a dual-cure resin cement. In the second case, teeth were treated with laminate veneer by using CAD/CAM system. CAD/CAM systems are extremely aesthetic but some CAD/CAM systems require expert user and devices are expensive.

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**P453**

**Single-Visit Bridges Using Bondable Reinforcement Ribbon and Natural Tooth: A Non-Invasive Technique**

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**Introduction:** Loss of anterior teeth causes a major problem with phonation and esthetics. The replacement of anterior teeth lost by periodontal reasons with porcelain fixed prosthesis can mostly not commute the aesthetics of natural teeth. For this reason, adhesive bridges that have been done using patient own teeth are employed to provide the patient’s natural aesthetics. In addition this can be done with a minimally invasive approach. The bondable reinforcement ribbon (Ribbond™) is quite common in adhesive bridges. Ribbond based single-visit bridges provide strength, durability and immediate convenience. Ribbond based bridges are cost effective and reliable.

**Case:** This case report presents the replacement of anterior teeth which are extracted for periodontal reasons for attaining the function and aesthetic again with adhesive bridges in three different cases.

**Theme: Dental Treatment & Restorative Dentistry: Materials**

**P454**

**Element-Release from Orthodontic Brackets in Artificial Saliva with Different Acidity**

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**Objective:** The increasing use of nickel containing devices in orthodontics and the growing prevalence of nickel allergy in the population significantly increases the interest in biocompatibility studies of these devices. The decisive factor determining the biocompatibility of orthodontic brackets is their corrosion behavior. The aim of study was to test the hypothesis that increased acidity would have affected on amounts of element release from new stainless steel brackets.

**Methods:** We assayed the corrosion resistance, in terms of ion release, stainless steel orthodontic brackets in artificial saliva with various acidities. Orthodontic brackets (n = 10) were exposed to artificial saliva (37°C) at pH 2.4 and 7 for different periods (1–15 days). The daily amount of Ni and Cr ions released from brackets was determined using an atomic absorption spectrophotometer and an in-vitro day-to-day ion release pattern has been obtained for 15 days. The release amount of individual Ni and Cr...
ions was statistically analyzed by multifactorial ANOVA for analyzing factors, including the pH, and immersion period. Tukey’s test was chosen as the following multiple-comparison technique when necessary.

Results: Results showed that pH value, and immersion period, respectively, had a significantly statistical influence on the release amount of Ni and Cr ions. The higher acidity resulted in higher amounts of ions released for all periods. The amount of Ni and Cr ions released in all test solutions decreased day by day during 15 days period. The amount of Cr ions released in solution for all 15 days period was lower than Ni ions.

P455
A New Technique in the Production of Dental Models:
A Vacuum Cabin
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Aim: The purpose of this in-vitro study was to evaluate and compare four different pour techniques on the physical properties of dental stones.

Material and Methods: ADA type IV dental stone was used to make a dental cast. Tooth preparation was performed on the prefabricated lower jaw between tooth number of 43 and 33. Impression was taken using Wash technique with C type silicon impression on the prepared teeth. Using four different techniques (manual, vacuum mixer, vacuum mixer + vacuum suction cabin and cabin) on the vibrator machine, ADA type 4 dental plaster was poured into silicone impression. After samples were taken of the impression, the bubble countering was performed using 40x stereomicroscopy. Sixty millimeter long 30 mm diameter hollow cylinder block made of Teflon mold was prepared for mechanical test. ADA type IV dental stone was poured in the circular teflon cylinder block made of Teflon mold was prepared for mechanical test. ADA type IV dental stone was poured in the circular teflon mold with four different techniques mainly handed, vacuum mixer, vacuum cabin and combination of vacuum mixer and cabin. A total of 60 specimens were under three point bending test. One way ANOVA showed significant differences between groups both bubble countering (p < 0.001) and mechanical test (p < 0.05).

Results: The vacuum cabin, a new technique, produced smooth and bubble free dental cast. Using the vacuum cabin with combination of vacuum mixer, increased the physical properties of dental cast.

P456
Microtensile Bond Strength of All-Ceramics with Different Core-Veneer Ratio
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Aim: To investigate the bond strength for differing core (Tc)/veneer (Tv) thickness ratio (1 mm/3 mm; 2 mm/2 mm; 3 mm/1 mm) in all-ceramic systems with microtensile bond strength test method (MTBS).

Materials and methods: Three different veneering ceramics, two of which were feldspathic and the other fluorapatite, respectively with their corresponding cores, namely zirconium-dioxide (Zirkonzahn Gmbh) (Z), glass-infiltrated alumina (In-Ceram Alumina, Vita) (A) and lithium-disilicate (IPS Emax, IvoclarVivadent) (E) were used for MTBS test. Ceramic cores (8 × 8 mm) (N = 9) were fabricated according to the manufacturers’ instructions [core thicknesses for each group: 1 mm (Z1, E1, A1), 2 mm (Z2, E2, A2), 3 mm (Z3, E3, A3)]. The veneering ceramics (3, 2 and 1 mm thickness) were condensed in stainless steel moulds and fired. Ten non-trimmed beam rectangular specimens were obtained from each block (n = 10). The specimens were stored in distilled water (37°C, 7 days). Bond strength tests were performed in the universal testing machine (Autograph, Shimadzu, Japan, cross-head speed:1 mm/min). The bond strengths (MPa ± SD) were recorded and statistically analyzed (ANOVA, Post Hoc Dunnett T3; α = 0.05). The fracture sites were examined with scanning electron microscopy (SEM) (JEOL JSM-5200, Japan).

Results: The mean MTBS values of E2 group were significantly higher (14.04 ± 3.58) than the other groups instead of E3 (11.91 ± 3.04) and A2 (9.59 ± 1.81). Lowest mean MTBS value belonged to group A3 (7.80 ± 1.14). SEM revealed predominantly adhesive failures at the core/veneer interface.

Conclusion: Tc/Tv ratio was a dominant controlling factor for the failure initiation site in bilayered ceramic discs. Tc and Tv should be considered to prevent mechanical failure of the ceramics.

P457
Composites Roughness and Microhardness After Different Bleaching Techniques
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Aim: Evaluate roughness and microhardness of SonicFill™ (Kerr), and compare it with FiltekSupremeXTÉ™ (3M ESPE) after two bleaching regimens.

Methods and materials: Sixty cylindrical specimens (10 × 2 mm) of each composite were prepared and divided into six groups (n = 20). Groups 1, 2: no treatment. Groups 3, 4: 10% carbamide peroxide (CP). Groups 5, 6: 35% hydrogen peroxide (HP) plus LED. After treatments, specimens were thermocycling (300 cycles, 5°C/55°C, dwell time 30s). Mechanical roughness tester was employed to measure the surface roughness parameters and Vickers test to measure microhardness.

One-Way-ANOVA, Tukey and Bonferroni methods with a significance level of 5% were used for the statistical analysis.

Results: For SonicFill™, there was no statistically significant difference in microhardness between the control group (1) and the bleached groups (3, 5), but there was difference between CP and
HP treatments; for FiltekSupremeXTE™ there was no significant difference in microhardness among all groups.

There was no significant difference in Ra and Rq among all groups. Rz parameter showed no statistically differences among all groups for SonicFill™ but, in Filtek SupremeXTE™ there was a significant increase between control and bleaching treatments; Rsk showed no statistically differences among all groups for SonicFill™ and Filtek SupremeXTE™, except for 2 and 4, where the Rsk increased with CP.

**Conclusion:** The microhardness of FiltekSupremeXTE™ is less affected by bleaching than SonicFill™.

Both bleaching treatments affects Rz in FiltekSupremeXTE™ contrary to SonicFill™, but only the CP treatment affects the Rsk in FiltekSupremeXTE™ with no significant effect in SonicFill™.

### P458

**Microleakage of Pressable and Machinable Ceramic Inlays**

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**Purpose:** The aim of this study was to evaluate microleakage of pressable and machinable ceramic inlays luted with two different adhesive resin cement.

**Materials and methods:** Forty extracted caries-free human molar teeth were used in this study. Molars were prepared for Class II mesio-occlusal-distal (MOD) inlays with enamel gingival margins. Teeth were divided into two groups according to restoration technique; machinable or pressable indirect ceramic inlays, and further divided into two groups again for luting cement; self adhesive resin cement (RelyARC), adhesive resin cement (Rely X U200), (n=10). In machinable ceramic group teeth were received feldspar ceramic inlays made with a CAD/CAM system. In pressable ceramic group teeth were received leucite glass-ceramic inlays made by a dental laboratory. After luting procedure restored teeth were stored in distilled water and basic fuchsin solution (0.5%) each for 24 h at 37°C respectively. Than the teeth were sectioned mesiodistally with a diamond wafering blade mounted on a low-speed saw. Images of restored tooth sections were captured with a digital camera and a five-point scale was used to record microleakage scores. Data were analyzed using one-way ANOVA and Tukey's HSD post hoc tests statistically (p=0.05).

**Results:** There were significant differences within restoration techniques and luting cements. Pressable inlays luted with Rely X ARC showed the highest, and machinable inlays luted with Rely X U200 showed the lowest resistance to microleakage.

**Conclusion:** Restoration techniques and luting procedures directly affects the microleakage performance, so it is important to choose proper material in dentistry.

### P460

**Numerical Analysis of Damage Mechanics of Dental Trilayer Systems**

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**Purpose:** To find the optimum combination of materials and thicknesses to provide a tough, damage resistant multi-layer system with numerical methods (XFEM), without the need of exhaustive experiments which are difficult or costly to model.

**Materials and methods:** Extended Finite element method (XFEM) is used to assess the critical loads for the onset of damage modes such as radial cracks, cone cracks and plastic deformation in dental prostheses, consisting of a spherical indenter contacting a brittle outerlayer (porcelain) /metal (Pd/Co/Au alloys) -core/dentin-substrate trilayer system in concentrated loading. XFEM provides flexibility in modeling, as crack need not be aligned with the element edges. XFEM in particular not only has the ability to successfully solve crack propagation problems but also can model crack initiation process. The overall thickness of metal (dm) and porcelain (dp) layers is assumed to be 1.5 mm (dm+dp).

**Aim:** The aim of this study was to evaluate the color stability of five different resin composites after immersing in three different soft-beverages for 30 days.

**Materials and methods:** Two hundred disk-shaped specimens (diameter:10-mm and thickness:2-mm) were made from five different resin composites (FiltekZ50, TetricN-Ceram, ClearfilMajesty-Esthetic, CavexQuadrantUniversalLC, ClearfilAP-X). Each specimen was cured under the mylar strips for 20 s from each of top and bottom surfaces. All of the specimens were stored in distilled water for 24 h at 37°C. The specimens were polished with a multi-step polishing discs (Optit disc, Kerr, CA, USA). Color measurements of each specimen were performed using a spectrophotometer (VitaEasyShade) according to the CIELSEB* color scale at baseline and after 30 days of immersion in three different soft-beverages (Redbull, Coca-Cola, and Dimes-Lemonade). Control groups were stored in distilled water during the study. Color changes (ΔE values) of the groups were recorded. The data were statistically analyzed using one way repeated measures ANOVA and Bonferroni correction tests (SPSS18.0; p = 0.05), as well as a multivariate analysis (GeneralLinearModel) to test the influence of composite type, beverage type and both together.

**Results:** Significant differences were observed at baseline between the five different resin composites (p < 0.05). There were statistically significant differences between the ΔE values of the experimental groups after 30 days of immersion (p < 0.05). The effect of composite type (EtaSquaredValue[ESV] = 0.691) on ΔE values of the goups was the highest followed by composite type together with beverage type (ESV = 0.296) and beverage type (ESV = 0.147) respectively.

**Conclusions:** The tested soft-beverages in the present study caused color changes at a 30-day evaluation period for the tested resin composites.
Results: It is found that harder and stiffer metal core has the higher critical load for radial cracks. Furthermore, it can be inferred that thinner metal layers are more susceptible to radial cracking, while thicker ones are more exposed to cone cracking. Yielding of metal core makes additional flexural stress at overlaying brittle surface and consequently, facilitates radial cracks.

Conclusions: Generally speaking, the minimum thickness of porcelain layer is recommended to be 0.5 mm, avoiding the structure from cone cracks. Furthermore, the metal layer shouldn’t be too thin to protect dentin and inhibit radial cracking. Finally, hardness of metal is better to be high sufficiently to prevent it from plastic deformation.

Aim: The aim of the present study was to determine the relationship between wear resistance of dental materials and their hardness and elastic modulus.

Material and methods: For the aim of this research five dental composites (Filtek Ultimate “3M ESPE”, Filtek Silorane “3M ESPE,” Herculite-XRV “Kerr,” Charisma “ Heraeus Kulzer,” Heliomolar “IvoIcer Vivadent”) have been used. The chewing simulator “Sofia” has been used to assess the abrasion resistance employing specially designed samples of each of the materials. Afterwards, the samples have been tested by Nano Indenter G200. Instrumented indentation is based on the indentation hardness test applied to small volumes where displacements are continuously monitored during a loading-unloading sequence. Indentation hardness and modulus are calculated from the load-displacement curves taking into account the geometry of the indenter tip.

Results: The wear extent of the five tested materials after 50,000 chewing cycles has been evaluated with profilometer and the obtained results are: Filtek Ultimate – 47.19 μm, Filtek Silorane – 135.24 μm, Herculite-XRV – 67.55 μm, Charisma – 132.85 μm, Heliomolar – 87.27 μm. The values of modulus of elasticity were defined for each of the samples. The indentation hardness (H) of the investigated materials is: Filtek Ultimate – 1,029 GPa, Filtek Silorane – 0.703GPa, Herculite-XRV – 0.605GPa, Charisma – 0.503GPa, Heliomolar – 0.465GPa.

Conclusions: For the five studied composite restorative materials there is no apparent linear relationship between the wear extent and the material hardness and modulus of elasticity. Essential role for the material deterioration have the adhesive and fatigue wear mechanisms observed during the experiment fretting.

Aim: The aim of this in vitro study to assess the microleakage of class V cavities restored with compomer, a new self-adhesive flowable composite, a nanohybrid composite, a nanohybrid flowable composite.

Methods and materials: Thirty standardized Class V box cavities were prepared on the buccal surface of maxillary incisors. Teeth were randomly assigned into six groups (n = 5). Group I: Grandio + FuturoBond NR (Voco); Group II: Grandio Flow + FuturoBond NR (Voco); Group III, IV and V: Embrace Wet Bond (EWB) (PulpDent) with no adhesive, with FuturoBond NR (Voco) or PrimeBond NT (Dentsply); Group VI: Dytax XF + PrimeBond NT (Dentsply). After finishing and polishing, the teeth were stored in distilled water at 37°C for 30 days, coated with nail varnish, and immersed in a %0.05 basic fuchsin, and then longitudinally sectioned. Dye penetration was measured with a stereomicroscope at ×50 magnification at both coronal and gingival margins. Data were analyzed with Kruskal-Wallis, Mann-Whitney and Wilcoxon tests (p = 0.05).
Results: There is no significant difference for dye penetration surface between all groups in coronal (p = 0.143) and gingival margins (p = 0.198). The application of bonding agent with EWB provided better marginal sealing than those without at class V cavities but it is not significant (p > 0.05).

Conclusions: Both resin-based composites and compomer showed microleakage in Class V restorations. Self-adhesive flowable composite may be used with bonding agent to predict better marginal seal.

P464
Influence of Time and Caffeinated Drinks on Colour Stability of Nanocomposite Resin
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Objective: This study evaluated the influence of time and caffeinated drinks on the colour stability of nanocomposite resin.

Materials and methods: Two nanocomposite resins, Filtek Z350 (3M ESPE) and Grandio (VOCO) of A3 shade were investigated. Hundred and two discs (5 mm × 2 mm) were fabricated using a mold. Fifty-one discs from each brand were polymerized and polished. The discs were then divided into three groups of 17 discs and were immersed in three caffeine mediums; coffee, tea and cocoa at five time intervals; 1, 5, 10, 20 and 30 min. Staining colorimetric value of each disc was assessed by spectrophotometer Minolta CM-C3500. Data from the color change were collected and subjected to statistical analysis by one-way ANOVA (p < 0.05). For immersion time, the data were subjected to post-hoc, Tukey Test (p < 0.05).

Results: Filtek Z350 and Grandio showed significant colour change (p = 0.004) on immersion with caffeinated drinks. The lowest color change of 1 min (0.49 ± 0.19), 5 min (0.61 ± 0.24), 10 min (0.67 ± 0.27), 20 min (0.90 ± 0.30) and 30 min (0.80 ± 0.32) was obtained from Filtek Z350 in coffee medium. Post-hoc, Tukey Test, indicated that there was significant difference in colour changes at 10 min of exposure to all mediums (p value = 0.0001) in Filtek Z350, and as early as 1 min (p value = 0.0001) in Grandio.

Conclusions: Caffeinated drinks significantly affect colour stability of nanocomposite. Filtek Z350 showed color change at 10 min and Grandio at 1 min after exposure to all mediums.

P465
Analysis of Reasons for the Placement and Replacement of Restorations Provided By Selected Dental Practitioners
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Aim and objective: The aim of this study was to report the reasons for placement and replacement of direct restorations in public dental services in Turkey.

Materials and methods: A group of dental practitioners working in public dental services were invited to take part in the study. Each participant was asked to record the reason for placement or replacement of restorations from a list of potential reasons. In addition, Class and materials used for each restoration placed and replaced also recorded.

Results: A total of 58 dentists were contacted and 47 responded. Details of the reason for placement or replacement was received on 4096 restorations; 84% of these were first-time restorations and 16% were replacement restorations. The reasons for placement of the restorations were principally primary caries (96%), followed by non-carious defects (%2) and other reasons (%2). Of these, 34% were Class I, 45% were Class II, 21% were Class III, 3% were Class V. The clinical diagnosis of secondary caries (32.5%) was the main reason for replacement of all types of restorations studied, followed by pain (19.2%) and lost of restorations. Resin composite (58%) was the most commonly used restorative material followed by amalgam (37%) and with a minimal use of glass ionomer cement (2%).

P466
Effect of Hemostatic Agent on the Bond Strength of Adhesives
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Objectives: The aim was to determine the effect of blood contamination and hemostatic agent application on the shear bond strength (SBS) of different adhesives to dentin.

Materials and methods: Seventy-two extracted human molars were used in this study. Teeth were mounted acrylic in moulds. Mesial and distal surfaces were removed to obtain flat dentin surfaces (n = 144) and grinded with a 600 grit sandpaper. The samples were randomly divided into four main groups (N = 36) based on the adhesive system and application procedure. Group I: Single Bond 2 (etch-and-rinse). Group II: Clearfil SE Bond (two-step self-etch). Group III: Single Bond Universal (multimode, etch-and-rinse). Group IV: Single Bond Universal (multimode, all-in-one self-etch). Subgroups composed of no treatment (control), blood contamination and blood contamination-hemostatic agent applications. Resin cylinders (Filtek Z350) were bonded to the dentin surfaces according to the manufacturers’ instructions. A shear load was applied to the specimens using universal testing machine at a cross-head speed of 0.5 mm/min until failure. Data were analyzed statistically (p < 0.05).

Results: Statistically significant differences were observed between no contamination (control) and blood-hemostatic agent contamination groups for both Single Bond 2 (etch-and-rinse) and Single Bond Universal (multimode, all-in-one self-etch) (p < 0.05). When the adhesive systems were compared to each other, no statistically significant differences were found in all contamination groups and control group for the mean SBS values (p > 0.05).
Techniques on the Microleakage of Composite Laminate Veneers

The Effects of Different Polymerization and Preparation

P467

Bond Strengths of Two-Step Self-Etch Adhesives to Laser-Irradiated and Bur-Cut Dentin

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Objective: To evaluate the microtensile bond strength (μTBS) of two-step self-etch adhesive systems to bur-cut and Er:YAG laser-irradiated dentin after water storage and thermocycling.

Materials and methods: Seventy-two-third molars were used in this study and they were randomly divided according to cavity preparation method (bur-cut and Er:YAG laser). Two-step self-etch adhesive systems (Clearfil SE Bond, AdheSE and Adper SE Plus) were used to bond the composite to dentin. Following the adhesive procedure, the specimens were subdivided according to aging conditions (24 h in water control (C), 6 months of water storage (WS) and 10,000 thermocycles (TC)). μTBS was determined in a universal testing machine. Three-way ANOVA, independent samples t-test and post hoc comparisons test (α = 0.05) were performed on all data.

Results: No significant difference was found in μTBS between bur-cut and Er:YAG laser-irradiated dentin (p > 0.05) In addition, there was no statistical difference in μTBS between C, TC, and WS specimens (p > 0.05). The highest μTBS to dentin was observed in both laser-irradiated and bur-cut cavity preparation methods in Clearfil SE Bond group.

Conclusions: Neither bur-cut or Er:YAG laser-irradiated dentin was affected by the aging methods used to simulate degradation of the adhesive interface. Er:YAG laser treatment may be used as an alternative cavity preparation method.

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The Effects of Different Polymerization and Preparation

Techniques on the Microleakage of Composite Laminate Veneers

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Purpose: The purpose of this study was to evaluate the correlation of the direct and indirect polymerization technique and different preparation techniques (window, Feather, Bevel, incisal overlap) to microleakage for composite laminate veneers.

Methods and Materials: Eighty-four caries free human maxillary central incisors were randomly assigned to 12 groups (n = 7) and designed with four different preparation techniques (1: window type, 2: feather type, 3: bevel type, 4: incisal overlap type). Nanohybrid resin composite was used for preparation. A1 shade was chosen for standardization. Group A; Composite laminate veneers polymerized using direct light curing. Group B; Composite laminate veneers polymerized through indirect polymerization with a combination of pressure, light and heat using a light cup and heat cup, Group C; Composite laminate veneers polymerized using direct polymerization and additionally heat cured in an oven. The specimens were submitted to thermocycling, coated with nail varnish, and then immersed in 5% basic fuschine solution for 24 h. Following that all specimens were immersed in 65 nitric acid solution for volumetric dye penetration test. Samples diluted with distilled water and centrifuged. The clearest parts of the solutions were received and microleakage determined by a spectrophotometer (wavelength 600 nm). Data were analyzed by two way ANOVA and Tukey post hoc multiple comparisons test (p < 0.05).

Results: Composition of direct and indirect polymerization techniques revealed no statistically significant difference between composite laminate specimens (p > 0.05). There were significant difference between preparation technique (p < 0.05). Microleakage value of window type was lower than the other preparation techniques.

P469

Temperature Rise During Composite Resin Polymerization at Different Curing Times and Curing Modes

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Objective: This study evaluated temperature rise in silorane- (Filtek Silorane) and dimethacrylate-based (Filtek Z550) composite resin systems at different curing times and curing modes.

Materials and methods: Forty dentin disks (1.5 mm thickness, 8 mm diameter) were prepared from sound human third molars. Composite resins polymerized with a LED light curing unit (LCU), in two modes (Plasma mode 3,6,9,+2 s/Normal mode 10,20,30,+2 s). Temperature rise in the dentin samples under the composite resin disks was measured using a K-type thermocouple wire connected to a data logger. Differences (ΔT) between baseline and each time interval were recorded. Data were analyzed using ANOVA and the independent sample t test (α = 0.05).

Results: There were significant differences in mean temperature rises between different modes and polymerization times (p < 0.05). Light polymerization of silorane-based composite resin (Filtek Silorane) resulted in significantly higher temperature rises than in dimethacrylate-based composite resin (Filtek Z550) for each polymerization time interval and curing mode (p < 0.05).

Conclusion: With the exception of two groups (Filtek Silorane baseline/30 s and Filtek Silorane baseline/30 + 2 s), maximal temperature increase determined in all groups was not critical for pulpal health.
P470
Effects of Cavity Configuration and Flowable Composite Liner on Microtensile Bond Strength to Dentin
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Objective: Due to polymerisation shrinkage of resin based composites, a high configuration factor in deep Class I cavities leads to a certain amount of stress when the material is bonded. The aim of this in vitro study was to evaluate the influence of C-factor and intermediary flowable composite liner on bonding to dentin.

Methods: Forty extracted human third molars were randomly divided into two groups. Class I cavities and flat dentin surfaces on the same dentin depth were prepared and further divided into four subgroups according to the employed adhesive/composite combination. Two adhesive systems Solobond M (Voco) or Clearfil SE Bond (Kuraray) were used in conjunction with a composite (Herculite XRV, Kerr) placed incrementally. A flowable composite GrandioSO Heavy Flow (Voco) or Clearfil Majesty Flow (Kuraray) was applied as a liner in half of the teeth of each group with their corresponding adhesives. Four stick specimens with 1 mm² of bonding area were prepared from the center of the each tooth. All specimens were thermocycled for 5000 cycles between 5 and 55°C and subjected to micro-tensile bond strength (TBS) test.

Results: Kruskal Wallis and Mann Whitney U tests were used for the statistical analyses. The adhesive systems evaluated were not significantly different (p > 0.05). The flat surface groups exhibited higher bond strengths than the cavity groups. No statistical difference was seen between the groups with and without flowable composite liner (p > 0.05).

Conclusion: Increasing C-factor negatively effected the TBS. Using a flowable composite liner is an effective technique to improve the TBS.

P471
Effects of Surface Conditioning Methods on Repair Bond Strengths of Amalgam Restorations
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Objective: This study tested the bond strength of a resin cement to a fresh and an aged amalgam after six conditioning methods using shear test method.

Materials and methods: One hundred and twenty specimens were prepared by filling the amalgam into a teflon split mold Then specimens were divided into two main groups (fresh and aged). For aging, 60 specimens were subjected to 5,000 thermocycles. Then groups were divided into six subgroups according to surface conditioning method used. In this way, 12 groups were obtained. Gr1- fresh amalgam- Al2O3+ alloy primer; Gr2- fresh amalgam- Frez; Gr3- fresh amalgam -silica coating + Silane; Gr4-fresh amalgam- Laser; Gr5- fresh amalgam-silicon carbide (Control); Gr6-fresh amalgam- Al2O3+ silane; Gr7-aged amalgam- Al2O3+ alloy primer; Gr8-aged amalgam-Frez; Gr9-aged amalgam- silica coating + Silane; Gr10- aged amalgam-Laser; Gr11- aged amalgam-silicon carbide (Control); Gr12 aged amalgam-Al2O3 + silane. After conditioning of the surfaces with related protocols, the bonding agent was applied. The resin composite was bonded to amalgam by use of molds (inner diameter: 3.6 mm and height: 4 mm).

Then, the samples were attached to the jig of universal testing machine with a notched blade attached to a compression load. Shear force was applied as close as possible to the surface of the substrate at a crosshead speed of 0.5 mm/min until fracture occurred.

Results: Shear bond strength test method results yielded with the different surface conditioning methods showed statistically significant differences (p < 0.0001). Silica coating followed by silanization showed higher bond strength results compared to those of other conditioning methods.

P472
Preventing Microbial Adhesion by Different Coating Materials on PMMA
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Objectives: The aim of this study was to investigate the effect of different ceromers on denture base acrylic resin in the inhibition of oral microbial adhesion.

Methods: Heat polymerized acrylic resin was used in this study. For the evaluation of the antimicrobial activity, 80 standardized acrylic resin specimens were obtained. Each specimen was prepared to a uniform size (10 mm • 10 mm • 2 mm) and polished using silicon carbide abrasive paper up to #1000 under running water. Specimens were divided into four groups (n = 20): non-coated group, Glimo-Teos coated group, a Glimo-Teos + ZrO2 coated group and a Glimo-Teos+ TiO2-coated group. Specimens were submitted to the adherence assay with C. albicans (ATCC 90028). Adhered cells were detached from the acrylic resin surface using ultrasonic waves in phosphate buffered saline solution (PBS). This cell solution was serially diluted in PBS and plated on medium.

Descriptive data were analyzed by means of one-way ANOVA (parametric approach), α = 5%. Post hoc multiple comparisons were performed according to Tukey HSD test (5%).

Results: There were significant differences on Glimo-Teos +ZrO2 (4.69 ± 0.2) group when compared to other groups (p < 0.05), but no statistically significant differences were found among the Glimo-Teos (5.45 ± 0.3), Glimo-Teos + TiO2 (5.29 ± 0.2) and Glimo-Teos + ZrO2 (5.26 ± 0.2) groups (p < 0.05).

Conclusion: Results indicate that Glimo-Teos +TiO2 coating is suitable for clinical application, but further studies using different test methods are needed for this coating material.
Evaluation of Cytotoxicity of Ceromer-Coated PMMA by Real-Time Cell Analysis

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Objective: The aim of this study is to evaluate the cytotoxicity of various ceromer coated PMMA by real-time cell analyzer.
Methods: Forty-eight disc specimens (5 × 2 mm) of heat polymerized acrylic resin were prepared according to ISO 10993–5 protocol. Six groups were formed; heat-polymerized acrylic resin, post-polymerization heat applied group, Glymo+TEOS, Glymo+TEOS+ZrO2, Glymo+TEOS+TiO2 and Polymer A174 + TEOS coated acrylic groups. After the sterilization, materials were incubated in Dulbecco’s modified eagle’s culture medium for 1, 4 and 7 days. A real-time cell analyzer was used to evaluate the cell survival. After seeding 100 ml of the L-929 fibroblast cell suspensions into the wells (20,000 cells/well) of the E-plate 96, the cells were exposed to 100 ml of extracting solution containing the components released by the acrylic resins (1/1 and 1/2 dilutions) and monitored every 1 h for 85 h. The statistical analyses used for the proliferation experiments were one-way analysis of variance (ANOVA) and Tukey-Kramer multiple comparisons tests.
Results: None of the studied groups were found cytotoxic for both dilutions and different time intervals (p > 0.05).
Conclusion: None of the used coating agents were found to be cytotoxic. Further studies about the cytotoxicity of ceromers would be helpful to better understand the biological risks and to improve the biocompatibility of the ceromers.

The Effect of Coating with Different Ceromers on the Mechanical Properties of PMMA

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Objective: The aim of this study was to evaluate the transverse and impact strength and elastic modulus of heat-polymerized acrylic resin after coating with different ceromers.
Methods: Transverse strength and modulus of elasticity test specimens were prepared in the dimensions of 65 × 10 × 2.5 mm (5 groups, n:10). The dimensions of the impact strength test specimens were 60 × 7.5 × 4 × mm (5 groups, n:10). Test group specimens were coated with Glymo-TEOS, Glymo-TEOS-TiO2, Glymo-TEOS-ZrO2 and A174-TEOS, control groups were non-coated.
Results: Glymo-TEOS-TiO2 and A174-TEOS had significantly increased the transverse strength of PMMA. All ceromers had caused statistically significant increase in the elastic modulus of PMMA. While the Glymo-TEOS-ZrO2 had significantly decreased the impact strength, the increase in the strength values of other ceromers was not statistically significant.
Conclusion: Coating with ceromers had substantially improved the mechanical properties of PMMA.
Effect of KTP Laser and Ozone in Primary Root Canals

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Aim: The objective of this study was to evaluate the antimicrobial activity of KTP laser and gaseous ozone in experimentally contaminated root canals of primary teeth.

Materials and methods: Forty eight root canals from primary insisors teeth were selected. After preparation and sterilization, the specimens were inoculated with 10 μl Enterococcus faecalis for 24 h at 37°C. The contaminated root canals were divided into two experimental groups, one negative control group, and one positive control group of 20 teeth each: Group 1, KTP laser group (1,5 W); Group 2, gaseous ozone group (150 s); Group 3, sodium hypochlorite group (NaOCl) (negative control); and Group 4, saline group (positive control). Sterile paper points used to sample bacteria from the root canals were transferred to tubes containing 5 ml of brain heart infusion broth. Then 10 μl suspension was incubated in culture media for 24 h. The colonies of bacteria were counted and data were analyzed statistically using Kruskal-Wallis and Mann-Whitney U tests.

Results: There were statistically significant differences between all groups (p < 0.05). Complete sterilization was achieved in the 2.5% NaOCl group. The number of bacteria was significantly reduced in experimental groups in comparison with the positive control group.

Conclusions: Although KTP laser and gaseous ozone have a significant antibacterial effect on infected root canals of primary teeth, with the gaseous ozone being more effective than the KTP laser, 2.5% NaOCl showed the best antibacterial effect.

The Evaluation of the Bluegrass Appliance’s Effectiveness in Children with Thumb-Sucking Habit

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Aim: The aim of this study is to implement the Bluegrass appliance to children with thumb-sucking habit who do not respond to the reminder treatment, and to evaluate the results.

Methods: Aged between 4 and 11 years, one hundred sixty-one children admitted to the Pedodontics clinic with a thumb-sucking habit were included in the study. The patients were initially given a reminder treatment for 2–3 weeks. The Bluegrass appliance was prepared for 28 children who did not respond to the reminder treatment and who accepted to participate in the study. The required ethical and parental consents were obtained. If the habit was ceased or not, the time for the cessation of the habit, and the 2-year follow-up period were evaluated.

Results: Thirty-two out of 161 patients discontinued the therapy. The reminder treatment failed in 92 patients. Twenty-eight children who did not respond to the reminder treatment accepted to participate in the Bluegrass appliance treatment. Eight patients did not show up for the control examinations, and were excluded from the study. The study was continued with 20 patients. The Bluegrass appliance had a success rate of 72% in children aged between 4 and 6 years, who constituted 65% of all patients. The success rate was lower in children aged between 9 and 11 years, who constituted 35% of all patients.

Conclusion: The effective period for the appliance was determined as 2–3 months. The Bluegrass appliance gave better results, especially in children aged between 4 and 6 years.

Management of Orofacial Infection in Pediatric Patients Attending a Dental Clinic in Ankara

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Introduction: Orofacial infections are common in pediatric patients. Bacterial invasion, chemical irritation, or trauma can cause orofacial infections. The most common cause is dental caries and after that bacterial invasion of the tooth pulp. The inflammation begins with a necrotic pulp and spreads into the surrounding periodontal ligament and bone. The inflammatory process causes bone resorption. Orofacial infections can turn into abscess and may be collected in maxilla-facial region such as submandibular abscess.

Methods and materials: We examined management of orofacial infection on five pediatric patients who attended a dental clinic in Ankara (2010–2012). The average age of the patients was ten. Our patients were three girls and two boys. There were three submandibular abscesses, one buccal abscess and one fossa canina abscess in our events. All of abscesses were occurred by dental caries.

Conclusion: Although orofacial infections affect both sexes equally some studies shows a preponderance of girls. Caries is main etiology for orofacial infections in children. The treatment of choice for orofacial infections of dental origin is root canal therapy for a restorable tooth or extraction for a nonrestorable tooth.
Mean Silness & Löe plaque index was 1.53 (±0.70), mean simplified oral hygiene (OHI-S) Green-Vermillion index was 2.21 (±0.99). An average of 1.35 sextants had healthy periodontal tissue, gingival bleeding was detected in 3.32 sextants, calculus – 1.32 sextants.

Conclusions: Results of this study suggest high caries prevalence and insufficient oral hygiene in Latvian children. The above findings stress the need for an effective program of oral prevention in these children.

P480
Dahl Concept in the Treatment of a Complicated Trauma Case
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Introduction: Vertical dimension is an important factor for satisfactory aesthetic and functional restorations. To increase the vertical distance temporary crowns, orthodontic treatment, extension of the length of crowns and Dahl concept can be applied.

Case: This case report describes treatment procedures for a thirteen year old patient whom vertical dimension decreased after a traumatic injury. As a result of the clinical evaluation, complicated crown fracture on the right central incisor and mobility on the left central incisor was observed. In the radiological evaluation crown root fracture on the left central incisor had diagnosed. After extraction of fractured coronal part of the left central incisor, root canal treatment was initiated for both teeth. The following treatment was planned as fiber post and strip crown restoration. However, during endodontic treatment period, increased overbite was developed. For ideal aesthetic and functional restorations it is planned to increase the vertical dimension. In this case Dahl concept applied as an acrylic anterior bite plane to increase the interocclusal space for available restorations. After using Dahl appliance for 10 weeks, sufficient distance for fiber post and strip crown restoration was obtained and final restorations have done. There was no aesthetic and functional problems during 2 years.

Conclusion: The Dahl concept appears to be safe and avoids performing destructive restorative procedures on compromised teeth.

P482
In vitro and SEM Assessment of Resin Crowns with Post-Core in Primary Teeth
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Aim: This study compared the fracture load, tensile strength, failure mode, fracture extent and SEM evaluation of short post core plus celluloid resin composite crowns on primary anterior teeth.

Materials and methods: A total of 88 extracted primary anterior teeth were used. Mushroom-shaped retention undercut was performed in the root. The teeth were randomly divided into four groups and restored with short post-core plus celluloid crown forms using hybrid, flowable packable composites, and short fiber post plus flowable composite. Half of the teeth in each group were selected for fracture load and tensile strength tests and SEM evaluation. The crowns were fractured or dislodged. Two teeth restored from each group were micrographed under SEM. All data were statistically analyzed.

Results: The fracture load and tensile strength values ranged 232N to 350N and 181N to 224N, respectively. There was a significant difference among the groups for fracture load (p < 0.05), but not significant for tensile strength (p > 0.05). Packable composite exhibited lower values than did those of the other groups. A significant difference existed in failure types among groups. Failure types was predominantly mixed for groups, except for short fiber post plus flowable composite. For failure extents, there was no significant difference among the groups (p > 0.05). A close interface connection was observed in flowable composite group under SEM.
Conclusion: This study showed that the higher fracture load and tensile strength values a short-post plus composite celluloid crown possessed, the lower would be the possibility failure.

P483
Dental Age in A Group of Turkish Children with Tooth Agenesis
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Aim: To determine the development degrees of teeth in children with tooth agenesis and to compare those with children with no tooth agenesis and to give a direction to clinical approaches and forensic sciences and anthropology.

Methods: Files of 452 patients who presented to our clinic and were eventually diagnosed as cases of missing teeth, were reviewed. Aged between 7 and 15 years, healthy patients with at least one congenital permanent missing tooth excluding 3rd molars and complete records with satisfactory panoramic radiographs and similar socio-economic background and ethnic origin were specified. Sixty-six individuals with 1–6 missing teeth and 20 individuals with more than six missing teeth were included in group I and group II, respectively. Forty-two healthy individuals with no tooth agenesis were included in control group. The differences between the dental age estimated by Haavikko’s method and the chronological age were evaluated by statistically. Correlation coefficient between the number of missing teeth and the differences between ages was calculated.

Results: In respect to differences between ages, the differences between group means were statistically significant (p < 0.05). Boys and girls, in group I, group II and control group, were 1.1, 1.7, 0.4 years and 1.2, 1.5, 0.6 years, respectively, more rested in the dental age than the chronological age. Calculated correlation coefficient between the number of missing teeth and the differences between ages was 0.439 and it was statistically significant (p < 0.05). As the number of missing teeth increases, difference between the ages increases.

Conclusions: Our results show that tooth agenesis and it’s severity affect tooth development.

P484
Effects of Er:YAG Laser on Mineral Content of Sound Dentin in Primary Teeth Using ICP-AES Technique
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Aim: The aim of this study was to evaluate the mineral content of sound dentin in primary teeth prepared using an Er:YAG laser at two different power settings.

Materials and methods: The study teeth comprised 33 primary second molars which were randomly divided into three equal groups. The occlusal third of the crowns were cut with a slow-speed diamond saw. The groups were as follows: group A, control group; group B, dentin irradiated with the Er:YAG laser at 3.5 W; and group C, 4 W. The levels of Ca, K, Mg, Na and P in each dentin slab were measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES). One sample from each group was evaluated using scanning electron microscopy (SEM). Data were analysed by one way analysis of variance and Tukey HSD tests.

Results: There were no significant differences among the groups for Ca, K, Mg, Na, and P level, or for the Ca/P ratio (p > 0.05). SEM micrographs indicated that the surface irregularities increased with increased power setting.

Conclusions: Er:YAG laser treatment at two different power setting did not affect the mean percentage weights of Ca, K, Mg, Na, and P level, or the Ca/P ratio.

P485
A Novel Technique for Restoring Infected Anterior Primary Teeth under GA
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Dental caries is the most common chronic disease of childhood & restoration of severely decayed primary anterior teeth is often considered as a special challenge by pedodontists. The principle goal of pediatric restorative dentistry is to restore the damaged teeth to enable them perform normal function and also from an esthetic point of view.

Objective: The aim of this study was to evaluate the clinical and radiographic success new technique for root canal filling of pulpally affected primary anterior teeth.

Methods: Fifteen healthy children 3–5 years old, without sexual variation were included in a cases series study. The children had pulpy involvement upper anterior teeth; all cases were treated under GA.

Root canal cleaning and shaping for the affected teeth followed by filling of the apical one-third of the root canals with Metapex (Meta biodent.) and the rest of the canals and the NuSmile crowns were filled with Fugi IX or Riva luting (SDI) for crown cementation at the same time.

Results: All treated cases showed satisfactory results in terms of clinical and radiographic evaluations over 1 year follow up. None of these cases showed any signs of periapical infection or crown root fracture.

Conclusion: This novel technique may offer a good approach for restoring decayed primary anterior teeth under general anesthesia.

P486
Evaluation of Oral and Dental Status in Children after Bone Marrow Transplantation
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Aim: To assess the count of the number of decayed, missing, filled teeth (DMFT), gingival health, and oral status of children after bone marrow transplantation (BMT).

Materials and methods: Thirty-one patients (10 females, 21 males; mean age = 10.38) treated with BMT and 31 healthy children (18 females, 13 males; mean age = 9.74) were selected for this randomized clinical study. The study protocol was approved by the Research Ethics Committee and written informed consent was obtained from all participants. All dental examinations were applied by one calibrated examiner and performed under natural light using a dental mouth mirror and a metallic dental probe. The dental examinations of the study group were applied 100 days after BMT. The DMFT, Plaque Index (PI), Gingival Index (GI) and Bleeding on Probing (BOP) values were recorded. For the statistical analysis and calculations SPSS for Win (SPSS, Ver. 15.0, Chicago, IL, USA) was used. The level of significance was set at p ≤ 0.05.

Results: The differences between PI, GI, and BOP (p = 0.05) values were not statistically significant in both groups. Although DMFT index values were lower in children treated with BMT compared to children from the control group, the difference between the two groups was not statistically significant (p = 0.054).

Conclusions: Although children in study group have a high risk for dental caries and periodontal problems, there were no differences in all indexes values between both groups due to the fact that periodic oral examination was performed by a dentist before and after BMT.

P487 Multidisciplinary Approach for Treatment of Fusion Anomaly
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Aim: Tooth abnormalities consist depending on hereditary, trauma, systemic or local factors during the period of development of the teeth. Fused teeth may occur when tooth germs contacted with adjacent tooth germ by physical acts.

This clinical case is presented anomaly of supernumerary tooth and maxillary permanent incisal tooth.

Case report: Nine-years-old male patient was admitted to the Dicle University Department of Pediatric Dentistry for complaining of aesthetic. After clinical and radiographic examination were realized fusion between maxillary incisal teeth with supernumerary teeth. The patient’s was evaluated with maxillofacial surgeon. Then were decided to take the tooth at palatal position. Restorative treatment of the patient’s was performed remaining teeth. There was no symptoms at clinical and radiographic follow-up after 6 months.

Conclusion: Especially dental abnormalities appear in the anterior region importance, because cause problems of function, aesthetics, phonation and orthodontic. Teeth abnormalities should be evaluated clinically and radiologically and treated multidisciplinary approach. Early diagnosis and treatment of these anomalies, prevents unwanted problems in the future.

P488 Relationship Between Body Mass Index and Dental Caries Among Children in Istanbul
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Aim: The aim of this study was to investigate the association between age-and gender-specific body mass index (BMI-for-age) and dental caries among children aged 2–12 years in Istanbul, Turkey.

Methods: The dmft/DMFT index (following World Health Organization criteria) were used to assess the subjects’ dental caries experience. The BMI (Body Mass Index) percentile was calculated using BMI-for-age criteria as underweight (<5th percent), normal-weight (5th-85th percent), at risk of being overweight (≥85th and <95th percent) and overweight (> or ≥ 95th percent).

Results: Of children examined, 54.3% were normal-weight, 22.2% were at risk of being overweight, and 23.3% were overweight. The mean dmft was 3.32 and the mean DMFT was 0.36. There was no significant difference between dmft/DMFT scores amongst the BMI-for-age groups.

Conclusion: Almost one in five children (22.2%) examined were deemed to be at risk of being overweight, or were classified as overweight (23.3%). There was no association between dmft/DMFT scores and BMI-for-age scores.

P489 Shear Bond Strength of Composite Resins on Primary Tooth Enamel
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Aim: The aim of study was to determine the shear bond strengths (sbs) of composite samples polymerized with halogen light source which were bonded to primary molar’s enamel with total-etch and self-etch bonding systems.

Materials and methods: In study, a total-etch bonding system (Single Bond, 3M/USA), a self-etch bonding system (One-Step, Bisco/USA) and a composite resin material (Charisma, Heraeus-Kulzer/Germany) were used. Samples were bonded with total-etch and self-etch bonding systems on teeth’s surfaces (n = 10), and they were polymerized for 40 s with a conventional halogen light source (Hilux 200, Benlioglu/Turkey, 450 mW/cm²). Sbs values were tested with an universal test device (LRX-Universal, Lloyd Instruments/England, 1 mm/min). Values were initially measured as “Newton (N),” then they were calculated as “MegaPascal.
Rare Hamamy Syndrome: Clinical and Dental Findings
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Aim: Hamamy syndrome is a rare genetic disorder. Severe hypertelorism with midface prominence, myopia, mental retardation, and bone fragility can be caused by homozygous mutation in the IRX5 gene on chromosome 16q11.2. Hanan Hamamy discovered the syndrome in 2007.

Clinical reports: In this paper we describe the clinical and dental findings of this syndrome in a 10 year old boy referred to the dental clinic because of severe pain in Malatya, Turkey. His parents were consanguineous marriage. His brother also affected syndrome. Clinical findings was diagnosed mild hypertelorism with midface prominence, and osteopenia with repeated fractures. Myopia, hearing loss, mental retardation, heart disease, and blood disorder were not detected. Dental finding included enamel hypoplasia, severe dilacerated maxillary and mandibular incisor and lateral teeth, delayed eruption of teeth, taurodontism, loss of lamina dura and malocclusion. The dental treatment included root canal treatment, composite restorations, extractions and removable prostheses.

Conclusion: This paper highlights features of Hamamy syndrome and its dental rehabilitation.

Intracoronal Radiolucent Lesion Treated with Endodontic Regenerative Therapy
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Aim: The aim of this report is to introduce the regenerative endodontic treatment protocol using a variation of the triple antibiotic paste of an immature tooth with intracoronal radiolucent lesion.

Case: A 10 year-old girl was referred to Gazi University Department of Pediatric Dentistry with complaint about mandibular right second premolar tooth that developed abscess. After radiographic examination, incomplete root formation (1/3 root formation) was diagnosed. The tooth was irrigated with 5.25% sodium hypochlorite with minimal instrumentation, followed by triple antibiotic (metronidazole, ciprofloxacin and amoxicillin) paste dressing. Instead of minocycline that principally recommended for regenerative procedures, amoxicillin is used in order to avoid the discoloration of the crown. At a subsequent visit, the antibiotic paste was removed, a blood clot aroused in the canal by irritating periapical tissues and the canal was sealed with BioAggregate (Innovative BioCeramix Inc. Vancouver, British Columbia Canada), glass ionomer cement and composite resin.

Conclusion: According to the 12 months radiographic and clinical follow-ups, the tooth was symptomatic with no discoloration, periapical radiolucency was healed and the root continued to develop.

Revascularization of Immature Permanent Incisors with Necrotic Pulps
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Aim: The purpose of this study was to evaluate the clinical efficacy of 3Mix-MP paste on pulp revascularization for necrotic immature anterior permanent teeth.

Materials and methods: The study was carried out with ethical committee approval and the informed consent form was signed by the parent or the guardian. Thirty teeth of twenty-three patients (8–14 ages), each with an immature permanent tooth with pulp necrosis, were recruited. A triantibiotic mix was used to disinfect the pulp for 2 weeks. Then a blood clot was created in the canal, over which mineral trioxide aggregate was placed. Patients were recalled periodically (1, 3, 6 and 12 months).

Results: One of the patients did not attend any recall appointments. Eleven teeth were excluded from the study (as a result of pain or failure to induce bleeding after canal disinfection) and instead received a standard apexification procedure. After follow-up sessions, the remaining teeth (n = 18) were found to be asymptomatic, apical periodontitis was resolved and there was radiographic evidence of proceeding root development.

Conclusion: Revascularization could be effective for managing immature permanent teeth with pulp necrosis with appropriate case selection.

Clinical Evaluation of Two Different Restorative Materials in Primary Teeth
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**Introduction:** The aim of this study was to evaluate clinical success of primary teeth class II lesions restored with compomer and giomer composite resin followed up for 24 months.

**Materials and methods:** This study was carried out on 74 primary molars of 23 children (13 boys, 10 girls) in the age range of 5–7 years. The class II lesions in primary molars of a patient were restored using compomer (Dyract AP) and giomer (Beatiful). Restorations were evaluated according to FDI-criteria and their survival rates were determined. Data were analysed with Pearson chi-square, Kaplan-Meier and Wilcoxon (Breslow) tests (α = 0.05).

**Results:** The failure rates of general, aesthetic, functional and biological evaluation results of compomer were 33.3%, 19.4%, 33.3%, and 14.9% and of giomer were 15.8%, 7.9%, 15.8%, and 13.2%, respectively. There was not any statistically significant difference in restorative materials at the end of the 24 months. Functional failure was the main factor in restorative material failure.

**Theme: Dental Treatment & Restorative Dentistry: Periodontics**

**P494**

**MDR1 Gene Polymorphisms and Drug Induced Gingival Overgrowth**

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**Objective:** Gingival overgrowth is a known side effect of particular drugs. However, pathogenesis of this side effect is uncertain. P-glycoprotein (P-gp) is a transport protein that has an important role on the effectiveness and distribution of these drugs. Polymorphisms of the gene (MDR1) coding P-gp can alter the expression and function of this protein. The aim of the present study was to investigate the certain MDR1 polymorphisms as risk factors for gingival overgrowth.

**Methods and Materials:** One hundred and six patients including 36 cyclosporine, 25 phenytoin, 25 nifedipine and 20 diltiazem users were enrolled in the study. Periodontal clinical parameters and the degree of gingival overgrowth were evaluated. Genetic analysis of C3435T and G2677/A polymorphisms were also investigated from blood samples by PCR.

**Results:** As expected, all clinical periodontal parameters were significantly higher in patients with gingival overgrowth in all drug groups, except diltiazem. However, any statistically significant association between single nucleotide polymorphisms in C3435T and G2677/A polymorphic regions of MDR1 gene and gingival overgrowth was not detected for all drug groups.

**Conclusions:** According to the present results, it can be suggested that MDR1 C3435T and G2677/A polymorphisms are not risk factors for drug induced gingival overgrowth. Due to the limited number of the participants, further studies conducted on larger patient groups may clarify the impact of the MDR1 gene polymorphisms on drug induced gingival overgrowth.
surgery and others for flapless surgery. Each patient received etodolac, 600 mg, or placebo randomly 1 h before the surgeries. Pain intensity and discomfort scores were recorded by participants based on a visual analog scale and four-point verbal rating scale at postoperative 1st, 2nd, 4th, 6th, 12th, 24th and 48th hours. Furthermore; patients were suggested to use a rescue analgesic only if the pain was intolerable, and to record it.

**Results:** Etodolac was superior to placebo in both traditional and flapless surgery groups and results were more superior in flapless-etodolac group especially at 2nd, 4th and 6th hours. Rescue medication use was more excessive in traditional-placento-group than others. Moreover, pain and discomfort scores and rescue medication were almost similar in traditional-etodolac and flapless-placebo groups.

**Conclusion:** The findings of this study suggest that the preemptive single dose etodolac, 600 mg, medication was considerably effective in the management of postoperative pain and discomfort following both surgeries.

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**P497**

*Effects of Two Different Periodontal Recall Programs on Oral Hygiene and Gingival Health of Patients Undergoing Fixed Orthodontic Treatment: A Year Follow Up*

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**Objective:** To compare the effects of two different periodontal recall programs on gingival health of patients undergoing fixed orthodontic treatment.

**Materials and methods:** Fifty-four adolescents, who will be undergoing fixed orthodontic treatment, were divided into two equal groups (Group 1, Group 2). Group 1 was selected for periodontal recall program consisting of 4-week intervals, and Group 2 was selected for periodontal recall program consisting of 3-month intervals. The periodontal parameters (plaque index [PI], gingival index [GI] and bleeding on probing [BOP]) were recorded at the baseline and at the all recall appointments during 1 year.

**Results:** All periodontal parameters showed a significant increase from the baseline to the first recall appointment for either group ($p < 0.01$). Group 2 had significantly lower PI, GI and BOP values than Group 1 at all recall appointments ($p < 0.01$).

**Conclusions:** This study emphasized that periodontal recall program consisting of 4-week intervals seemed to be more successful than the recall program consisting of 3-month intervals in terms of periodontal health of patients undergoing fixed orthodontic treatment.

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**P498**

*Severity of Pain During Supportive Periodontal Treatment Using a Er, Cr: YSGG Laser or a Sonic Scaler*

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**Background:** The aim of this study was to evaluate the subjective intensities of pain during supportive periodontal treatment using a Er, Cr: YSGG laser and sonic scaler.

**Methods and materials:** Thirty patients with periodontal pockets ($\geq 5$ mm, at least two areas) following conventional periodontal therapy were treated using a sonic scaler and an Er, Cr: YSGG laser. A visual analogue scale (VAS) was used for pain assessment directly after each treatment procedure.

**Results:** Pain assessment during treatment showed that laser treatment (mean: 0.8, max:3, min:0) caused less pain than the sonic device (mean: 3.8, max: 8, min: 1) ($p < 0.05$) with no difference in the treatment time.

**Conclusions:** The results indicated that using an Er, Cr: YSGG laser during supportive periodontal treatment, painful sensations can be reduced compared with sonic scaler instrumentation.

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**P499**

*Occlusal Correction in a Compromised Periodontium – A Finite Element Study*

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**Background:** Premature contacts on teeth may be a factor in the progression of periodontal disease.

**Aim:** The present study evaluated the effect of premature occlusal contacts and their correction using coronoplasty on the magnitude and distribution of forces in the periodontium. The influence of proximal support was also assessed.

**Materials and methods:** Finite element models of a mandibular molar with normal as well as compromised periodontal support were constructed using ANSYS 11. Four situations were considered: (1) Normal occlusal contacts in a tooth with healthy periodontium (2) Premature occlusal contacts in a tooth with healthy periodontium (3) Same occlusal prematurities in a tooth with compromised periodontium (4) Coronoplasty performed on models to eliminate premature contacts. Each of these models had an additional subcategory of presence of adjacent tooth contact mesially. 100 N force was delivered in the centric occlusal contact points of the teeth. Maximum von Mises stress in the periodontal ligament and bone were then assessed.

**Results:** Occlusal forces, which were axial in direction in centric contacts, increased in magnitude and changed direction in the presence of a premature contact. Higher stresses were observed when there was no adjacent tooth contact. Following coronoplasty, the forces decreased in magnitude. The periodontally compromised tooth without adjacent contact benefitted the most out of occlusal correction.

**Conclusion:** Occlusal correction by coronoplasty may bring about substantial changes supporting healing in a compromised periodontium. Moreover, presence of the adjacent tooth may allow more favourable distribution of loads.
The Effect of Oral Mouthwashes on Dark Pigmented Subgingival Bacteria
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Introduction: Among subgingival dental plaque bacteria, the most aggressive potential have Gram-negative anaerobic dark pigmented bacteria including P. gingivalis, P. intermedia and P. nigrescens. The use of oral antiseptics is widespread in the treatment of periodontal disease in order to reduce the number of microorganisms responsible for their initiation and progression.

Aim: The aim of this study was to evaluate the antimicrobial effect of eight oral antiseptics on dark pigmented bacteria of subgingival dental plaque.

Materials and methods: Fifteen patients suffering from chronic periodontitis were included in the study. Periodontal status and oral hygiene were recorded. Pooled samples of subgingival dental plaque transported in 1 ml thioglycolate broth were inoculated on Schaedler agar for the purpose of cultivation. From the total bacterial cultures, dark pigmented colonies were selected to obtain subcultures. Discs of filter paper, 5 mm in diameter, soaked with examined mouthwashes were placed on the Schaedler agar. Diameter of the growth inhibition zone of bacterial colonies around the disks was measured 7 days following inoculation.

Results: Active oxygen-containing and Gengigel® showed no antibacterial activity on treated bacteria. Other examined mouthwashes (Cura-sept 220®, Colgate Plax®, Perio Aid 0.12®, Perio Aid 0.03%, Vits®, Lacalut®) demonstrated antibacterial effect with no statistically significant difference in diameter of the growth inhibition zone among them.

Conclusion: Most of the examined mouthwashes showed antibacterial effect on dark pigmented subgingival bacteria, which justifies their use in the treatment of periodontal disease.

Improvement of Indexes of Arteriosclerosis with Treatment of Periodontal Disease
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Purpose: We examined the morbidity of periodontal disease in patients who had had carotid echography and measured arteriosclerosis related markers and periodontal disease related markers in the blood serum to more clearly identify the relationship between chronic periodontitis and arteriosclerosis.

Methods and materials: In principle, 12 patients were selected that had chronic periodontitis, who had not received antibiotic on the first visit. Examination of fingertip plasma IgG antibody titers against periodontopathic bacteria was contracted to the Leisure Inc. and it examined the antibody tiers of four types of bacteria (A.a.,P.g.,P.i.,E.c.) by using an ELISA method in which a method described by Murayama et al. (Ad Dent Res, 1988) was modified. The blood serum was separated from peripheral blood by normal methods and tests on arteriosclerosis related markers (C-reactive protein = hs-CRP), TNF-α and adiponectin were contracted to the SMS Corporation.

Results: The average ratio of a pocket of 7 mm or more, in the six males, was 34.1%, and that of females was 5.5%. A correlation between a prevalence of periodontal pockets of 7 mm or more, and a serum antibody titer against P.g., was observed and the antibody titer (6.9) in males was higher than that (2.08) of the females. The average value of the arteriosclerosis related markers in serum were as follows: for males, CRP: 0.134 mg/dl; TNF-α: 1.71 pg/ml; and adiponectin: 8.1 μg/ml, and for females, CRP: 0.091 mg/dl; TNF-α: 1.01 pg/ml; and adiponectin: 17.5 μg/ml.

Covering of a Multiple Miller III type Gingival Recession
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Introduction: The recession of gingiva is increasingly becoming a more prominent condition for patients because of root hypersensitivity, erosion, root caries and aesthetic considerations. The main goal of plastic periodontal surgery procedures is to obtain root coverage and optimal aesthetic appearance. Several new techniques have been used to achieve root coverage for the surgical treatment of multiple adjacent recession type defects. The modified tunnel technique is an alternative technique which has minimizing surgical trauma and achieving predictable aesthetic result. Surgical treatment of class Miller III defects are more challenging, mainly due to loss of inter-proximal bone and soft tissues.

Case: In this case report, a 40 year old female patient had class Miller III gingival recession on her maxillary premolars. The gingival recession defect was treated a modified tunnel technique in combination with a subepitelial connective tissue graft.

Conclusion: The use of a microsurgical concept with minimal invasive surgical technique which improves the success rate of connective tissue grafting and increases the amount of root coverage, reduces surgical trauma and allows more precise approximation of the wound margins.

The Effects of Obesity on Local and Circulating Levels of Tumor Necrosis Factor Alpha and Interleukin 6 at Patients with Chronic Periodontitis
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Introduction: The recession of gingiva is increasingly becoming a more prominent condition for patients because of root hypersensitivity, erosion, root caries and aesthetic considerations. The main goal of plastic periodontal surgery procedures is to obtain root coverage and optimal aesthetic appearance. Several new techniques have been used to achieve root coverage for the surgical treatment of multiple adjacent recession type defects. The modified tunnel technique is an alternative technique which has minimizing surgical trauma and achieving predictable aesthetic result. Surgical treatment of class Miller III defects are more challenging, mainly due to loss of inter-proximal bone and soft tissues.

Case: In this case report, a 40 year old female patient had class Miller III gingival recession on her maxillary premolars. The gingival recession defect was treated a modified tunnel technique in combination with a subepitelial connective tissue graft.

Conclusion: The use of a microsurgical concept with minimal invasive surgical technique which improves the success rate of connective tissue grafting and increases the amount of root coverage, reduces surgical trauma and allows more precise approximation of the wound margins.
Aim: The aim of this study is to evaluate the possible effects of obesity to the local and systemic tumor necrosis factor-alpha (TNF-α) and interleukin-6 (IL-6) levels in patients with chronic periodontitis (CP).

Material and method: According to the study protocol, four groups which each one was consisted of twenty-two subjects were planned as follows: periodontally healthy patients with normal weight (O-P-); patients with normal weight and CP (O-P+); periodontally healthy patients with obesity (O+P-); patients with obesity and CP (O+P+). Serum and salivary samples were obtained a week before the recording of clinical periodontal parameters. Local and systemic levels of TNF-α and IL-6 were measured as biochemically.

Results: In serum and saliva, both TNF-α and IL-6 levels were the lowest in (O-P-) group (p < 0.05). The highest TNF-α and IL-6 levels were observed in (O+P+) group, while only IL-6 levels were statistically significant (p < 0.05).

Conclusion: It was observed that local and systemic TNF-α and IL-6 levels were significantly increased in obese patients with periodontitis. The findings of our study show that obesity may play a role on periodontitis by negatively influencing the inflammatory parameters act in the pathogenesis of periodontal diseases.

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Treatment of Single Tooth Recession with Laterally Displaced Flap: A Case Report
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Introduction: This technique, originally described by Grupe and Warren in 1956 was the standard technique for many years and is still indicated in some cases. The laterally positioned flap can be used to cover isolated, denuded roots that have adequate donor tissue laterally and vestibular depth.

Case: Thirty-two years old female who has 7 mm clinical attachment loss (CAL) on left maxillary canin was treated with this technique. After removing epithelium around the denuded root surface the exposed connective tissue was the recipient site for the laterally displaced flap and we scaled and planed the root surface. First full-thickness after partial-thickness flap was used because of the thickness of the gingiva but the latter is preferable because it offers the advantage of more rapid healing in the donor side and reduces the risk of loss of facial bone height. With a #15 blade, a vertical incision from the mesial of canin and distal of second premolars’ gingival margin was made to outline a flap adjacent to the recipient site. A releasing incisions were made to avoid tension on the base of flap, which can impair the circulation when the flap is moved. After sliding the flap laterally on to the adjacent root we fixed the flap to the adjacent gingiva and alveolar mucosa with interrupted sutures.

The clinical measurements made at baseline, after 2 weeks, 1 and 12 months. The mean coverage of the recesions was 90% and there were no bone loss, dehiscence and fenestration in the donor site.

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Effect of Periodontal Health, Oral-Hygiene and Socio-Demographic Structure on Halitosis
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Objective: The purpose of this study was to evaluate the association of oral malodor with periodontal-health, tongue-coating, oral hygiene practices, smoking and socio-demographic variables and to compare organoleptic-scores (OS) with Halimeter® measurements.

Methods: A questionnaire-survey was conducted to patients who recruited at the Periodontology Department between January and November 2011 by interview. 612 (298 female/314 male) subjects aged 20–80 years (mean-age; 39.07 ± 14.79) were divided into four age-groups (20–34, 35–49, 50–64, 65–80). Subjects self-reported their halitosis, medical-history, oral hygiene habits, education-level and smoking-status. In the clinical examination, values of oral malodor were gathered through organoleptic assessment and by the measurement of volatile sulphur-compounds (VSCs). Plaque-index (PI), calculus-index (CI), bleeding on probing (BOP), pocket-depths, tongue-coating-score (TCS) and decayed-missing-filling-teeth-index (DMFT) were recorded.

Results: The prevalence of halitosis was found 51.9% for the organoleptic assessment (OS ≥ 2) and 54.08% for the Halimeter® measurement (VSCs ≥ 110ppb). There were significant correlation between OS and VSCs values in general-population and age-groups [(r: 0.82), (p < 0.05)]. Significant correlation found between OS-VSCs values and PI [(rOS:0.45;pOS < 0.05), (rVSC:0.41;pVSC < 0.05)], CI [(rOS:0.46;pOS < 0.05), (rVSC:0.40; pVSC < 0.05)] (except 65–80), mean value of pocket depth [(rOS: 0.56; pOS < 0.05), (rVSC:0.61; pVSC < 0.05)], the-deepest-pocket value [(rOS:0.69;pOS < 0.05), (rVSC:0.73;pVSC < 0.05)], TCS [(rOS:0.55;pOS < 0.05), (rVSC:0.44;pVSC < 0.05)] and DMFT (except 35–49, 50–64) [(rOS:0.25;pOS < 0.05), (rVSC:0.23; pVSC < 0.05)]. In addition there were significantly differences between BOP, oral hygiene habits, education-level, age, self-reported halitosis and OS-VSCs values[pOS < 0.05, (pVSC < 0.05)]. For the logistic regression analysis results, the factors most strongly associated with VSCs values are respectively: TCS [(OR:2.85), (p < 0.05)], the deepest pocket value[(OR:2.09), (p < 0.05)] and daily using of dental floss [(OR: 1.87), (p < 0.05)].

Tongue-coating, the deepest-pocket value and daily-flossing were the factors that most strongly associated with VSCs values. Organoleptic score could still be considered as the gold standard for diagnosis of halitosis according to our findings.
Background: In the treatment of endodontic – periodontal combined lesions are comprised as a result of differential diagnosis and unpredictable prognosis. These lesions requires both endodontic therapy and periodontal regenerative procedure. Several techniques and materials present different treatment choices as providing more successful prognosis. In this case report, we present a treatment of an incisor tooth which had an endodontic-peri-odontal combined lesion result of trauma with mucogingival – regenerative approach and the prognosis of treatment in 5 years.

Case: A 20 year old male patient revealed to our Dental Department suffering discoloration on his 41 numbered tooth. Intraoral examination revealed crown fracture and deep Miller II gingival recession with 7 mm probing depth at buccal site and there was an severe apical radiolucency at periapical radiography. Also, the tooth showed no vitality without mobility. In the treatment procedure, firstly non-surgical periodontal treatment completed. Eight weeks later, a large buccally flap opened, granulomatous tissues removed. Root canal treatment and apically resection applied. Defect area filled with demineralized bone graft and flap primarily closed using double-flap technique. Six weeks after, crown restoration have completed with composite and fiber post. Clinically and radiographically successful results of the treatment have been observed for 5 years with the stability of periodontal soft and hard tissues.

Conclusion: We concluded that in treatment of the teeth with severe endodontic-periodontal combined lesion and mucogingival problem can be treated in the same operation with long-term stable and successful results.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

Introduction: The ovoid pontic design in a fixed dental prosthesis (FDP) has been recommended for gingival contouring and rehabilitation of extraction sockets in the esthetic region besides proper functioning. The convex design of ovoid pontic maintains a concave soft tissue outline. After intraoral and radiographic examination of a 25-year-old male with increased mobility and pain due to trauma in maxillary incisors, intra-oral digital impression was made (Cerec AC Blue Cam, Sirona). The extraction of both maxillary central incisors followed by an immediate provisional FDP with ovoid pontic design were planned after the extraction for socket preservation. After teeth preparation and before surgery, the central incisors were resected from the digital model to perform a concave soft tissue outline in the edentulous ridge mucosa and physiologic stimulus of the soft tissue. Provisional restorations were modelled immediately using a computer-aided design (Cerec 4 software, Sirona) and milled from acrylic blanks (Telio CAD, IvoclarVivadent -Cerec MCXL, Sirona). After glazing, restorations were temporarily luted (TempoCem™NE). Dental floss was checked for free passage between the pontics. After 2 weeks the convexity of the pontics was decreased. A definitive CAD/CAM fabricated (IPS e-max zirCAD, IvoclarVivadent) zirconia FDP was prepared 1 month after placement of the provisional restoration.

Conclusion: After a follow-up period of 6 months, interdental papilla, gingival contour, consistency and esthetic appearance were clinically healthy and the patient had no complaints. Long-term clinical trials may be required for the clinical outcome of ovoid pontic design effect on FDPs.

Introduction: Ceramic veneers are a conservative and minimal invasive treatment approach for esthetic and functional rehabilitation of compromised anterior teeth. This protective treatment can also help in rehabilitation of hypersensitivity of eroded or abraded teeth. CAD/CAM materials and milling techniques also aid in achieving optimized, durable and design-controlled prosthetic restorations.

Case: In this clinical report, an alternative use of ceramic laminate veneers was described for rehabilitation of acid-eroded palatal surfaces of maxillary posterior teeth of a 20-year-old female. Intraoral examination revealed wear facets on the palatinal surfaces of posterior teeth due to a nutrition disorder. CAD-CAM fabricated glass-ceramic veneer restorations were planned for palatinal reconstruction of maxillary posterior teeth without any tooth preparation. Intraoral optical impressions (Cerec AC Blue Cam, Sirona, Germany) of the compromised teeth were made. Veneers were modelled (Cerec 3.8 software) and milled from glass-ceramic blocks (IPS Empress CAD and IPS e.max CAD, Ivoclar, Schaan, Liechtenstein) in the CAM unit (Cerec MCXL, Sirona). Following glazing procedure, restorations were luted with a dual-curing resin cement (Variolink II, Ivoclar). Successful functional and esthetic results were achieved after a follow-up period of 6 months and the patient had no complaints.

Conclusion: Ceramic laminate veneers can be used alternatively for minimal invasive and conservative treatment of severely eroded/abraded palatal tooth surfaces, but long-term randomized controlled clinical trials are necessary for clinical outcome of this alternative ceramic laminate veneer application.

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Introduction: Preservation of bacteria-resisting connective tissue area and biological width around dental implants aid in prevention of bone loss. During the prosthetic stages, the biological width is being disturbed with sequential removal and insertion of the healing cap. In order to prevent this, a zirconia abutment at the time of implant placement followed by provisional crown fabrication through a bimodal clinical approach has been described in this clinical report.

Case: A provisional restoration for the planned extraction of the maxillary right central incisor of a 51-year-old female with increased mobility due to vertical root fracture was fabricated on an obtained cast before extraction and surgery. A standard bone level implant (RC:4.1 mm, 14 mm, Straumann) was placed and after 8 weeks healing period, a prefabricated zirconia abutment was selected and adapted and the non-occluding provisional crown was luted with a composite resin (Adelite All Purpose, Bisco) on the abutment. The patient was recalled after 1 week for control. After 8 weeks, an all-ceramic crown (IPS Empress CAD Multi C14, Ivoclar Vivadent) was prepared using a CAD/CAM system (Inlab, Sirona) and luted with a dual-curing resin cement (Variolink II, Ivoclar Vivadent). The patient was followed-up for 1 year without any complaints.

Conclusion: Preservation of gingival contour through controlled and guided prosthetic rehabilitation healing around single implants at the esthetic region with bimodal approach is a predictable clinical application, however long-term clinical studies are required for the continuum of the gained gingival and periimplantary status.

3D Volumetric Evaluation of Laminate Veneer Preparations

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Objectives: The aim of this study was to evaluate the amount of removed tooth tissue for laminate veneer preparations performed by two dental students and a prosthodontist.

Methods: Laminate veneer preparations were performed at nine maxillary central incisors by two dental students (S1, S2) and a prosthodontist (P) with dimple method using same diamond burs to be in the ideal depth range of 0.4–0.6 mm. All teeth were scanned before and after preparations with 3shape visual system. The removed enamel tissue from incisal, middle and cervical 1/3 parts on buccal surfaces of teeth were measured.

Results: On the incisal third, the preparation depth was 0.35–0.50 mm for P, 0.39–0.85 mm for S1, 0.61–0.79 mm for S2. On the middle third; 0.46–0.33 mm for P, 0.61–0.85 mm for S1, 0.79–0.78 mm for S2. On cervical third P prepared 0.47–0.50 mm, S1; 0.57–0.70 mm, S2; 0.66–0.65 mm. Approximately removed enamel tissue from buccal surface was 0.45 mm for P, 0.61 mm for S1, 0.67 mm for S2. Removed tissue volume was measured to be 21 mm3 for P, 40 mm3 for S1, 44 mm3 for S2. Clinically experienced prosthodontist has removed approximately double less tooth tissue than dental students.

Dental Pulp Reaction to Abutment Teeth Preparation for Fixed Prostheses

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Aim: Our Objective is to evaluate the defense potential of dental pulp in vital abutment teeth during the preparation phase in which many types of pulp aggressions may take place as well as the evaluation of preparation-related pulpitis frequency.

Material: A 14-item questionnaire containing information related to:
- Patients
- oral hygiene
- abutment teeth
- dental prostheses type
- pulp reaction to the preparation procedure

Methods:
- A 2 to 5 weeks follow-up from clinical examination to abutment teeth preparation including control of dental pulp integrity.
- Data collection.
- Coding and input using the SPSS program version 17.0
- Statistical analysis using averages to describe quantitative data and relative frequencies to describe qualitative variables.
- A descriptive study for specificities related to the patients, the periodontal environment, the abutment tooth and to the prosthodontic treatment.
- An analytic study for the different correlations such as:
  - Correlation: crown height and pulp reaction.
  - Correlation: Crown material and pulp reaction.

Results: This study has shown that short teeth presented pulpitis after the preparation in 84% of the cases. The crown material and the situation of finish line compromise pulp integrity: supragingival, paragingival or intrasulcular, the percentages correspond to teeth which had been devitalized.

Conclusion: This clinical study shows effective dental pulp defense mechanism during abutment teeth preparation phase. Pulpitis occurrence frequency was noted. Precautions are needed to prevent iatrogenic pulpitis during the preparation phase. Moreover, respecting procedural recommendations is vital for the preservation of the pulp from potential aggression.
The Effect of Different Surface Treatments on the Flexural Strength of Repaired Acrylic Denture Base Resin

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Objectives: This study investigated the transverse repair strength of a conventional heat-polymerized acrylic resin specimens repaired with auto-polymerizing resin after the repair surfaces were treated with different techniques.

Methods: A total of fifty rectangular specimens (65 x 10 x 3.3 mm) (n = 10) of heat-polymerized acrylic resin (QC 20) which was repaired with auto-polymerizing resin following surface treatments: Group 1 (intact specimens as a control), Group 2 (without surface treatment), Group 3 (wetting with methyl-methacrylate), Group 4 (Er;Cr;YSGG laser application 3 W-20 Hz), Group 5 (Er;Cr;YSGG laser application 4 W-20 Hz). The flexural strength was measured by a three-point bending test using a universal testing machine with a 100 Kgf load cell in the center of repair at 5 mm/min cross-head speed. All data were analyzed using 1-way ANOVA and Tamhane test (p < 0.05).

Results: Group 1 (control) showed (38.65 ± 8.16 MPa) significantly highest flexural strength values than the other groups (p < 0.05). Group 5 (5.78 ± 2.11 MPa) demonstrated significantly lower values than group 2 (13.48 ± 5.87 MPa), Group 3 (24.08 ± 5.55 MPa), and Group 1 (p < 0.05). Group 4 showed higher values (15.05 ± 9.59 MPa) than Group 5, but this difference was not statistically significant (p > 0.05).

Conclusions: Er;Cr;YSGG laser treatment alone was not able to improve the flexural strength of the repaired acrylic resin, but wetting the repair surfaces with methyl-methacrylate may be prefatable method to increase the flexural strength of denture base repairs.

Value of Ultrasonic Computerized Axiography in Clinical Functional Oral Diagnosis

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Aim: The increase in incidence of craniomandibular disorders has stimulated dentists to develop better methods to evaluate, investigate and treat these affections. Cranio-facial disorders have become a problem for many patients who find only a low amount of pain relief in current treatments.

Materials and methods: One hundred and fifty subjects (97 female, 53 male) presented for craniomandibular disorders at the Dental Prosthetics Clinic of the Faculty of Dentistry “Carol Davila”, Bucharest, Romania. Of these, 90 had objective symptomatology and were included in the study (58 women, 65%; 32 men, 35%; age range: 17–37 years). The patients were clinically analyzed according to the “Evaluating occlusal relationships, mandibular dysfunction, and temporomandibular joint pain by palpation” protocol of Bohli C.F. and Knap F.J. The ultrasonographic examination was done using the JMA system with which we measured mouth opening capacity, protusive movements and right and left laterotrusion.

Results: After muscular palpation examining, pain was found at the following sites in our cohort: pterygoideus lateralis muscle (72 patients), temporal muscle (24 patients), pt formerly medialis muscle (18 patients), masseter muscle (12 patients). Thirty-eight patients presented no pain.

The mean mouth opening capacity was 46.8 mm (range: 20.1–61.2 mm). Out of the 90 subjects, 54 presented a normal functioning temporomandibular articulation (36%), 22 had unilateral dysfunction (14.67%) and 14 had bilateral dysfunction (9.33%).

Conclusions: Aside from the clinical examination, computerized ultrasonographic axiography represent a valuable tool for the diagnosis of craniomandibular disorders, allowing for a modern and efficacious treatment.

Anterior Restoration: A Multidisciplinary Challenge

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Introduction: Prosthetics are at the crossroads of dental disciplines. In case of multidisciplinary rehabilitation prosthetics is often crowning and finishing the case.

Restoration of the anterior sector is a fastidious and tricky challenge. Indeed, they should respond to biological, mechanical, functional and aesthetic aims of the treatment. This multiplicity of objectives requires upstream from the therapeutic decision, a variety of information collect (about aesthetic, function, anatomical data) and a multidisciplinary approach.
**Case:** Through clinical cases, we will highlight the contribution of periodontics to ensure integration and improve the prognosis of anterior prosthetic restorations.

**P516**

**Effect of Different Surface Treatment on Bond-Strength of Denture Base**

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**Aim:** Prosthodontists may concentrate on the implantation and make a removable connection with the implants simply by fitting the female parts to the removable denture. The study was designed to evaluate the effect of different surface treatment on bond strength between denture base and two different locator abutment luting acrylics.

**Materials and methods:** A heat-polymerized denture base resin (Paladent; Heraus Kulzer), and two different locator abutment luting auto-polymerized acrylics (Ufi Gel; Voco, Quick Up, Voco) were used. A total of 80 specimens were prepared from the denture base resin according to manufacturer instructions, and divided into eight groups of 10. Then applied with six combinations of three different surface preparation method (Ethyl acetate, Methylene chloride, Er-YAG Laser) and two locator abutment luting agents; two groups were also bonded with two luting acrylics without surface treatment as control. After 24 h of storage at 37°C, the shear bond strength (MPa) of the specimens was measured in a universal testing machine. Kruskal Wallis analysis of variance and the Mann Whitney U tests were performed for the statistical analysis.

**Results:** Ethyl acetate application increased the bond strength between the denture base and locator abutment luting acrylic significantly (p < 0.05). No significant differences were detected between methylene chloride and laser treatment, compared to controls (p > 0.05).

**Conclusion:** The study revealed that surface chemical treatment with ethyl acetate improved the bond strength. The Ufi Gel with ethyl acetate surface treatment is recommended as the combination possessing the most bond strength among the other combinations.

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**Effect of Nano-Silver Acrylic Resin Against Adhesion of Candida Albicans**

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**Aim:** The study was to compare mean of colony forming unit (CFU) of Candida albicans that adhere on nano-silver acrylic resin.

**Methods and materials:** By mixing nano-silver particle to polymer part of heat cured acrylic resin, whose incorporating dose were 0 (control), 250, 500, 750, 1000, 2500 and 5000 ppm, respectively, 10 samples per group size of 15 x 10 x 2 mm3 were made. The yeasts were grown on Sabouraud broth at 37°C 180 rpm for 6 h. After that, the samples were added in test tube and continuously incubated in shaking incubator for 12 h. The grossly adherent cells of Candida albicans was removed by vibrating in sterile distilled water for 20 s. Then add the sample into test tube with new Sabouraud broth and continuously incubated in shaking incubator for 18 h. These Sabouraud broth samples were diluted and incubated in Sabouraud agar at 37°C for 18 h. The colonies were counted and statistic analysis was performed by One way ANOVA at significant level = 0.05.

**Results:** The result show that mean of colony forming unit (CFU) of nano silver acrylic resin in control group were different significantly from 250, 1000 and 2500 ppm (p-value = 0.007 p-value = 0.030 p-value = 0.022 respectively.).

**Conclusion:** Even though the nano-silver act as bactericide, to mixed with acrylic resin, the concentration have to be adjusted for the suitable out come.

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**Effect of Fiber Laser on Surface Roughness of Zirconia**

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**Purpose:** The purpose of this study was to investigate the surface roughness of zirconia after fiber laser application.

**Material and methods:** Five sintered zirconia discs were used. Different power and frequency of fiber laser applied to each of zirconia discs surface.

1 sample: 60 watt/40 khz
2 sample: 100 watt/80 khz
3 sample: 75 watt/80 khz
4 sample: 100 watt/20 khz
5 sample: as control

Surface roughness of the specimens of zirconia were evaluated with scanning electron microscope (SEM) analyse.

**Results:** Surface roughness of all samples which applied fiber laser were different than control sample. Also cracks were seen in some samples. The SEM analyse view of the sample 4 was different from all samples. On the surface of sample 4, the formation of clear pits and formation of microretentive grooves were seen.

**P519**

**Influence of Pressing and Layering Technique on Color of Zirconia**

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Objectives: Color matching between zirconia restoration and natural teeth is a common clinical problem. The purpose of this study was to evaluate the effects of two different application methods of veneering ceramic and liner material on the color stability of a zirconia based all ceramic system.

Methods: Forty ceramic specimens (15 × 12 × 2 mm3) were fabricated from a zirconia-based porcelain (IPS e-max ZirCAD) using an Isomet low-speed saw. The specimens were randomly divided into four groups (n = 10). Group LT, zirconia specimens were investigated with additional veneering ceramic (IPS e.max Ceram) using layering technique. Group LTL, additionally the group LT was applied to the liner material (IPS e.max ZirLiner). Group PT was designed for investigation the influence of a ceramic veneering, which was applied in pressable technique. Group PTL, additionally the group PT was applied to the liner material. Baseline and after 48 h storage in the coffee solution, color measurements of specimens were made with a colorimeter, and color differences (∆E) were calculated. The data were analyzed with a 2-way ANOVA followed by Tukey HSD tests (p = 0.05).

Results: There were significant differences between the color difference values of all groups (p < 0.05). Group LT showed the highest ∆E values (2.66 ± 0.41), and the lowest ∆E values were recorded for PTL group (0.8 ± 0.29) (p < 0.05).

Conclusions: The color of a zirconia based all ceramic system is influenced by layering and pressing methods and liner material.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

P520

CAD/CAM Solution for Inclined Dental Implants
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Introduction: Excessive angulations of dental implants are one of the most challenging problems for the prosthodontists. Although dental implant manufacturers fabricate angulated abutments, it can be used to compensate the inclination up to 20°. Custom abutment fabrication remains to be the only solution to restore the inclined implants when patients are unwilling to deal with further surgical procedures. Custom abutments can be prepared either by casting, or by using CAD/CAM techniques.

Case: In this case report prosthetic rehabilitation of 57 years old female patient using CAD/CAM designed custom abutments is presented.

P521

Effect of Multiple Firings on Bond Strenght of Zirconia-Porcelain
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Objectives: Zirconia ceramics are coated with veneering ceramic to improve the aesthetics. During the veneering process material is fired usually three times. Firing cycles increase with clinical adaptation and integrity problems. The aim of this study was to evaluate the effect of multiple firings on shear bond strenght of between zirconia core and veneering ceramic.

Methods: Fifty ceramic blocks specimens (15 × 12 × 2 mm3) were cut from yttria-stabilized zirconia blocks and sintered. These specimens were veneered with 3 mm thick and 5 mm diameter IPS e.max Ceram porcelain. Specimens were divided into five groups and subgroups were fired 1, 3, 5, 7 and 10 times respectively according to manufacturer instructions of veneer ceramics which are advised by the manufacturer of zirconia core systems. Shear bond strength was performed with a testing machine at a cross head speed of 0.5 mm/min. Data were statistically analyzed using ANOVA (p = 0.05).

Results: Shear bond strength and SD (Mpa) for five groups were 13.97 ± 3.36; 16.25 ± 2.13; 14.86 ± 3.72; 14.03 ± 3.99; 13.4 ± 4.65 respectively. The second group had the highest bond strength and the fifth group had the lowest bond strength. There was no significant difference between the bond strengths of each of the five groups (p = 0.466).

Conclusions: The heat treatment associated with the veneering procedure on a zirconia core material study did not significantly affect shear bond strength.

P522

Treatment of Unilateral Cleft Lip and Palate: Case Report
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Introduction: Cleft lip and palate are the most common congenital anomalies which causes aesthetic and functional problems. Most common difficulties are insufficient alveolar bone quality and quantity, inadequate soft tissue, and poor abutment teeth. Although cleft lip and palate patients could be reconstructed with conventional prosthesis or implant retained prosthesis, clinicians still face some difficulties in prosthetic reconstruction.

Case: In this clinical report a treatment plan of 22-years-old patient with unilateral cleft lip and palate who complained about both unaesthetic appearance by reason of tooth loss on the anterior segment of maxilla because of alveolar segments’ fusion problems and functional deficieny depending on the lack of anterior teeth and occlusal dysfunction were explained. A detailed medical and dental anamnesis was obtained. Due to structure loss in the cleft area standard fixed dental prosthesis were contraindicated by the esthetic reasons and clean ability problems. Therefore prepara-tion of the maxillary teeth for 14 unit fixed metal – ceramic prosthesis with a special bar attachment in the anterior part for removable partial prosthesis was planned. Intraoral adjustments were done and glazed metal – ceramic restoration was luted with resin cement.

Conclusions: The treatment has provided compensation of structure loss and support the soft tissue so the treatment successfully met the patient’s esthetical and functional expectations.
P523
Comparison of Marginal Fit of Three-Unit FPDs Fabricated with Four Different Casting Techniques
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Objectives: The aim of this study is to evaluate and compare the marginal fit of three-unit FDPs using four fabrication techniques, and to conclude in which area the largest misfit is present.

Methods: Firstly a stainless steel master model was produced. The first impression was made with additional silicone, and master and working models were then produced. A total of 40 three-unit FDPs were fabricated with four different production techniques: conventional casting method (CC), milled metal fabricated with CAD/CAM (MM), induction casting Co-Cr (IC), and direct laser metal sintering (LS). Each of the four groups consisted of three-unit ten FDPs. Fit of the marginal gaps was measured in a stereomicroscope, digital photos were taken at 56x magnification and then analyzed using measurement software. Statistical analyses were performed with one-way ANOVA and Tukey’s test.

Results: Best results were recorded for LS groups. This group was followed by MM, IC and CC groups in order. Significant differences were present between CC and LS (p < 0.05). The regression analyses presented differences within the parameters: production technique, tooth size, position and measurement point (p < 0.05).

Conclusion: Best fit was found in the LS group followed by MM, IC and CC. In all four groups, best marginal fit in both abutments was buccal and lingual side in the deepest part of the chamfer preparation. The greatest misfit was present at contact region in all specimens.

P524
Implant-Supported Bar Overdentures Using CAD/CAM Technology and 3-D Design Software: Case Series
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Introduction: Several techniques have been described for the successful restoration of the edentulous ridges; local anatomic conditions and patient-related factors determine the choice of treatment modality. One alternative is the implant-retained bar overdenture which is reported to be the appropriate treatment choice for patients with inadequate bone volume in the posterior maxilla and mandible. The frameworks are conventionally fabricated with the lost wax-casting technique, cast-on abutment technique, computer numerical control milling or laser sintering. Recently computer-aided design/computer-aided manufacturing (CAD/CAM) technology is being used in fabrication of the frameworks and it offers the benefits of high rigidity and precise fit to the superstructure.

Case: This report describes the fabrication of maxillary and mandibular implant-supported milled titanium bars and overdentures of three patients.

P525
Treatment of Different Prosthetic Indications with CAD/CAM
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Objective: Computer-aided design (CAD) and computer-aided manufacturing (CAM) have become an increasingly popular part of dentistry over the past 25 years. The technology, which is used in both the dental laboratory and the dental office, can be applied for many kind of restorations. In this study patients with different prosthetic indications which treated by using CAD/CAM Cerec4.0 system, will be presented.

Methods: The first patient conducted to our clinic with a big filling. After cavity preparation, molar tooth with only two walls remaining was vital. Its treatment was planned by using an modified onlay restoration. The second case was a inlay restoration in left maxillary premolar. The third patient had a big class five cavity in his canin tooth. The tooth was filled for many times before. Cavity preparations of the patients’ was done and digital impressions were taken with intraoral camera (Omnicam; Sirona). Restorations designed digitally with Cerec4.0 system. Final restorations were prepared using milling machine. So the feldspathic full ceramic restorations cemented with dual-cure resin cements.

Results: After these treatments, the restorations resulted with a high biocompatibility and aesthetic satisfaction.

Conclusion: CAD/CAM technology has achieved clinical success in marginal adaptation and aesthetic.

P526
Prosthetic Reconstruction of Cleft Lip and Palate Patient
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Introduction: Although patients with cleft lip and palate (CLP) are not seen regularly in general dental practice, this is a frequent congenital anomaly. The cause of CLP is unknown, but possible causes are malnutrition and irradiation during pregnancy, psychological stress, teratogenic agents, infectious agents (virus), and inheritance. Most clefts are likely caused by multiple genetic and nongenetic factors. Prosthetic reconstruction of the anterior maxilla is important for these patients. Edentulous cleft palate patients present with restorative difficulties due to their compromised maxillary arches as well as the presence of scar tissue in their palates and lip.

Case: This paper describes the prosthetic rehabilitation of a 41 years old male patient who has applied to Istanbul University Faculty of Dentistry Department of Prosthodontics, with CLP, surgically treated CLP when he was 12.

After surgery, palatal defect was reconstructed but the scar tissue was still extant and his maxillary lateral incisor was missing. Other teeth were missed by reason of carries and periodontal disease. In oral examination also decreased vertical dimension was noticed. Vertical dimension of occlusion was increased by temporary crowns.
and neither TMD nor masticatory muscle pain was recorded during routine controls made 3 months time. The treatment was finished with fixed prosthesis, supported by teeth and implants.

P527
Determination of Skeletal Class in Total Edentoulism
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Aim and Purpose: Our aim is to determine the skeletal class in total edentoulism during denture fabrication, by using the Steiner analysis.

Materials and methods: For this purpose we made lateral craneograms of 60 subjects, 30 from each sex.

During the analyze we used basic reference points: S; N; A and B; the SN-plane and angles: SNA and SNB, which are formed between these previously mentioned points. These reference points are used for the skeletal relation determination. From their particular values we discover the relation between the jaws and the cranial base. In the Steiner analysis, the accent is placed on the difference between SNA and SNB angles, i.e. the angle ANB. If the difference is between 2° – 4°, we have I skeletal class; if the difference is larger than 4°, we have II class or distal occlusion; and if we have angle smaller than 2°, we have III class or mesial occlusion.

Results: From the analysed shots of 30 male respondents, 21 of them were classified in I class, 4 of them were classified in II class and 5 of them were classified in III class. Thirty female subjects exhibited following results: 24 were classified in class I, 3 were classified in II class and another 3 were classified in III class.

Conclusions: Using this analyse, beside of determining the skeletal class, we can make a correct treatment planning of total edentoulism by placing the tooth in the right place on the denture, based on malocclusion type.

P528
Long-Term Clinical Results with Immediate Dentures
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Objectives: The aim of this study includes a retrospective clinical evaluation of placement different immediate dentures (ID), in the prosthetic rehabilitation.

Materials and methods: Through the cases we will show you our standing point and results acquired with adequate correction with partial and total immediate dentures, in prosthetic treatment of 48 patients, were installed between 2005 and 2011, 40 in the upper jaw and 8 in the lower jaw.

This lecture will present clinical evaluation included clinical protocols associated with each type, laboratory protocols and post-insertion care.

Results: Our results show that the most suitable approach for prosthetic rehabilitation in one visit is placement of immediate dentures. Satisfaction of the non changed appearance of our patients treated with ID shows that there are advantages of this method compared to the method of the teeth extraction, time needed for stabilization and resorption of the alveolar bone processus.

Conclusions: Immediate dentures can be successfully used in cases where tooth extraction is indicate. For archiving maximal aesthetics, preventive and functional results, protocol for ID should be made individually for each patient.

P529
Neurophysiological Resistance of the Carriers in Alternative Dental Bridges
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Aim: The goal of the study is to show the neurophysiological resistance of the carriers in alternative dental bridges, to determine the amount of pressure on the carrier, more precisely how much mastication pressure can he withstand when it is directly on him, and how much he can withstand when it is on the pontic.

Methods and materials: We used 200 patients from our ongoing clinical work, with cantilever dental bridges. We did the measuring, by measuring the mastication pressure using an electric gnathodynametar, individually constructed, in a time frame of around 6 months after the permanent cementing of the dental bridges.

Results: The results showed a resistance of the carriers of 125N, and of the pontics of 85N (given as an average of all observed cases).

Conclusion: We came to the conclusion that whenever there is an indication for a cantilever dental bridge (most commonly when there is a lateral incisor missing, and there are no conditions for an implant) or shortened dental arches, when crafting a distal pontic, an alternative solution is justified in terms of functionality and reasonable durability.
Different Impression Techniques: A Case Report

Comparison of Complete Dentures Constructed With Two Impression Techniques: A Case Report

Purpose: The purpose of this study was to survey members of Turkish Dental Association to evaluate current impression materials and methods for denture prosthodontics in Istanbul, Turkey.

Materials and methods: An anonymous questionnaire was mailed to all 400 active TDA members in the Turkey in 2013. Data analysis was performed via frequency distribution and chi square statistics.

Results: Two hundred and eighty-five questionnaires were returned by members of the TDA (71.25% return rate). The majority of the reporting dentist use a border-molded custom tray for final impressions for complete denture prosthodontics. The most popular material for border molding was plastic modeling compound (70.17%). Variability of the materials used for final impressions was observed, with the most popular materials being condensation silicone (52.68%) for fixed dentures and Zinc oxide eugenol (61.78%) for complete dentures. Dual Phase Putty/Wash impression technique (73.26%) for fixed dentures is popular among other techniques. Statistically significant differences were found in the materials used for border molding by dentist (p < 0.05).

Conclusion: There was variability of the materials and techniques used for final impressions by TDA members, however, overall there was an agreement on the materials and techniques used by dentist. Using condensation silicone impression materials for fixed dentures and zinc oxide eugenol impression materials for complete dentures were observed in TDA members in Turkey.

Comparison of Complete Dentures Constructed With Two Different Impression Techniques: A Case Report

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Purpose: The aim of this case report was to compare the functional usage of complete dentures that were fabricated by using both conventional and neutral zone impression techniques.

Case: A 73-year-old female patient was referred to the Department of Prosthodontics with the complaint of functional disability of her mandibular complete denture. In clinical examination, the misfit of mandibular denture, phonetic problems due to the maxillary denture and vertical dimension loss was determined. There was an advanced mandibular ridge resorption and it was decided to construct two different complete dentures for the patient with different impression techniques. One of the dentures was prepared according to neutral zone impression technique and the other was produced with conventional techniques. Patient firstly used the neutral zone denture for 8 weeks. Eight weeks later, the conventional dentures were replaced with neutral zone dentures. Two weeks later the patient referred to the clinic with major complaints and stated that the neutral zone dentures were more comfortable.

Conclusion: The neutral zone technique is an alternative approach for the construction of complete dentures for advance resorption of the ridges. The technique aims to construct a denture that is shaped by muscle function and surrounding oral structures. This technique may provide a more stable and retentive complete dentures for patients that have highly atrophic ridges.

Treatment of Dental Asymmetry in a TMD Patient

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Case: A 30 year old female patient has applied to Istanbul University Faculty of Dentistry Department of Prosthodontics for her Tmj pain and dental esthetic problems. Her severe visits to other dentists and esthetic surgeons, because of mandibular deviation, asymmetry in the dental arch, correspondingly her esthetic complaints she has told to have orthognatic surgery to resolve the problem.

In intra and extra oral examination for TMD also decreased vertical dimension of occlusion has noticed. Research Diagnostic Criteria for Temporomandibular Disorders form was filled. For increasing the vertical dimension of occlusion and treatment of TMD a centric relation splint was fabricated and the patient has used it for 3 months. After 3 months no symptoms was recorded for TMD.

The treatment of asymmetry was planned by starting periodontal surgery procedures. Crown lengthening was made for right maxillary region. After routine controls and gum healing metal fused to porcelain crowns was decided depending on the patient’s choice.

Conclusion: Asymmetry problem was solved with fixed prosthodontics and the treatment was finished by receiving the approval of the patient. Routine controls for each 6 months was suggested.

The Comparison of the Precision of Different Dental Radiographic Methods in Mandibular Periimplantary Measurements: An In Vitro Pilot Study

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Purpose: The aim of this in vitro study was to investigate and compare the precision of several radiodiagnostic methods used in dentistry for the measurement of periimplantary sites.

Materials and methods: Six dental implants were placed in a human cadaver mandible. Periapical radiographs obtained with the parallel as well as the bisecting angle technique, digital and conventional panoramic radiographs were used for implant and periimplant bone measurements. The measurement results at each implant were statistically analyzed.

Results: The ICC values for the inter-observer reliability were 0.79 for implant diameters and 0.96 for implant lengths. Statistical significance was not detected between the differences of the measurements of the two examiners from the original implant dimensions related to anatomic locations. For both of the examiner measurements, significantly less difference from the original implant dimensions was detected in the parallel technique compared to the other techniques (p < 0.05).
Conclusions: The present study showed that the most precise peri-
implant bone measurements can be obtained from periodical radi-
ographies obtained by the parallel technique.

P534
Evaluating the Effects of Different Surface Treatments
and Different Resin Luting Agents in the Zirconia Post System
which Produced by CAD/CAM for Retention
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Aim: This study investigated the effect of surface treatments of the
retentive strength of zirconia posts which had been produced by
Computed Aided Design/Computer Aided Manufacturing (CAD/
CAM) technique to root canals.

Methods and materials: Maxillary central incisors (n = 120) were
obtained and assigned randomly to 12 groups (n = 10 per group).

- Three different type of surface roughness.
  1. Hydrofloric acid,
  2. Al2O3 partial abrasion,
  3. CoJet silica coating system (and 3 control groups) were applied
to the posts surfaces and the posts were cemented adhe-
sively with 3 different adhesive luting
  a. MDP contain cement,
  b. Bis-GMA Based Resin,
  c. Adhesive Resin Based cements
To the prepared sample, at the Instron Testing Machine by the
help of appropriate equipment the tensile tests evaluated.

Results: All treatment methods increased the tensile strength of zir-
conia posts compared to the control group (p < 0.005). In the sur-
ficial treatment techniques Al2O3 partial abrasion (129.17N) and
CoJet silica coating technique (108.03 N) were finding effective
and in the adhesive cement, which is contain MDP was finding
most effective (p < 0.005).

P535
Missing Anterior Tooth Rehabilitation by Porcelain Fixed Denture
in Adolescence
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Introduction: The lost of anterior tooth can be depressing to the
patient both psychologica and socially in adolescenet patients.
Temporary replacement of the tooth can minimize these concerns.
Many approaches have been described for this temporary replace-
ment. This article presents an alternative approach for oral rehabi-
lation of the pre adolescent female who has lost anterior central
tooth in early age.

Case: 12 years old girl applied to clinic with missing central tooth
on maxilla. She was unhappy due to her appearance. She was
young for implant or fixed porcelain dentures. And patient did not
want to use a removable partial denture. In her anamnesis she lost
her tooth after traumva. We planned a temporary metal reinforced
porcelain denture including pontic and only supports from neigh-
bour teeth’s singulums. We cemented denture. As a result she was
happy with her new appearance.

P536
Evaluating the Compressive-Shear Bond Strength of Different
Surface Roughness of Zirconia Post System that has Luted with
Different Luting Agents
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Aim: His study was going to examined as the effect of resistance
and fracture types of zirconia posts that have three different typed
of surface roughness and then which were luted with three differ-
ent adhesive luting cements.

Methods and materials: Maxillary central incisors (n = 120) were
obtained and assigned randomly to 12 groups (n = 10 per group).
The post spaces were prepared into the root canals and 120
directly fabricated acrylic resin posts and core patterns were
obtained. The 120 resin post and core core patterns were trans-
ferred to a dental laboratory to be duplicated to zirconia post and
core foundations with the use of CAD-CAM technique. Obtained
zirconia post and core specimens were assigned to 12 experimen-
tal groups (three control groups) (n = 10).

- Three different surface treatments methods
  1. Hydrofloric acid etching,
  2. Al2O3 partial abrasion,
  3. CoJet silica coating system were used to make surface rough-
ness of the posts.
  
  And then posts were luted with the use of three adhesive luting
agents
  a. MDP contain cement,
  b. Bis-GMA Based Resin,
  c. Adhesive Resin Based cements.

To the prepared sample, at the Instron Testing Machine by the
help of appropriate equipment the compressive-shear tests evalu-
ated. The results were examined with ANOVA and also with
Tukey HSD and Dunnnett t tests (p < 0.005).

Results: There were no significally differences were found for the
compressive-shear strength (p < 0.005). And also the fracture
types were examined mechanically and with ARI and BRI index.
The fracture type were classified into the four types. The most
seen fracture types were the 1/3 cervikal third vertically fracture
types.
P537
The Effect of Different Sprue Designs on the Internal Porosity of Cast Titanium Crowns
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Statement of Problem: Porosity is a frequently observed casting defect in titanium dental casting.
Purpose: This study measured the effects of different sprue design on the internal porosity of cast titanium alloy crowns.
Methods and materials: Sixty complete veneer crowns were fabricated on a stainless steel die with a 150°–degree sloping shoulder using customized wax patterns.

All wax patterns were sprued with three different sprue designs (Reservoir, Runner bar and Rousseau) and were invested with an alumina – magnesia investment. Castings were made with commercially pure titanium [cp Ti (grade II)] according to the manufacturer’s instructions. The castings were carefully cleaned.

Internal porosities were quantified with photographs and radiographs by computerized image analyses. Data were analyzed with an ANOVA with a confidence level of 95%.
Results: There were statistically significant differences in the values of porosity between 3 types of sprue designs. The Reservoir sprue design had the least internal porosity comparing to the other designs.
Conclusions: Improvements in the porosity of titanium crowns was the result of the Reservoir sprue design with vent. Effects of different sprue designs on internal porosity and their effects on casting accuracy and marginal adaptation of cast titanium crown and bridges must be evaluated to achieve better evidence and clinical relevance.

Key words: Titanium, Sprue design, internal porosity.

P538
Dental Implant-Retained Mandibular Overdenture in A Child With Ectodermal Dysplasia
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Introduction: Ectodermal dysplasias are relatively rare and are characterized by the abnormal development of embryonic ectoderm derivatives such as hair, nails, teeth, and skin. The objective of this case report was to present the prosthetic rehabilitation of a 6-years old growing child with hypohidrotic ectodermal dysplasia after placement of two mini endosseous implants in anterior mandible and to introduce clinical effectiveness of this prosthetic procedures after 4-years follow up.

Case: A 6-years old boy with ectodermal dysplasia have maxillary oligodontia and mandibular anodontia with undevelopment of alveolar processes. The treatment option considered for this child included constructing implant retained removable denture in mandible and removable partial denture in maxilla supported by first molars. Evaluation of post-treatment cephalograms revealed facial growth during the 15-months period and the same prosthetic procedures have been renewed for two times in the following 4 years. Satisfying functional and esthetic results have been achieved and no problem has been detected related with mini implants and growth pattern within the 4 years follow-up period.

Conclusion: The placement of implants in anterior mandibula region also seems to be a promising approach. Because of less vertical bone growth in this region, implant placement does not adversely effect the transverse mandibular growth. The placement of implants facilitated patient to accept and handle with the removable denture easily. Treatment option in this patient is considered to be a proper method and this further motivates the child patient psychologically during the growing period because of satisfying function and esthetic.

Theme: General Dentistry and Oral Health

P539
Objective Understanding of Emotional Changes Induced by Viewing Dental Treatments
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Aim: Since the understanding of emotional changes induced by dental treatments is important for dentists to provide a safe and comfortable dental treatment, we analyzed electroencephalogram (EEG), electrocardiogram (ECG) and facial electromyogram (EMG) during watching video images of dental treatments to search for the best objective indices reflecting emotional changes.

Materials and methods: Fourteen healthy subjects (six males and eight females) with the mean age of 22.6 ± 3.2 (SD) years voluntarily participated in the present study. EEG, ECG and EMG of the corrugator muscle was recorded during watching video images of intra-oral examination, infiltration anesthesia and cavity excavation. By analyzing EEG and ECG, the emotional changes and autonomic nervous activities were estimated, respectively. The subjective discomfort level was acquired by Visual Analog Scale method. This study was approved by the Ethics Committee of our university.
Results: Analysis of EEG and ECG demonstrated that watching the image of infiltration anesthesia and cavity excavation induced a lowering of relaxation level and an increase in sympathetic nervous activity which elevates with mental stress. The peak activity of corrugator muscle was increased by watching all examined images. The subjective discomfort level was highest during watching infiltration anesthesia image.

Conclusion: These results suggest that subjective discomfort can be seized to some extent by analyzing EEG, ECG and EMG, but the close relationship between subjective feelings and these indices has not been obtained yet. Further investigation is required to find the
most suitable index to understand the emotional states of patients during dental treatments.

**P540**

**Salivary Histatin Levels and Fungal Colonisation in Down Syndrome**

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**Aim:** Histatin 5 is a small molecular weight salivary protein that has been shown to possess antifungal activity against *C. albicans*. We investigated the relationship between concentrations of salivary histatin 5 and the oral fungal colonization in the twelve young individuals with Down syndrome (DS) (mean of age 8.4 ± 0.5) and age- and gender-matched healthy controls (HC).

**Materials and methods:** Whole saliva samples were used to determine the concentrations of histatin 5 by the Human histatin 5 enzyme-linked immunosorbent assay kit®. Microbiological samples were collected from the dorsal surface of the tongue, and cultured on CHROMagar® medium and blood medium to evaluate the carriage of species of Candida and oral bacteria, respectively.

**Results:** Sixty seven percent of DS and 17% of HC had positive fungal culture and the species of *C. albicans* were only found in both of them. The mean number of both *C. albicans* and total oral bacteria in DS also significant higher compared to the HC. Mean of histatin 5 levels were significantly lower (523.72 ± 338.43 ng/ml) for the DS compared to HC (1017.01 ± 492.31 ng/ml; p < 0.01).

**Conclusions:** The data from this study suggested that the level of the colonization of *C. albicans* was significantly higher in DS individuals, whereas the concentration of histatin 5 was significantly lower. From these results, it would be likely contributing to the enhanced predisposition of DS of oral candidiasis due to reducing histatin 5 such as salivary antifungal protein.

**P541**

**Orofacial Features of Treacher Collins Syndrome**

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**Introduction:** Treacher Collins Syndrome is a rare autosomal dominant disorder of craniofacial development. Major features include mid face hypoplasia, micrognathia, microtia, conductive hearing loss and cleft palate. The present case report describe a 6 years old male with TCS with several extra and intraoral findings such as: mid face hypoplasia, zygomatic bone hypoplasia, anti mongoloid slant of palpebral fissures, mandibular rethrognathia and mandibular disostosis, conductive hearing loss, high incidence of caries, lips incontinence, oral breath and speech difficulty.

**Methods and Materials:** Management strategies and behavioral approaches of patients with TCS from dental perspective will be discussed.

**P542**

**Intraoral Radiographic Errors on Photostimulable Phosphor Plates (PSP) Taken by Dental Students**

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**Objective:** The objective of this study was to assess the technical errors of intraoral radiographs on photostimulable phosphor plates (PSP) taken by dental students who were introduced dental radiology practise for the first time.

**Methods:** One hundred and seven dental students attending preclinical radiology training with a mandatory 3 h per week teorical lectures and practical radiology training before clinical practise, were asked to perform six periapical radiographies (maxillary/mandibular molars, premolars, incisors) with the bisecting angle projection technique using PSP (Soredex, DIGORA Optime). All of the images were exposed on the same X-ray training model with finger fixed to phantom head (Morita P27-XR.2 + AM-90D) by dental radiography device (New Life Radiology SRL, Italy) with the same imaging parameters (70 kV, 8 mA). Six hundred and forty-two intraoral radiographies were evaluated by three observers for technical errors including; missing the apices/crowns of teeth, cone-cut, overlapping of contact points, foreshortening, elongation, reversed image, double image, wrong placement of radiograph. The percentages of errors were calculated.

**Results:** The most frequent error seen in this study was elongation (%29). Respectively the others were; missing apices of teeth (%25.3), overlapping of contact points (%20), missing crowns of teeth (%16.9), cone-cut (%12.3), foreshortening (%3.8), wrong placement of film (%2.49), reversed image (%0.4), double image (%0.2).

**Conclusions:** Our results show that students had difficulties in placing the film and adjusting the angulation of tube head so practical training time should be satisfactory for students to learn how to take accurate radiographs. Formal curriculum should be revised to prevent these errors and improve our teaching skills.

**P543**

**Oral Health and Menopause: Investigation on Salivary Secretion and Components**

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Aim: The purpose of this study is to clarify whether salivary secretion and components are influenced by menopausal state, since it is generally recognized that women in menopause tend to suffer from oral health problems such as xerostomia.

Materials and methods: One hundred and eleven female dental hygienists aged 40–59 years voluntarily participated in this study and the unstimulated saliva and blood was collected from them. Fourteen subjects with hysterectomy and diseases such as hyper-piesia and diabetes were excluded from the analysis. The subjects were divided into three groups of pre-menopause, menopause and post-menopause, based on menstrual states. Salivary secretion rate and concentrations of several salivary components and serum estradiol were measured, and those relationships with menopausal states were analyzed. This study was approved by the Ethical Committee of our universities.

Results: The serum estradiol concentration of pre-menopausal group was significantly higher than the other groups. The salivary secretion rate was higher in pre-menopausal group compared with post-menopausal group and correlated with serum estradiol concentration. No differences between three groups were observed in the components of saliva such as antioxidant and secretory IgA. The salivary amylase activity which is regarded to elevate with internal stress tended to negatively correlate with estradiol concentration.

Conclusions: These results suggest that decrease of serum estradiol may result in decrease in salivary flow which may in turn cause problems of oral health at menopause. Furthermore, the tendency of negative correlation between estradiol and salivary amylase levels suggests the association between estradiol level and internal stress.

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Dental Health Attitudes and Behaviour of Dental Students
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Aim: To compare the oral health behaviour and attitudes among the preclinical and the clinical dental students in Marmara University.

Materials and methods: Five hundred and thirty-eight dental students were surveyed by using a Turkish version of Hiroshima University-Dental Behavioural Inventory (HU-DBI). The study design was approved by the Faculty of Medicine, Istanbul University (14102009-03).

Results: The mean HU-DBI score of all students was $6.37 \pm 1.81$ while the mean HU-DBI score of the clinical students ($7.19 \pm 1.54$) was significantly higher than the preclinical students ($5.32 \pm 1.59$) ($p = 0.000$). The percentage of the preclinical students who have used a dye to see how clean their teeth are, who brush each of their teeth carefully and who thinks that they can clean their teeth without toothpaste was significantly lower than the clinical students ($p < 0.001$). Significantly higher ($p < 0.05$) percentage of the preclinical students, compared to the clinical students, use a hard bristles toothbrush, brush with strong strokes, worry about bad breath and colour of their teeth and gums, put off going to dentist until they have a toothache; agree on that their gums tend to bleed while brushing; think that their teeth are getting worse despite daily brushing, tooth brushing alone don’t prevent gum disease, and they can not help having false teeth when they are old.

Conclusions: The oral health attitudes and behavior of dental students improved with the increasing level of education. Preventive dentistry courses should be taught in the beginning of the dental curriculum of the preclinical years.

P545
Oral Health Conditions of Brazilian Schoolchildren
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The epidemiological survey of oral health found by SB Brazil 2010 pointed to a reduction in DMFT 2.8 (2003) to 2.1 (2010), at 12 years of age.

Objective: To determine the oral health status of schoolchildren, aged 7–12 years, in Bahia, Brazil, in order to identify carriers of sickle cell anemia.

Methods: Cross-sectional, descriptive and comparative analytical approved by the Ethics Committee of the Maternity Climério de Oliveira, UFBA, No. 111/09. The sample consisted of 350 children of both sexes. Were added to the instruments used for oral health epidemiological investigations recommended by WHO (1997) examination of Hb electrophoresis to detect sickle cell anemia and quality assessment tests to salivate.

Results: 72.5% of the sample had mixed dentition and 56.3% had caries experience. The dmft and DMFT were 1.45 and 0.53, respectively, and 38.3% children had white spots on dental units and of these 38.3% were of fluorosis. 58.95% had normal salivary flow. The DAI showed 77.2% children with malocclusion. 84.3% have already made a visit to the dentist and 75.7% reported brushing their teeth twice or more a day. We did not identify any children with sickle cell anemia.

Conclusion: Conclusion: The oral health of schoolchildren showed an acceptable standard, indicating the need for orthodontic intervention and there were no children with sickle cell anemia in the sample suggesting the investigation of infant mortality, being a city with a predominantly black population.
kept out of the study. Data were statistically analyzed by Pearson’s Chi-Square tests.

**Results:** Of 258 patients responded, 134 was female and 124 was male. The average age of the patients was 32.8. 13.2% of the patients was graduated from primary school, 14.3% secondary school, 33.3% high school, 43.3% open university, 31.8% university, 3.1% post graduate. Correlation between oral health behavior and different age groups, gender, education was studied. There was significantly difference between variant age groups and to worry about wearing dentures in old age, to be taught toothbrushing, to clean teeth well without toothpaste, to be told that they had brushed their teeth very well by a dentist (p 0.05). There was significantly difference between gender and to worry about visiting the dentist, to get worse of teeth despite daily brushing, to brush each teeth carefully (p 0.05). There was significantly difference between educational level and to brush each teeth carefully, to be taught toothbrushing, to use a dye to see how clean the teeth are, to brush before going to bed, to take medicine before visiting dentist, to floss teeth (p 0.05).

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**Endocrown: A Clinical Case**

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**Objective:** The goal of this work is to use an alternative to full-coverage crowns with a root canal anchorage, making it possible to have a good aesthetic and functional results while preserving the biomechanical integrity of the posterior teeth keeping an excellent retention.

**Clinical case presentation:** A 23-year-old patient presented to the fixed prosthodontics department requesting a crown restoration of the first mandibular molar.

Intra-oral examination revealed an unesthetic and voluminous occlusal amalgam. The molar was devitalized. The endodontic treatment was satisfactory. After removal of the amalgam, a gross intracoronal cavity with supra-gingival walls was disclosed.

The prosthetic decision was to design a ceramic endocrown using CAD/CAM.

**Conclusion:** The endocrowns can be regarded as an alternative to the full-coverage crowns for the restoration of the endodontically treated posterior teeth mainly those with insufficient coronary height and with sufficient tissue available to allow a stable and durable bonding.

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**Central Odontogenic Fibroma – Case report**

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**Introduction:** Central odontogenic fibroma (CFO) is a benign odontogenic tumour derived from the dental mesenchymal tissues.

It is an uncommon pathology that could be found in all age-groups, and in both the mandible and the maxilla. In the maxilla, this lesion mainly involves the anterior region, whereas in the mandible, the lesion tends to be located in the posterior area. Radiologically, it presents as a well defined unilocular or multilocular radiolucency. CFO usually develops asymptomatically. However, larger and more severe lesions may be associated to root resorption and/or displacement of the neighbouring teeth. Treatment involves surgical enucleation as well as follow-up of the patient.

**Case:** A 24-year-old caucasian male patient was referred, reporting a pressure on the left side of the upper jaw. There were no other symptoms and no recent history of pain. Clinical examination did not reveal buccal or palatal expansion but left maxillary second premolar was with mobility. Radiographic evaluation showed the presence of a unilocular radiolucent well-defined area involving the roots of the maxillary left canine, first and second premolars. After endodontic treatment of involved teeth (23, 24, 25), the lesion was surgically removed under general anaesthesia. The histopathological diagnosis confirms a central odontogenic fibroma. The patient showed no clinical or radiographic signs of recurrence 1 year after surgical excision.

**Conclusion:** Rarity of this tumour excludes it from most differential diagnosis, and when diagnosed, it is an unexpected finding. It is important that health care professionals have in mind this lesion when diagnosing odontogenic tumors.

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**Tooth Agenesis: Is There More Than Missing Teeth?**

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**Introduction:** Tooth agenesis is the most common developmental anomaly of the human dentition. It occurs as part of a genetic syndrome or as an isolated sporadic or familial finding. The genetic basis of familial tooth agenesis has been established through the identification of mutations in the MSX1, PAX9 and AXIN2 genes. Two of them (MSX1, PAX9) seem to be critical for premolar and molar development whereas, AXIN2 is associated with a less tooth-specific agenesis type but with predisposition to colorectal cancer. Given this association it would be most helpful to use tooth agenesis as a phenotypic marker for the development of colorectal cancer.

The aim of our study is to investigate the genetics of tooth agenesis in a Greek population, and to estimate the incidence of AXIN2 mutations and their association to colorectal cancer.

**Materials and methods:** Following approval from the Institution Ethics Committee, 150 tooth agenesis patients of Greek descent participated to sequence analyses of the regions containing known MSX1, PAX9 and AXIN2 mutations as previously described. Seventy-five colorectal cancer patients were also screened for the same mutations.
Results: We have identified four novel mutations in the MSX1 and PAX9 genes which are expected to create considerable changes in the structure and function of the relevant proteins and 3 AXIN2 polymorphisms in our Greek sample. These three polymorphisms are present in both tooth agenesis and colorectal cancer patients.

Conclusion: Further work should define the association of the novel genetic defects to the two phenotypes (tooth agenesis and colorectal cancer).

P551
Biological Interactions of Plasma Needle for Dentistry
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Aim: Prohibitive aspect of plasmas for dental treatment comes from reactive oxygen species or changes of saliva pH, which may cause local damage in the environment around the plasma away from the site of treatment. This study aimed to investigate these biological interactions by considering plasma-cell contact and plasma-treated medium contact at varying plasma operation parameters.

Materials and methods: AlamarBlue® assay was performed to assess proliferation of cells Human osteoblast cells (MG63) and human gingival fibroblast cells (HGF) following plasma treatment. The effects of plasma helium flow rate and duration of exposure on the cells were compared using a two-way analysis of variance (ANOVA). Both MG63 and HGF cells subjected to direct and indirect plasma treatment were also assessed qualitatively using scanning electron microscope (SEM).

Results: Indirect exposure to plasma led to some cell death. Scanning electron microscopic (SEM) images, showed that direct plasma exposure within the operating parameters led to total cell death. MG63 cells were significantly affected by duration of exposure whilst HGF cells were significantly affected by plasma gas flow rate.

Conclusion: The plasma needle used in this study requires further calibration and optimisation as well as in vitro testing before any considerations of primary in vivo animal testing can be done in view of future use for dental treatment.
elevation of parasympathetic nervous activities with reduction of sympathetic nervous activities, suggesting that himekuromoji may be effective for improvement of oral immunity and enhancement of relaxation.

P553
Oral Health of Children with Blood Disorders and Childhood Cancers
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Aim: To determine oral health status and examine the association between dental disease prevalence and patients’ medical conditions.

Methods: Upon ethical approval, dental clinical records of paediatric oncology ward patients were retrieved; incomplete records were excluded. Demographic information and medical diagnosis of subjects were compiled. Clinical findings, carried out using (i) Simplified Oral Hygiene Index (OHI-S), (ii) Gingival Index (GI), (iii) Caries prevalence (DMFT) index and Decayed, Missing and Filled Teeth (dmft) index were recorded as well as complaints related to oral symptoms.

Results: Subjects (N = 321; 197 male and 104 female) comprised primary dentition age group (n = 146, 48.5%), mixed dentition age group (n = 96, 31.5%) and permanent dentition age group (n = 95, 19.6%). Ethnicity-wise, 51.2% were Malays, 41.2% Chinese, 6.6% Indians and 1.0% others.

Leukaemia, red cell disorder, other blood disorders and miscellaneous tumours were diagnosed in 49.2%, 10.3% and 40.5% of the subjects, respectively. All subjects were at different stages of disease upon examination.

Prevalence of gingivitis was low in leukaemia (10%), red cell disorder (7%) and other tumours groups (18%), however it was higher in other blood disorders group (33%) and miscellaneous tumours (40%).

For oral health status category, the odds ratio for caries prevalence with poor OH was 7.12 (95% CI 2.33–21.64, p < 0.05). The association between gingivitis and caries prevalence was found to be not statistically significant (p > 0.05).

Conclusion: Young patients with blood disorder and childhood cancers appear to be more at risk of dental caries in spite of relatively low prevalence of gingivitis.

P554
Relationship Between Gastroesophageal Reflux Disease and Dental Erosion
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Aim: The aim of this study was to investigate the casual relationship between gastroesophageal reflux disease and dental erosion.

Methods: The research was performed with two working groups consisting of the total of 100 people between the ages of 16 and 65. Ethics committee approval was received. Fifty individuals who described symptoms of reflux at least 1 years and endoscopic oesophagitis have been identified formed the patient group and 50 healthy individuals formed the control group. The people who have the habit such as ruminating, vomiting or bruxism and any medication users were excluded. Dental erosion was evaluated by the Smith and Knight index. Pearson chi-square test and Fisher exact test were used for the statistical analysis.

Results: Wear of palatal surface of maxillary teeth was observed in the patient group, but no wear was observed in the control group (p < 0.05). Wear of insinal surface of maxillary anterior teeth and occlusal surface of maxillary/mandibular posterior teeth was observed at certain rates in both groups, but the values were higher in the patient group (p < 0.05). The wear values of cervical and buccal/labial surfaces of maxillary teeth, cervical, buccal and lingual surfaces of mandibular posterior teeth and all surfaces of mandibular anterior teeth were not found different between the groups (p > 0.05).

Conclusion: Dentists should be considered the GERD patients as a risk group in terms of dental erosion and should be in interdisciplinary co-operation with gastroenterology for acid suppression and treatment of the disease.

P555
Evaluation of Location of the Mental Foramen: A Radiographic Study
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Aim: The aim of the present study was to investigate the location of the mental foramen on digital panoramic radiographs of the patients in a selected Turkish population.

Materials and methods: In this study, 323 digital panoramic radiographs of patients (163 females, 160 males) were analyzed. The patients’ ages ranged from 13 to 68 years, and mean age was 30.4. All patients had fully erupted lower premolars and there was no missing teeth in the mandibular anterior region. In addition, the radiographs were free from radiolucent or radiopaque lesions in the lower arch. Both of the mental foramen were definable on all panoramic radiographs. The different locations of mental foramen on panoramic radiographs were evaluated according to first and second lower premolars and as symmetric and asymmetric. The average distance between mental foramen and inferior border of mandible was also analyzed.

Results: The most frequent locations of mental foramen are between first and second premolars (%61.1) and in line with the second premolar (%26.6). Mental foramen was symmetrical in % 61.3 of patients. Its average distance, on the right side, to the inferior border of the mandible is 13.28 mm, on the left side it is 13.13 mm.
To know the position of the mental foramen is important for regional anasthesia, surgical procedures and the placement of osseo-integrated implants in the mandibular premolar region.

P556
Prevalence of Temporomandibular Disorders in Faculty of Dentistry, University of Malaya
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Aim or Purpose: The aim of this epidemiological study was to determine the prevalence of Temporomandibular Disorders (TMD) among students, staffs, and patients in Faculty of Dentistry, University of Malaya.

Methods: A total of 488 subjects, aged 16 to 84 year old, which were selected randomly from students, staffs and patients in Faculty of Dentistry, University of Malaya. Ethical approval was obtained prior to the study. Questionnaire based interview and clinical examinations were carried out according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). Diagnosis was made and information regarding ethnic groups, socio-demographic data, dental status, parafunctional habits were included.

Results: One hundred and ninety-six (40.2%; 84 male and 112 female) subjects were diagnosed with RDC/TMD. Distribution of each RDC/TMD group were as follows; group I – 31.1% (N = 61), group II – 56.1% (N = 110), group III – 7.7% (N = 15) and multiple diagnoses of subgroup combination 5.1% (N = 10). RDC/TMD were diagnosed in 36.2%, 45.4%, 17.4% and 1% within the ethnic group; Malay, Chinese, Indian and other races respectively. No statistically significant difference was noted between ethnic (p > 0.05). Among the subjects wearing denture 40.6% (N = 69) were diagnosed with RDC/TMD. Parafunctional habits showed significant association in the subjects diagnosed with TMD.

Conclusions: Result of the study indicated within subjects diagnosed with RDC/TMD group II was found to be higher.

P557
Incidence of Canine Impaction and Transmigration
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Aim: The aim of this study was to evaluate incidence of impacted maxillary and mandibular canines and determine the incidence of transmigrant maxillary and mandibular canine teeth with regard to their transmigration patterns in a Turkish sub-population.

Materials and methods: Maxillary canine impaction is a well known dental anomaly and the incidence is in the range 0.8–2.8%. Mandibular canine impaction is less frequent and the incidence was reported to be 20 times lower than that for maxillary canines. Migration of a tooth across the midline is an even rarer anomaly. In this study, 1780 consecutive panoramic radiographs were evaluated. The transmigrant mandibular canines were classified according to Mupparapu.

Results: The incidence of canine impaction was found to be 3.03%. The incidence of canine transmigration was 0.44%. The most frequent impacted canines were maxillary left canines (41.53%) and the most frequent position was mesioangular position (73.84%) and the most frequent transmigration pattern was type I (50%).

According to a study which was performed in 2004 with Turkish patients, incidence of canine impaction was found 3.58% and the incidence of canine transmigration was 0.31%. According to our results the incidence of impacted canine teeth and transmigration may be more frequent than was previously thought.

P558
Fibro-Osseous Lesions: A Clinicopathological Study and Reclassification
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Introduction: Fibro osseous lesions are a group of osseous lesions defined as replacement of normal bone structure with connective tissue, osseous and/or cementum-like calcified materials. For many years, the lesions have shown complications in classification. There is not a fully accepted classification for these lesions. The aim of this study was to determine clinicopathological features of these lesions and attempt to re-classification of fibro-osseous lesions.

Materials and methods: One of the fibro-osseous lesions group was selected and evaluated by light microscopy. In order to correct diagnosis, clinical variables, such as age, sex, location of lesion, pain, expansion as well as radiographic features were recorded. Also, microscopic features, including connective tissue stroma, type of calcified materials, inflammatory cells, and presence of giant cells, hemorrhage and osteoblastic border were recorded. In addition, the pattern of calcified materials, produced by the lesion, was studied by polarized light microscopy.

Results: Among 8893 cases, fibro osseous lesions were found consisting of 0.82% of total cases. Ossifying fibroma showed the highest frequency (59.9%). Whilst, periapical and focal cemento-osseous dysplasia (each 1.3%) revealed the lowest. Fibrous dysplasia consisted of 13.6% and Juvenile ossifying fibromas 2.7% of total cases. Fibro osseous lesion were prevalent in females in the 2nd decade.

Conclusion: Base on the results of the study, the necessity of combining all clinical, radiographic, surgical and pathologic findings is emphasized to achieve final correct diagnosis of fibro-osseous lesions. In addition, in controversial cases, applying polarized light microscopy is recommended as an adjunct diagnosis tool.
Patient: A Case Report of a Loosened Abutment and Fractured Abutment at the Same P559

Theme: Implantology: Implantology

SEM and Fractography Analysis of the Screw Threads of a Loosened Abutment and Fractured Abutment at the Same Patient: A Case Report

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Aim: The aim of the present study is an analysis and structural examination of screw thread of a fractured abutment and loosened abutment compared with screw threads of a new abutment screw.

Case: The fractured abutment screw was determined in the clinical examination of the patient who consulted to the prosthodontology department with the complaint of his fractured Locator abutment. In his clinical examination it was seen that his Locator abutment at 33 region was fractured and the fractured part of the screw was still inside the implant. The other Locator abutment at 43 region was also loosened. The fractured screw was removed with an ultrasonic instrument successfully and the other abutment also removed in order to be changed with a new one. Both of the abutments were changed with new ones and the occlusion of all the dentures were turned into bilateral balanced occlusion. Six months and twelve months after the delivery of the dentures, the patient came for his recalls. There was not seen any problems in his clinical examination. The loosening of screw threads, fractured screw threads were retrieved and analyzed under SEM. They were also compared to screw thread with a new Locator abutment of the same implant system.

Conclusion: Many alterations and deformations were present in concavities and convexities of threads in the loosened and fractured screws. No macroscopic alterations or deformations were observed in the loosening abutment.

Short Implant Rehabilitation of Patients with Atrophic Maxilla: P561

Case Series

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Objectives: Short dental implants, having length of 8 mm or less, can be placed or used as an alternative to bone augmentation procedures for allowing the placement of longer implants.

Short implants could be a simpler, cheaper and faster alternative with less associated morbidity to longer implants placed in augmented bone.

We present three patients having maxillary alveolar crest deficiency rehabilitated with short implants restorations.

Case Series: In this study, we used short implants with plateau design, screwless, locker taper, in length of 6–8 mm for rehabilitation severely resorbed maxillary alveolar crest in patients.

Case 1: A 43-year-old male patient had lost the right maxillary premolar and molar teeth. Three pieces of short implants with 6 and 8 mm in length were inserted in this region. After 5 months, this area restored with implant supported crown–bridge prostheses.

Case 2: A 60-year-old male patient had fully edentulous maxillary arc with prolapsed sinuses. Eight piece of short implant has been placed in the upper jaw. Then the patient’s upper jaw was restored with implant supported fixed prosthesis.

Case 3: A 56-year-old male patient had edentulous right posterior maxillary arc and also he had a little bit sinus prolapsed situation in his molar region. He finally treated with crown-bridge restoration supported with short length of implants.

Conclusions: This study shows that the use of short implants may be considered for prosthetic rehabilitation of the severely atrophic maxilla as an alternative to more complicated surgical techniques as sinus, nasal floor lifting, etc.
Esthetic Solutions for Congenitally Missing Maxillary Lateral Incisors
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Introduction: There are various alternatives for treating congenitally missing lateral incisors. Treatment options include using canines as substitutes, tooth-supported restorations, auto-transplantation and orthodontically preparing adequate space for a single tooth implant.

Case: In our cases; considering arch length discrepancy, upper incisor inclinations and facial esthetics, it was decided to prepare adequate space for lateral implants on one side and to restore peg shaped lateral incisors prosthetically on the other side. To achieve this goal after levelling and aligning; opening the required space with coil-springs was initiated. As there was no contralateral tooth available to measure the mesiodistal width of the lateral incisors; it was calculated according to the central incisors. After preparing enough space for both lateral incisors; consulting with oral implantology we decided to assess the skeletal maturity of the patients. Hand and wrist radiograph validated our implant placement time. Pre-prosthetic orthodontic treatment was successful. Enough space for both single tooth implants and restorations were prepared orthodontically with paying attention to the root divergence in the implant site. For both patients, Nobel GroovyTM implants (3.5 mm diameters, 10 mm length) were inserted on the agenesis sides. After having waited for 3 months for osseointegration, NobelProcera ZirconiaTM abutments were placed and Zirconium crown restorations were prepared for both sides.

Conclusion: Among all treatment options for congenitally missing lateral incisors, preparing adequate space for implants and restorations is the most conservative approach to provide esthetic and functional demands.

Comparison of an Alloplastic and a Xenogeneic Bone Graft Materials
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Aim or purpose: To compare two bone graft materials that are used for the same purposes in implantology procedures.

Materials and methods: Grafting material morphology was assessed by scanning electron microscopy (SEM), by spreading a few granules on a double-sided carbon conductive tape. Particle size distribution was determined by laser diffraction spectrometry. At least three measurements were performed for each sample. Information regarding samples porosity and pore size distribution was obtained by mercury intrusion porosimetry. The porosity was calculated as the ratio of the total volume of mercury intruded and the total sample volume. Two samples of each material were analyzed by this technique. The particles real density (mass per volume of solid, excluding empty spaces) was determined by gas pycnometry. Samples specific surface area was measured by the nitrogen absorption technique using the BET method. For contact angle analysis, the materials were compressed into pellets with a manual hydraulic press.

Results: The results showed that the two grafts have quite different characteristics in practically all the evaluated properties. In what concerns shape, surface topography and size, xenogeneic granules, besides being larger, are irregular, and exhibit sharp-edged tips, while synthetic ones are approximately cylindrical, with round contours, and more uniform in size. Also, the specific surface area of the xenogeneic material is considerably higher than the one of the synthetic one.

Conclusions: It is believed the provided data will assist clinicians to make a more informed choice between these two classes of regeneration materials.

Evaluation of Periodontal Regular Maintenance for Dental Implant Patients
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Purpose: The aim of this retrospective study was to evaluate the effect of 5-years of regular maintenance for patients with dental implants.

Methods and materials: Seventy-four patients with 284 implant cases that visited our private dental office (Aso Dental Clinic) between 2007 and 2013 were selected. They were divided into a regular periodontal maintained group (RG; 49 patients with 198 implant cases, 21 men and 28 women) and an irregular group (IG; 25 patients with 86 implant cases, 13 men and 12 women). Each patient was evaluated in terms of plaque control record (PCR), bleeding on probing (BOP), and the number of pockets with probing depth over 4 mm (NP) at initial visit and 5 years after implant treatment. The amount of bone resorption (BR) and remaining supportive bone (RSB) of each implant were measured on x-ray film, and the proportion of implants with BR over 2 mm (BRP) was calculated in each group. Fisher’s exact test was used to analyze BRP between the two groups. The student t-test was used to analyze other survey items between the two groups.

Results: There were significant differences in PCR between the groups at both times (p < 0.05). The BR of IG showed a significantly higher value following 5 years (p < 0.01). The BRP of IG also showed a significantly higher value following 5 years (p < 0.05).

Conclusion: The results suggest that regular maintenance may prevent bone resorption following dental implant treatment.
Clinical and Radiographic Evaluation of Early Loaded Maxillary Anterior Single Tooth Bone Level Implants
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Purpose: The aim of this study was to evaluate the clinical and radiographic outcome of early loaded implants in the esthetically demanding regions.

Methods and materials: Patients were treated with implant (Straumann Bone Level Implant, Institute Straumann, Basel, Switzerland) supported all ceramic single crowns and followed for 2–4 years. The implants were evaluated by clinical and radiographic parameters. Clinical parameters like plaque index, sulcus bleeding index, peri-implant probing depth (PD), and marginal bone loss (MBL) were recorded. Repeated-measurement ANOVA, Kruskal-Wallis test, Wilcoxon signed rank test and paired samples test were used for statistical analysis.

Results: Fifty-five implants were placed in 47 patients. At the recall examinations, all implants were successfully integrated, demonstrating healthy peri-implant soft tissues as documented by standard clinical parameters. Plaque accumulation scores of 2 and 3 were not noted during the entire study. At baseline the mean PD value was 2.15 (0.62) mm, 2.24 (0.61) mm at 2 years. The PD of the implants at 3 years was 2.22 (0.62) and the mean PD of 7 implants was 1.86 (0.37) mm at 4 years. There were no statistically significant differences between time intervals (p > 0.05). All implants showed less than 0.5 mm MBL. Seven of the implants showed an increase at the level of the bone contact. The difference between baseline and last recall in mean MBL value was 0.119 ± 0.21 mm in mesial side, and 0.158 ± 0.254 mm in distal side. There were no statistically significant differences within time (p > 0.05).

P567
Comparison of Two Block-Out Methods for Mandibular Implant Retained Overdentures
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Objective: The aim of this study was to compare two direct incorporation methods of o-ring attachments over for both angled and parallelly inserted implants used as retentive components for mandibular overdentures.

Materials and methods: Forty dental practitioners were assigned for this study. Each practitioner were asked to attach the o-ring retentive component to the previously fabricated overdenture prostheses. Eighty implants analogs (40 angled, 40 parallel) with ball attachment abutments were embedded in 40 gypsum models, simulating the edentulous mandibular ridge. Twenty models were including 30° angled to each other and 20 models were including parallel o-ring abutments. Randomised 40 gypsum models including implants either angulated or parallel were given to 40 dentists. Each dentist used composite resin or rubber dam for block-out material equally.

Results: Direct attachment incorporation with rubber dam was found less successful for both groups; but the angulated group recorded statistically significant lower scores. Composite resin was successful for both groups and the parallel group scored higher.

Conclusion: When implant retained overdentures are in question, while incorporating the attachments to the overdenture, the preference of composite resin as a block-out material is superior to rubber dam.
Results: Immediate results using surgical guide are excellent only if are respected the surgical plan and adequate protocol. In 3 cases was necessary to re-suture the surgical wound caused by local conditions of oral flaps. Failure of implants was observed only in 4 cases due to inadequate bone quality.

Conclusions: Implant surgical procedures using prefabricated surgical guide are improved only if we use an adequate protocol both in planning and in the accurate technique.

P570
Oral Implantology by the Electro-Welding Technique
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Aim: The aim of this study is to demonstrate the efficiency of a method through which, in the same session, after inserting the implants you can rehabilitate the prosthetic field using a resin fixed denture, restoring the function and aesthetics of the stomatognathic system.

Materials and methods: The implanto-prosthetic protocol (for the two clinical situations presented) consists of 3 phases: presurgical, surgical and postsurgical.

The presurgical phase consists of the instrumental and radiological evaluation of the general and specific conditions.

The surgical phase consists of anesthesia, preparation of the implantation situs (flapless), positioning the titan implants and wielding the titan solidification bar (placement, wielding, cooling).

The postsurgical phase consists of establishing a fixed prosthesis and reestablishing the occlusal relationships in the same session.

Results: The results showed the efficiency of the electro-welding technique associated with a minimally invasive surgery technique, which recalibrates the functionality and aesthetics of the stomatognathic system.

Conclusions: The one step electro-welding implantology is an efficient technique, that brings predictable results in rehabilitation of the total edentulous patients. Using the immediate load, it provides comfort and fast recovery of the patient health.

Theme: Implantology: Oral Medicine

P571
Transcriptome Analysis of bFGF-Induced Rat Pheochromocytoma Cells
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Aim: Growth factors can regulate the proliferative or differentiation processes by analogous mechanisms. Basic fibroblast growth factor (bFGF), a member of FGF family, has broad biological functions involving the regulation of cell growth, differentiation, and proliferation.

Methods and materials: We sought to elucidate the pattern of the molecular mechanisms governing the bFGF-induced rat pheochromocytoma cell line, PC12, likely involve multiple converging signal transduction pathways. Total RNA was extracted after 24 h of bFGF-treatment in PC12 cells and monitored mRNA levels using Affymetrix GeneChip (rat Genome 230 2.0 Array). GeneChip data was analyzed by GeneSpring software and Ingenuity Pathway Analysis system. Real-time RT-PCR and Western blot were used to investigate the gene expression changes.

Results: The differentially expressed genes represented functions as diverse as growth and differentiation. DUSP showed a greater than two fold change in expression relative to those in control cells. Altered mRNA levels in GeneChip analysis were confirmed by real-time RT-PCR. We have identified differential gene expression up-regulated or down-regulated with the up-regulation of DUSP in bFGF-treated cells. Another important finding of our study provides the data on the involvement of DUSP in ERK-dependent signaling pathways in PC12 cells, which suggests a central role of ERK in the neuronal induction by bFGF.

Conclusion: These findings indicate that the molecular mechanisms underlying the DUSP response of PC12 cells to bFGF treatment likely involve multiple converging signal transduction pathways.

Theme: Implantology: Oral Surgery

P572
Medical Management of Complications Induced by Biphosphonates in Maxillomandibular Complex
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Biphosphonates are compounds used in prevention and treatment of bone resorption pathologies. They are mainly prescribed by doctors in the field of gynecology, traumatology, oncology and endocrinology.

Purpose: Establish the knowledge and management of the medical area about the complications aroused by the biphosphonates treatment in the maxillomandibular complex. MATERIALS AND METHODS A survey was made to a population of 71 venezuelan medical professionals in the areas of gynecology, traumatology, oncology and endocrinology who prescribed different types of biphosphonates between October 2011 and July 2012. RESULTS Most of the professionals surveyed prescribe biphosphonates using bone densitometry as the main diagnosis criteria, been alendronate and ibandronate the most commonly prescribed BFF. Seventy-seven percent of the ones who prescribe BFF don’t refer the patient to the dentist to get an evaluation before starting the biphosphonates therapy. Only 17% of the doctors have seen a case of osteonecrosis of the jaw in their practice and in case of finding evidence of osteonecrosis 77% of the surveyed would suspend the treatment and only 7% would consider following the dentist’s guidance.

Conclusions: There’s a lack of communication between Venezuelan dentists and doctors resulting in doctor’s poor understanding of the complications in the maxillo-mandibular complex caused by the treatment involving BFF. We strongly suggest creating stronger bonds between both professions in order to reduce complications involving the maxillo-mandibular complex and ensure the patient’s wellbeing.

Theme: Implantology: Oral Pathology

P573
Retrospective Investigation for the Space-Occupying Lesions of the Temporomandibular Joint
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Purpose: To study the clinical, radiological and pathological manifestations of space-occupying lesions of the temporomandibular joint and provide references for the early diagnosis and treatment of these diseases.

Methods and materials: To review the clinical data of space-occupying lesions of the temporomandibular joint in Peking University School of Stomatology between January of 1990 and March of 2013. Two hundred and twenty-seven cases of temporomandibular joint space-occupying lesions undertaken surgery and verified by pathological examinations were selected for the retrospective analysis.

Results: Among 227 tumors and tumor-like lesions of temporomandibular joint with surgery, female was 153, male was 74, and the ratio of female to male was 2.1:1. The ages ranged from 8 to 70 years old, and the median age was 36. The courses of diseases were half a month to 20 years, and the median was 2 years. There were benign tumors and tumor-like lesions, 212, occupying 93.39%; malignant tumors, 15, occupying 6.61%. Osteoma was the commonest among all of the lesions, 33.04%. The followings were condylar hypertrophy, 20.26% and synovial chondromatosis, 15.42%. Chondrosarcoma is the commonest among the malignant tumors, 3.08%; then followed by osteosarcoma, metastasis and synovial sarcoma, etc.

Conclusions: Space-occupying lesions of the temporomandibular joint include tumors and tumor-like lesions which may mimic the symptoms of TMD, and the differential diagnosis is necessary. The clinician must be careful to these lesions so as to give the early diagnosis, correct treatment and avoid misdiagnosis.

P574
Minimally Invasive Approach for the Treatment of Advanced BRONJ
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**Introduction:** Osteonecrosis of the jaw is a rare but serious adverse side effect of specific type of antiresorptive and/or biological therapy, which affects bone metabolism. Bisphosphonate – related osteonecrosis of the jaw occurs especially in oncological patients, but also much less frequently in patients with metabolic bone diseases. Up to 70% of these lesions arise after invasive procedures in the oral cavity.

**Case:** The authors present an unusual case of 57 years old woman with rheumatoid arthritis and glucocorticosteroid – induced osteoporosis receiving prednisone, leflunomide and alendronate. Osteonecrosis of the mandible with progression up to the 3rd stage with a pathological fracture developed gradually after teeth extractions in this patient. This lesion was treated by minimally invasive procedures, symptomatic and antibacterial therapy, which led to the complete resolution (systemic and local antimicrobials, pain control, superficial debridement, sequestrectomy in local anesthesia, semi-liquid diet, idle mode). The clinical course of this pathological condition in a period of 5 years is presented.

**Conclusion:** The jaw bone under the influence of bisphosphonate medication may still have sufficient healing potential even in the cases of severe osteonecrosis. Therefore a conservative approach may be considered even in patients with nondisplaced and nonmobile mandibular pathological fractures with minimal clinical symptoms. A radical surgical treatment with potential risk of deterioration could be reserved for other cases of pathological fractures and for symptomatic and refractory lesions of the 3rd clinical stage.

**P575**

**Effects of Ozone Therapy on Postoperative Discomfort Following Third Molar Surgery**

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**Objective:** To evaluate the efficacy of the therapeutic ozone application in the management of pain, swelling, and trismus associated with surgical removal of impacted mandibular third molars.

**Study design:** Twenty consecutive patients with asymptomatic bilateral impacted mandibular third molars were recruited into the study. One side was extracted and received ozone therapy (study side), and the other side was extracted 2 weeks later from the first operation and received sham ozone therapy (negative control side), or diametrically opposed to this for correlation of post-operative pain development by patients.

**Results:** The study consisted of 20 patients (mean age: 22.6 ± 2.3 years, ranges from 18 to 25 years) with asymptomatic bilateral impacted mandibular third molars. No differences were found for mouth opening and swelling for both sides. The degree of pain and the number of analgesics tablets taken was significantly lower at study side. This study showed that ozone therapy had positive effect on OHIP-14 questionnaire results. Alveolar osteitis, paraesthesiae, bleeding, or altered nerve sensation was not observed in any patient post-operatively.

**Conclusion:** This study has demonstrated that ozone therapy is useful for the reduction of postoperative pain and it increases quality of life after third-molar surgery. However, it has no effect on postoperative swelling, and trismus.

**P576**

**Evaluation of Life Quality after Apicoectomy**

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**Aim:** The aim of this study was to evaluate patient experience of quality of life following apicoectomy using two different techniques: preoperative and intra operative ortograde canal opturation.

**Methods and materials:** The study consisted of 40 patients referred for oral surgical treatment (apicoectomy with periapical osteotomy). Three operators were carried out the treatments. All patients were given a questionnaire with 15 questions to evaluate their quality of life for 7 days after the oral surgery interventions. The patient’s answers were referred as: not at all-1; very little-2; some-3; quite a bit- 4; very much-5. An equal number of patients were assigned to each group. Group 1 was treated by preoperative canal opturation and Group 2 was treated by intra operative ortograde canal opturation.

**Results:** The average time needed for completion the surgical procedure was approximately 35 min. The results showed that patients in Group 1 reported significantly more pain and took significantly more analgesics on day 5. On days 1 and 2, patients of the Group 2 reported significantly more difficulty in mouth opening, mastication, and the ability to speak.

**Conclusion:** High incidence of symptoms were reported by the patients in both groups. There were no significant differences found in the distribution of patients according to age, gender, periodiicular diagnosis, and site of operation between the two groups. The technique using the preoperative canal opturation provided significantly less postoperative pain, but more difficulties in mouth opening, mastication, and the ability to speak immediately postoperatively.

**P577**

**Cutaneous Metastasis from Esophageal Squamous Cell Carcinoma Resembling Morphea: A Case Report**

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**Background:** Cutaneous metastasis of malignant neoplasms are generally uncommon, but are being diagnosed with increasing frequency in recent years. In about 3–10% of patients with malignant neoplasms develop cutaneous metastases. Oesophageal carcinoma metastatic to the skin is relatively infrequent, accounting for approximately 3% of cutaneous metastases.
Aim: The aim of this presentation is to describe a case cutaneous metastasis from esophageal squamous cell carcinoma resembling morphea.

Case: We report an 80-year-old male, with pain over left half of the face, severe trismus, intraoral swelling, a scar-like lesion, hyperpigmented, violet-pink coloured, hard on palpation on the skin of the left cheek, and movement of the jaws was restricted.

Conclusions: Cutaneous metastases are of diagnostic importance because they may be the first presenting sign of an undiscovered malignancy and because they may indicate a poor prognosis and early fatal termination.

P578
Apicoectomy with Er-Yag Laser-Analysis of Resected Tooth Surface
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Introduction: Laser is a device that produces light beam that is monochromic, coherent and focused. The speed and efficiency of laser procedures are defined by the laser parameters, the surface area of the target and the speed with which the operator moves the hand. To achieve optimal effect, depending on the desired intervention is necessary to set appropriate terms of energy/power and frequency to obtain ideal results.

Aim of purpose: Our goal was to compare the VSP pulse, which creates the Er: YAG laser with his contact extension with the work of mechanical handpiece efficiency in their apical resection of the root, and to make analysis of resected root surface.

Material and methods: For the realization of set goals, we included 75 patients of both sexes. The samples were divided by random into five groups. The first four groups were treated with Er: YAG laser with different parameters and the fifth was a control group treated with mechanical handpiece. Analysis of the resected tooth surface was made with SEM microscope.

Results and discussion: The survey results showed a direct correlation between energy used and the time of resection. Increasing the pulse energy increases the damage of the tooth or the number of cracks of the resected tooth surface.

Conclusion: Ideal pulse parameters amounted 200 mj/20 Hz followed by 200 mj/30 Hz with subsequent equivalent effect is three times greater risk of cracking from mechanical handpiece and six times longer during the resection of the tooth surface.

P579
RFA Evaluation of Three Types of Early Loaded Implants and Marginal Bone Loss after 4 Years
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Purpose: To analyze implant stability of three different implant systems using RFA analysis and to correlate RFA measurements with 4 years of clinical and radiographical evaluation.

Methods and materials: Seventy-five implants were placed in 30 subjects posterior regions. Twenty-three Straumann (Institute Straumann AG, Waldenburg, Switzerland) (STR), 28 Astra (Astratech AB, Molndal, Sweden) (AST) and 24 Thommen (Thommen Medical AG, Waldenburg, Switzerland) (SPI) implants were inserted. RFA measurements were performed at implant placement, 1, 2, 3, 4, 5, 6, 7, and 8 weeks. Implants were loaded with prostheses after 8 weeks. After cementation of prosthesis all subjects were examined radiographically at 6, 12, 24, 36 and 48 month follow-ups.

Results: The results showed that there was no difference in the mean implant stability quotient (ISQ) values at implant placement (78.39 ± 3.95 for STR and 76.57 ± 5.12 for AST and 75.13 ± 5.72 for SPI). ISQ values were different between group (p = 0.01) (76.17 ± 4.45, 74.79 ± 5.59 and 71.50 ± 5.99 respectively for STR, AST and SPI). The effect of the dental arch and the diameter of the implant on the implant stability were statistically significant (p = 0.01). Mean marginal bone loss after 4 year was 0.22 ± 0.4 mm for ITI, 0.31 ± 0.5 mm for ASTRA, 0.39 ± 0.36 mm for SPL. All of three implant systems showed higher ISQ than clinically acceptable values for immediate/early loading. The success rate and bone loss after 4 years were similar to the values reported in the literature, thus early loading may be a useful procedure that allows reduction in treatment time.

P580
Solitary Bone Cyst: A Case Report
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Introduction: Solitary bone cyst is an intraosseous pseudocyst having a tenuous lining of connective tissue without epithelium, either empty or filled with serous or sanguinous fluid which also can be referred as simple bone cyst, traumatic bone cyst, hemorrhagic bone cyst, hemorrhagic cyst, idiopathic bone cavity and unicameral bone cyst.

Case: This case report describes a clinically and radiographically atypical case of a large multilocular solitary bone cyst involving the mandibular left body and chin region of a 13 year old boy.
Introduction: Congenital adrenal hyperplasia is an autosomal recessive hereditary disorder related to the adrenal glands, with a deficiency of 21-hydroxylase, leading to decreased production of cortisol and aldosterone with increased androgen secretion. We present a case of female patient with congenital adrenal hyperplasia rehabilitated with maxillary sinus floor augmentation and immediate implant placement.

Case: Forty-two-year-old female patient with congenital adrenal hyperplasia was using daily 0.5 mg dexamethasone. She had inadequate bone volume condition for implant placing and underwent sinus augmentation. Radiologic evaluation included orthopantomography and maxillary computed tomography. Preoperative radiograph shows 4–6 mm of residual bone height. Corticosteroid doses should be increased in those patients who take less than 30 mg a day, if the dose administered falls under this amount, the human body is not prepared to manage a stress- ing situation, which may cause an adrenal crisis. This can be avoided by duplicating the normal dose before and after the dental procedure. On the day of surgery 8 mg dexamethasone was administered to patient. During stress periods additional doses of medications are needed to avoid an adrenal crisis. Peroperatively she was administered 1 mg Midazolam, 40 mg Petidin HCL and 80 mg Methylprednisolone respectively. Treatment with antihypertensive drugs must not be interrupted. Postoperatively Cefazolin sodium (Im 2 x 1), Naproxen sodium (2 x 1) and %2 Chlorhexidine gluconate (3 x 1) was prescribed for 7 days. Five implants were placed after internal sinus lift in maxillary area after extractions and four implants were placed in mandible. After osteointegration, the implant supported fixed prosthesis were performed.

Effectiveness of A New Flap Technique on Primary Wound Healing After Lower Third Molar: A Pilot Study

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Objective: To investigate the effectiveness of a new flap design on primary wound healing.

Study design: In this split mouth study, 13 patients with bilateral mesio-angular impacted mandibular third molars were included. Twenty-six 26 mesio-angular impacted mandibular third molars were extracted. Two different flap designs were used: a modified triangular flap and a new flap technique. On the 7th day after surgery, sutures were removed and primary wound healing was evaluated.

Results: In modified triangular flap group, wound dehiscences developed in 7 of 13 the patients. In the new flap group, wound dehiscences developed in 3 of 13 the patients.

Conclusion: The new flap technique seems to be more effective on primary wound healing after lower third molar surgery.

Surgical Management of Panfacial Fracture: A Case Report

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Introduction: Panfacial fractures present remarkable challenges to both surgeon and patient. Panfacial fractures are defined as fractures that simultaneously involve the upper, middle, and lower face. This type of trauma mainly involves the mandible, maxilla, zygomatic complex, naso-orbito-ethmoid region, and frontal bone and is often associated with emergencies, such as craniofacial injury. Severe panfacial fractures can lead to complicated facial deformities, malocclusion and limited facial movement. This can lead to posttraumatic deformities that greatly influence the patient psychologically and limit his social rehabilitation, sometimes permanently.

Case: In this report, a panfacial fracture due to traffic accident, involved Le Fort I maxillary fracture, mandibular symphysis fracture and bilateral mandibular condyle fracture and its treatment with open reduction.

The Interdisciplinary Treatment of Insufficient Inter-Oclusal Distance

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Introduction: Deficiencies occur in inter-occlusal distance because of the position of the teeth to be replaced in the long-term untreated partial edentulous patient.

Case: In our poster presentation, we aimed to present a 43-year old woman who suffered from partial edentulism was referred to our hospital. There were inadequate inter-arch distance and bone height for placing endosseos dental implants in the left posterior maxilla at clinical examination. A mucous retention cyst determined along the left sinus lining on the cone beam CT. The symptomless cyst was removed in order to do sinus lifting operation. There was no problem after 3 months and sinus lifting was performed with alloplastic graft material. After a healing period (6 month) inter-arch distance was increased with alveolar bone removing on the left posterior maxilla and endosseoz dental implants were inserted in that area. Also posterior mandibular premolars were treated endodontically. All posterior teeth were restored with metal fused ceramic restorations.

Maxillary Primary Intraosseous Carcinoma Arising De Novo: A Case Report

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Introduction: Maxillary primary intraosseous carcinoma, very rare disease, is usually invasive and metastatic. The purpose of this report is to present the case of a 73-year-old woman who had a very rare case of maxillary primary intraosseous carcinoma, arising de novo and completely resectable. She also was referred to our hospital for surgical treatment of a maxillary sinus tumor of unknown origin with the chief complaint of a maxillary swelling for 2 weeks.

Case: In our case, a 73-year-old woman referred to our hospital for surgical treatment of a maxillary sinus tumor of unknown origin with chief complaint of maxillary swelling for 2 weeks. She had no history of nasal or sinus surgery. She had no symptoms such as sinusitis, infectious disease or traumatic fracture of her maxilla. Her medical history was also unremarkable. She was admitted to our hospital with maxillary sinus tumor of unknown origin. She had no signs of maxillary sinus infection and no dental or maxillary sinus disease. The lesion was excised and the maxillary sinus was removed and the sinus was reconstructed with a retro-auricular temporalis fascia graft. The histological examination revealed a maxillary primary intraosseous carcinoma of unknown origin.
Aim: Maxillary primary intraosseous carcinoma (PIOC) is a rare malignant neoplasm with poor diagnosis. In this case report we represent a case of PIOC in the posterior maxilla.

Case: A 45 year-old male applied to our clinic painless swelling in the left posterior maxilla last 10 days.

He had no systemic disease and habit except smoking for 20 years. There were no anomalies extraorally. Intraorally we observed a non-ulcerated area of red, bleeding swelling between the teeth 2.4 and 2.7 on the left maxillary alveolar ridge. Patient proclaimed that the teeth 2.6 in the lesion exfoliated spontaneously. Panoramic radiography showed a large unilocular radiolucency in the left maxilla with ill-defined borders. Inferior border of the maxilla associated with the lesion was missing, no cortical boundaries of maxillary sinus could be viewed and the nasal septum was deviated to the right. The patient was guided to the oral&maxillofacial surgery clinic for biopsy. Histopathological observation showed squamous cell carcinoma (SCC). So he was treated by hemi-maxillectomy and radical neck dissection in the otolaryngology clinic. After the operation for prothetic rehabilitation an obturator was done. There were no metastases and recurrence after 1 year follow-up.

Conclusion: Histological evidence of SCC, no ulceration on the lesion and no distant primary tumor at the time of diagnosis and at least 6 months during the follow-up are the three specific criteria of PIOC. There were a few case reports about the maxillary PIOC. Early diagnose and radical treatment is very important for better prognosis.

Theme: Preventive Dentistry: Caries

P586
In-Vitro Studies on Na-alginate/Cetylpyridinium chloride Complex as an Antiplaque Agent
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Purpose: The purpose of study was to investigate the effects of sodium alginate with cetylpyridinium chloride (CPC) complex on In-vitro dental plaque formation.

Methods: Mucin coated Hydroxyapatite (HAP) Disks (Clarkson Chromatography Products) were placed in a 24 well and treated with 1 ml of test solution for 1 h at 35°C.

Test solutions were (1) CPC with different types of anionic polymers as sodium alginate, sodium carboxymethyl cellulose, xanthan gum, (2) CPC with differentiated sodium alginate content as 0% to 1.0% (3) The tested CPC with sodium alginate complex was compared to chlorhexidine 0.12%.

After treated 1 h, each well was washed three times and an overnight bacterial culture, biofilms of Streptococcus mutans (NCTC 10449), was added to each well. After 24 h incubation, stained with 1 ml of 0.1% (w/v) crystal violet and stained adherent cells were dispersed with 1 ml of 70% ethanol. The absorbance at 590 nm (OD590) was measured using a SpectraMax 190/spectrophotometer (Molecular Devices, LLC., USA).

Results: (1) CPC with sodium alginate complex significantly inhibited the growth of dental plaque compared to CPC with other anionic polymers.

(2) The antiplaque activity of CPC/sodium alginate complex enhanced as sodium alginate content increases.

(3) CPC and sodium alginate complex was highly effective against dental plaque formation than chlorhexidine 0.12%.

Conclusions: Sodium alginate enhanced delivery of CPC to mucin coated HAP disk. Na-alginate/CPC complex was significantly inhibited the growth of dental plaque In-vitro.

P587
Comparison of the Efficiency of Conventional and Modernistic Methods: An In Vitro Study
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Purpose: The purpose of study was to evaluate the validity of micro-CT and the performance of pen type laser fluorescence device.

Materials and methods: Sixty extracted teeth with intact occlusal surfaces were evaluated by two calibrated examiners, using laser fluorescence device, micro-CT, bitewing radiographs and ICDAS II visual examination system. Histological examination was performed as the gold standard for the present study.

Results: Laser fluorescence device showed high performance when compared with radiological and visual examination methods. Micro-CT showed the best performance within the all methods.

Conclusions: Pen type laser fluorescence device is a suitable method for detecting occlusal caries lesions and micro-CT can be used as a valuable method to compare the caries detection methods.

P588
Efficacy of Photodynamic Therapy (PDT) in Decreasing S. mutans
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Objective: The aim of this study was to assess the effect of erythrosine and rosebengal –mediated photodynamic therapy (PDT) on oral infections caused by S. mutans.

Methods and materials: Saliva samples of 60 children aged between 8 and 10 who have not brushed their teeth more than 12 h prior to the procedure were evaluated. Only saliva samples in which S. mutans generated were used. S. mutans were grown in
a constant-depth film fermenter. Each saliva sample which S. mutans generated were divided to six identical parts in order to constitute six groups as follows: control group with no treatment (group A), rosebengal applied group (group B), erythrosine applied group (group C), rosebengal and light applied group (group D), erythrosine and light applied group (group E), and only light applied group (group F). The samples in groups D, E, F were subjected to light for 2 min. The bactericidal efficacy of each group was evaluated by observing S. mutans proliferation. Statistical analyses were performed with PAST software. One way ANOVA analysis and Tukey’s pairwise comparisons were performed.

Results: Significant decrease of S. mutans proliferation was only observed when biofilms were exposed to both erythrosine and light and rosebengal and light (One way ANOVA test result, p < 0.01). Besides, erythrosine applied group, rosebengal applied group were found to be relatively effective on S. mutans proliferation as well (according to Tukey’s pairwise comparisons; p < 0.05 for each as well).

P589
Remineralization and Caries Prevention Using Ammonium Hexafluorosilicate and Shrimp Paste
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Aim: To evaluate using fermented shrimp paste (SP) and ammonium hexafluorosilicate (SiF) for remineralization potential and acid resistance of enamel and root dentin.

Methods: One hundred and twenty bovine enamel and 120 bovine dentin specimens were used in the study. Baseline radio density was measured for all specimens using digital radiography. Half of the enamel and half of the dentin specimens were used for evaluation of remineralization potential of the agents, where the specimens were subjected to a demineralizing agent (phosphoric acid), then radio density was re-evaluated. Either SiF or SP was applied to the surfaces and radio density was re-evaluated. For the preventive phase of the study, the agents were applied to the specimens prior to the application of the demineralizing agent to assess their effect on acid resistance. Radio density was evaluated after subjecting the specimens to the demineralizing agent. Changes in radio density were compared using paired t-tests.

Results: With remineralization, Both SP and SiF showed significant change in enamel radiodensity while with dentin, only SiF was effective in remineralization. For acid resistance, mineral loss was significantly less than the control specimens for both enamel and dentin. SiF was more effective than SP with the dentin specimens while SP had a significantly more pronounced effect on enamel.

Conclusion: both agents can be beneficial for remineralization and acid resistance, with SiF being more effective in remineralization due to its high Fluoride content and low pH, and SP due to its high Calcium and protein content.

P590
The Relationship of Temporomandibular Disorders and Body Posture at Different Dentition Stages
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Aim: Temporomandibular disorder (TMD) is a pathological situation including masticatory muscles, head-neck muscles and temporomandibular joint. The relationship between body posture and alterations at stomatognathic system has become a subject of interest. The aim of this epidemiological study was to investigate the relationship between TMD and postural changings.

Methods and materials: This study included 1375 individuals was planned as a cross-sectional study containing the intra-oral and extra-oral examinations and evaluation of the photographs taken in front and in profile to investigate the association between TMD and body posture.

Results: As a result of general investigation of all children, forward head position and different shoulder levels were statistically related to the TMD (p < 0.05). At primary dentition, there was no significant relation between the forward head position and TMD, however, different shoulder levels were found to be significantly related to the TMD (p < 0.05). At mixed dentition, both of these parameters were statistically related to the TMD (p < 0.05). At the permanent dentition, there was no relation between the body posture and TMD.

Conclusion: TMD and body posture are parameters affect each other. The longitudinal studies including homogeneous sample groups at primary, mixed and permanent dentitions are needed for better evaluation of these relationship.

P591
The Effect of Socio-Demographic Factors on Partial Denture Classification among the Turkish Population
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Objective: To examine the individuals with partial edentulousness in the Turkish population from a socio-demographic perspective based on the Kennedy classification in order to determine the risk factors for teeth losses.

Materials and methods: The study consisted of 1706 partial denture wearers (911 men and 795 women). The maxillary and mandibular structures of patients according to Kennedy classification and their age, sex, place of birth and education status were evaluated. The collected data was analyzed using both the chi-squared test and Fisher’s Exact Chi-Squared test at a significance level of p < 0.05.

Results: A statistically significant difference was observed among the maxillary/mandibular Kennedy classes in terms of age groups.
(p < 0.001), the types of prostheses used and maxillary/mandibular Kennedy classes in the antagonist jaws (p < 0.01) and maxillary Kennedy classes and birthplaces (p < 0.03).

**Conclusion:** Socio-demographic changes were found to be closely related with the Kennedy classification of partial denture wearers.

**P592**

**Caries Status among Kindergarten Children in Kuwait**

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**Objectives:** The aim of this study was to investigate the caries prevalence and severity in kindergarten children in Kuwait.

**Materials and methods:** In a cross sectional survey, a representative sample of 808 children were chosen from 23 kindergarten schools in Al-Farwaniya governorate in Kuwait. Two dental hygienists examined the children at their schools. Examination was done using mirror and periodontal probe with the presence of artificial light source on a portable dental chair. Dental data collected were: decayed, missed, and filled teeth along with other socio-demographic data.

**Results:** In 2010, eight hundred and eight children were examined with the mean age of the children that were examined was 1.1 years. Male children were 46% (n = 370) and females were 54% (n = 438). Caries prevalence in 4 year olds children was 61%. Children without caries experience were 37%. The mean dmft was 4.3 ± 5. The mean decayed teeth were 4 ± 4.7, the mean missing teeth 0.2 ± 0.7, and the mean filled was 0.2 ± 0.7. No statistically significant differences were seen between genders; both gender had almost similar caries prevalence and caries severity.

**Conclusion:** Caries prevalence and severity in kindergarten school was high among the examined group. These results indicate an urgent need for a prevention program in Kuwait to control early childhood caries. Oral prevention program for children in age group of 1 to 4 years should be planned in future.

**P593**

**Disk Position and Articular Eminence Inclination in Patients with Temporomandibular Joint Internal Derangement**

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**Objective:** The purpose of this study was to investigate the association of disk displacement with the inclination of the articular eminence in patients with temporomandibular joint internal derangement.

**Methods:** A total of 208 joints of 104 patients (28.94 ± 9.35 year-old, n = 84 female/n = 20 male) with TMDs were examined by magnetic resonance imaging (MRI). Bilateral MRI scans in the sagittal (closed and open) position were evaluated. The disk position was classified as: 1- normal position "45.7%", with anterior disk displacement (ADD) 2- with and 3- without reduction (DDwR: "27.9%", DDwoR: "26.4%"). The angulation between the Frankfurter horizontal plane and the posterior slope of the articular eminence was analyzed with a software program (OsiriX Dicom Viewer). Asymptomatic side of the patients was also evaluated. One-way Anova and student-t tests were used for the statistical analysis.

**Results:** There was no statistically significant difference between articular eminence inclinations in normal joints, DDwR and DDwoR (50.65 ± 10.68, 50.75 ± 10.22 and 46.93 ± 9.67 respectively), (p = 0.071). The disk position of the patients with DDwoR was statistically significant compared with normal patients and patients with DDwR (88.93 ± 17.16, 14.45 ± 10.80 and 60.96 ± 22.45 respectively), (p = 0.001).

There were no statistically significant gender differences regarding the angle of the disk and articular eminence.

**Conclusions:** Although articular eminence inclination appears not to be directly related with the development of DD based on the findings of this studied population, it has been observed that the steepness of the articular eminence is decreased and leads to the flattening in the joints with DDwoR as a result of degenerative changes.

**P594**

**Prevalence of Dental Caries and Periodontal Disease in Children in Latvia in the Period of 10 years**

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**Aim:** To assess prevalence of dental caries, periodontal diseases in children at the age of 12 in Latvia in the period of 10 years.

**Materials and methods:** The studies were carried out in 2001 and 2011. In 2001 were examined 1876 children and in 2011 – 5448 children. The studies were approved by the RSU Ethics Committee. Oral health assessment was performed using portable dental chairs with standard lights, dental mirror, a blunt probe and a periodontal probe. In order to assess caries the DMFT index was used. Periodontal conditions were assessed using CPI TN.

**Results:** The mean DMFT in 2001 was 5.03, DMFS – 7.38 and in 2011 – 3.35 and 5.11. In 2001 the largest component of DMFT formed caries (DT – 2.93) and filled teeth (FT) – 1.96. In 2011 the largest component of DMFT was formed by filled teeth (FT – 2.14) and caries (DT – 1.17). In 2001 study 56.93% of the examined children had healthy periodontal condition, gingival bleeding – 41.2%, dental calculus – 1.87%. In 52.22% of the examined children in 2011 had healthy periodontal tissue, but gingival bleeding was detected in 42.3% of the children, respectively. Dental calculus was found in 5.26% of the children.

**Conclusions:** 1 In accordance with WHO data, the prevalence of caries among 12-year-old children in Latvia shows an average score.
2. The largest part of DMFT index structure comprises filled and decayed teeth.
3. Gingival bleeding is the most common periodontal pathology in 12-year-olds in Latvia.

P595
Clinical Epidemiological Analysis of Carabelli, Paramolar Tubercles in Turkish Population
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Individual teeth vary remarkably in size, form, root shape, cusps. These characteristic differences occur not only among individuals, more importantly, among populations. Aim of this study is to analyse the prevalence of carabelli and paramolar tubercles in Turkish population according to age, gender, ethnic background and genetic predisposition.

Materials and methods: In this study, 145 patients (47 male, 98 female) in between age of 15–65 (mean age 34.70 ± 10.81 year old) were analysed clinically according to the presence of carabelli and paramolar tubercles in molar teeth. Gender, date of birth, homeland and any family member having company during this dental visit were asked to patients and marked on questionnaire forms. Also, dental examinations of these patients were done for detecting carabelli and paramolar tubercles in the maxillary and mandibulary molars. All data was statistically analysed by SPSS 15.0 programme, Chi-Square and Fisher’s Exact Chi-Square tests.

Results: Carabelli tubercles were determined in 44.1% (n:64) of the cases. Fifty percent (n:32) of carabelli tubercles were bilateral. Paramolar tubercles were determined in 6.9% (n:10) of the cases. Thirty percent (n:3) of paramolar tubercles were bilateral. Eight percent (n:8) of paramolar tubercles were detected in mandibula instead of maxilla. The frequency of paramolar and carabelli tubercules according to gender, ethnic background and genetic predisposition were not statistically significant (p > 0.05).

Conclusions: Paramolar tubercles can be noticed unexpectedly on the mandibulary molars instead of maxillary molars as well. More researches needed to detect this difference among populations to understand the role of genetic factors.

Theme: Preventive Dentistry: Orthodontics

P596
Dental Arch Dimensions in Yemeni Aged between 10 and 15 years
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Purpose: To assess the dental arch dimensions of Yemeni children aged (10–15) years, which is important to clinicians in orthodontics.

Methods: The sample was divided in to two groups, mixed dentition group aged (10–12) years divided into normal occlusion group (50 females,50 males) and class I with anterior dental crowding group (50 females, 50 males). Permanent group aged (13–15) was divided into normal occlusion group (50 females, 50 males) and class I with anterior dental crowding group (50 females, 50 males). Studying models form the upper and lower arches were constructed and evaluated to for upper and lower arches measurements by study models by scanner, digitizing and analyzing the data by a software program. Thirteen linear distances were utilized, which represented the dental arch width, length, segmental and palatal measurements.

Result and conclusion: The study found greater mean values for most of maxillary and mandibular arch dimension than class I with anterior dental crowding group in both mixed and permanent dentition. In the mixed dentition females and males, there is no significant difference in the majority of the measured dental arch dimensions. However, most of dental arch widths, and arch perimeter showed a significant difference between females and males. In permanent dentition, while no significant difference between females and males in arch lengths in both normal occlusion and class I with anterior dental crowding.

P597
Treatment of a Malocclusion Class III Associated with Open Bite with GEAW
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Introduction: The Class III with open bite malocclusion is difficult to correct, often involving the need for orthognathic surgery. In these anomalies, the position and inclination of the occlusal plane are particularly affected by posterior occlusal vertical dimension. Thus, when the occlusal plane is more horizontal, a malocclusion of class III can develop due to anterior rotation of the mandible. The elimination of the discrepancy and the reconstruction of the occlusal plane should be the key objectives in the treatment of this anomaly.

GEAW (Gum Metal edgewise archwire therapy) is an evolution of MEAW technique, by using Gum metal, a superelastic alloy, that can be bended.

Case: The patient is a young adult woman, with a Class III skeletal pattern and skeletal open bite, dolicho-facial, and with maxillary and mandibular crowding. She was orthodontically treated using the GEAW technique.

Orthodontic treatment with GEAW allowed to correct a complex malocclusion, without orthognathic surgery. It was observed, beyond the correction of occlusion, an improvement in the profile and facial aesthetics.

Conclusion: Class III with open bite malocclusions are usually quite complex and often need to be treated using orthognathic surgery. The control of the occlusal plane allows us to deal properly with this type of malocclusion, attaining stability, without using orthognathic surgery, when the facial profile is favorable. The use of Gum Metal facilitates orthodontic treatment with the MEAW technique because it eliminates the need of complex loops.
P598
The Effects of Pluronic and VEGF Applications on Bone Formation in Interpremaxillary Suture During Orthodontic Sutural Expansion by using CBCT
Hilal Karaman et al.

The aim of this experimental study was to evaluate the effects of Pluronic and VEGF on bone formation in response to expansion of the interpremaxillary suture in rats by using Cone Beam Computed Tomography (CBCT).

Materials and methods: Thirty-six male, 50- to 60-day-old Wistar rats were divided into four equal groups (control and experimental). Both groups were subjected to expansion for 5 days, and 50 cN of force was applied to the maxillary incisors with helical springs. The retention period lasted for 10 days. Experimental groups were treated with single-dose of Pluronic, VEGF and Pluronic+VEGF in the mid-palatal suture locally and nine control animals received physiologic saline solution. The mean bone density values in hounsfield unit (HU) of the newly formed bone were recorded using Mimics 10.1 image analysis software (Materialise NV, Leuven, Belgium). Wilcoxon signed ranks test was used for statistical evaluation.

Results: Significant differences were found between experimental groups and control group. New bone density values showed higher values in the Pluronic (p = 0.008, 1.21-fold), VEGF (p = 0.038, 1.11-fold), Pluronic+VEGF (p = 0.011, 1.35-fold) than the control.

Conclusion: Bone radiological measurements revealed that bone architecture in the experimental groups was improved and positive effects on early phase of bone regeneration in the premaxillary suture in response to expansion and may be beneficial in routine maxillary expansion procedures.

P599
Prediction of Lower Third Molar Impaction Using Lateral Cephalometric Radiographs
Loredana Golovcencu et al.

Aims: This study was designed to investigate the reliability of lateral cephalometric films measurements regarding the risk of third lower molar impaction in adolescents who undergone orthodontic treatment.

Materials and methods: The study sample consisted of 78 adolescent orthodontic patients divided into nonextraction treatment group and lower first premolars extraction treatment group. Standardized lateral cephalometric radiographs were taken for each patient before and after orthodontic treatment. On lateral cephalometric films we measured the available space for lower third molar eruption, the angle between the third molar long axis and the mandibular plane and the angle between the tangent to the occlusal face of the lower third molar and the palatal plane. Comparative and correlative analysis were performed between the groups.

Results: There was a 16.7% increase in lower third molar chances for eruption post orthodontic treatment in the nonextraction group, comparative to 14.2% in the extraction group considering the available distal space. The angle formed by the long axis of the tooth with the mandibular plane increased with 5.84° in the extraction group and decreased with 3.45° in the nonextraction group at the end of the orthodontic treatment. The angle formed by the tangent to the occlusal face of the lower third molar with the palatal plane decreased with the same amount in both groups.

Conclusions: Lateral cephalometric radiograph is a reliable investigation for lower third molar prediction and the orthodontic treatment with or without first lower premolar extraction has little or no influence on third lower molar eruption.

P600
Camouflage Therapy in an Class II Patient with Extraction of Maxillary First Premolars
Hatice Ademoglu et al.

Aim: To show the results of orthodontic treatment of skeletal and dental class II malocclusion in an adult patient.

Subject and methods: A 17 year old female with an unpleasant dental aesthetics, increased overjet and minimum crowding in the maxillary and mandibular arch. Pretreatment examination showed that she was in the permanent dentition stage, the molar relationship was full cusp class II on the right side and half cusp class II on the left side, the maxillary and mandibular incisors were proclined, overjet was 9 mm and overbite was 1 mm. Treatment started with extraction of the maxillary first premolars to allow space for the reduction of the overjet, upper and lower fixed appliances were used. Extra-oral traction was used as a part of treatment to reinforce the posterior anchorage. The total orthodontic treatment time was 28 months.

Results: At the end of treatment an optimum functional occlusion, aesthetic smile and facial profile was achieved.

Conclusion: In adult patients who have a moderate skeletal class II malocclusion camouflage therapy is commonly used and satisfactory aesthetic and functional treatment outcomes are achieved.

P601
Prevalence of White Spots in First Molars of Orthodontic Patients
Celjana Toti et al.

Aims: To investigate the prevalence of white spots in first molars of orthodontic patients.

Materials and methods: The study sample consisted of 78 adolescents with orthodontic treatment divided into nonextraction treatment group and lower first premolars extraction treatment group. Standardized lateral cephalometric radiographs were taken for each patient before and after orthodontic treatment. On lateral cephalometric films we measured the available space for lower third molar eruption, the angle between the third molar long axis and the mandibular plane and the angle between the tangent to the occlusal face of the lower third molar and the palatal plane. Comparative and correlative analysis were performed between the groups.

Results: There was a 16.7% increase in lower third molar chances for eruption post orthodontic treatment in the nonextraction group, comparative to 14.2% in the extraction group considering the available distal space. The angle formed by the long axis of the tooth with the mandibular plane increased with 5.84° in the extraction group and decreased with 3.45° in the nonextraction group at the end of the orthodontic treatment. The angle formed by the tangent to the occlusal face of the lower third molar with the palatal plane decreased with the same amount in both groups.

Conclusions: Lateral cephalometric radiograph is a reliable investigation for lower third molar prediction and the orthodontic treatment with or without first lower premolar extraction has little or no influence on third lower molar eruption.

Conclusions: Lateral cephalometric radiograph is a reliable investigation for lower third molar prediction and the orthodontic treatment with or without first lower premolar extraction has little or no influence on third lower molar eruption.
Aim: The aim of the study was to evaluate the prevalence and distribution of white spots in first molars in patients after debonding compared with the patients in need for orthodontic treatment.

Methods and materials: Sample size n = 24 patients scheduled for fixed orthodontic treatment were selected as control group (A) and n = 22 patients finished 2 year fixed orthodontic treatment were selected as study group (B). The same GIC cement was used to fix molar bands. The age distribution was 12–18 years old. Written permission received from the parents was part of the dental chart. The buccal surfaces of the first molars in each quadrant were examined for the presence of white spots in both groups.

Hi-square statistical test was used to analyze the differences between groups.

Results: The number of white spots in group A was 10 (10.4%) and in group B was 15 (17%) with a statistically difference between them (p = 0.041). The distribution of white spots for group A was 4 (8.3%) on maxillary molars and 6 (12.5%) on mandibular molars without any differences (p = 0.063). The distribution of white spots for group B was 6 (13.6%) on maxillary molars and 9 (20%) on mandibular molars, with a statistically difference between them (p = 0.039).

Conclusion: The results showed a significant higher prevalence of white spots in group B which emphasizes the influence of orthodontic appliances in increasing white spots. The number of white spots was higher in mandibular molars than in maxillary molars.

Aim or purpose: The aim was to test the hypothesis whether a change in the sagittal position and the transverse dimension of the dental arches in Class II division 1 patients varied according to the facial type.

Materials and methods: Lateral cephalograms of 111 Class II division 1 patients were divided into 3 groups (hypodivergent, normodivergent and hyperdivergent). The inter-canine and molar widths were measured on study models using a digital caliper (Mitutoyo, Japan). The mean of all parameters were compared using ANOVA followed by post-hoc test.

Results: A statistically significant difference (p < 0.001) was noted in the mean Pog-Na Pp of the hyperdivergent group and mean SNA and SNB angles between the groups.

Conclusion: The sagittal component was the only factor that varied between the facial types. There was no difference in the transverse dimension between the groups.

Introduction: Orthodontics treatment planning is an effort of to understand and to solve the dento-facial problems. Development of imaging technologies serves the opportunity of to evaluate real three dimensional anatomical structures on third dimension, virtually. Pal 3D is a new cephalometric analysis system based on multiplanar assessments of hard and soft tissues on cranio-facial reconstructions.

Case: In this report, diagnostic capabilities of the comprehensive dento-facial analysis system including specialized landmarks, reference planes and measurement parameters were presented with different clinical studies.

Orthodontic Treatment of Maxillary Deficiency of Cleft Lip and Palate Patient at Pubertal Stage: Case Report
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Aim: Moderate to severe occlusal discrepancies and Dentofacial Deformities in adolescents usually require combined orthodontic treatment and Orthognathic Surgery to obtain optimal, stable, functional and esthetic results. Therefore Slow Maxillary Expansion is suggested for the Cleft Lip and Palate Patients before orthodontic treatment. The aim of this study is to present the treatment of a 12-years-old female patient by slow maxillary expansion by removable appliance with Bertoni screw in the middle followed by fixed appliances.

Subject and methods: The 12-year old female has applied to our clinic due to aesthetic and feeding problems. According to the clinical and radiographic evaluation of the patient, maxillary transverse and sagittal deficiencies were inspected. The molar relationship was Class I and there were no canine relationship, no overbite and negative overjet. The patient was skeletaly Class III. The treatment plan was to perform slow maxillary expansion combined with fixed orthodontic treatment.

Results: The treatment duration was 36 months and at the end of the treatment wide maxillary satisfactory dental relationships were achieved.

Conclusion: Functional occlusion along with aesthetic smile was obtained with slow maxillary expansion and orthodontic treatment in the mouth of a girl at pubertal age with maxillary deficiency Class III skeletal deficiency.

Cleftocranial Dysplasia: A Case Report
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Introduction: Cleftocranial dysplasia (CCD) is a skeletal dysplasia characterized by delayed closure of the cranial sutures, hypoplastic or aplastic clavicles, and multiple dental abnormalities. The most prominent clinical findings are abnormally large, wide-open fontanels at birth that may remain open throughout life; mid-face hypoplasia; abnormal dentition, including delayed eruption of
secondary dentition, failure to shed the primary teeth, supernumerary teeth with dental crowding, and malocclusion.

**Case:** A 20 years old male patient was referred to our clinic because of his missing teeth. Patient’s height was 148 cm and in the physical examination it was determined that he had long neck and narrow and low shoulders. The patient was able to join his both shoulders in front of the body depending on the aplasia of the clavula. The patient mentioned that his father and little sister had the same orthopedic problems. Extraoral examination showed brachiocephalic head and face, low nasal bridge, wide and prominent forehead. The bones of the midface were too small leading to an appearance like prognathism. Intraoral and radiographic evaluation revealed persistent deciduous teeth and 16 of the permanent teeth were impacted. Some of the impacted teeth were still at the germ stage.

**Conclusion:** The clinical findings of CCD are often undiagnosed although it is present at birth. It will be diagnosed later in life by incidental findings by physicians or dentists. Thus a multidisciplinary approach can help the patient in proper mastication and esthetics and therefore fulfilling the functional need of the patients.

**P606**

**The Three-Dimensional Evaluation of Nasal and Pharyngeal Airway after LeFort-I Maxillary Distraction**

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**Aim:** Distraction osteogenesis (DO) is a method of enhancing bony deficiencies of the hypoplastic maxilla. In the study, it was aimed to evaluate the skeletal, dental, oropharyngeal airway and nasal passage volume changes that occur after LeFort-I maxillary DO (LeFort-I MDO).

**Materials and methods:** The LeFort-I MDO group consisted of seven male patients (mean age: 25.5 years) with severe skeletal Class-III anomalies related to maxillary retrognathic, excessive increased negative overjet (mean: 11.43 mm) with anterior and/or posterior cross bite. Lateral cephalograms, photographs, dental casts and computed tomography were obtained and analyzed at presurgery and more than 6 months (mean: 7.1 months) postsurgery. All CT records were transferred to the computer with the software SimPlant (Materialise, Belgium) to obtain the three-dimensional virtual models. On virtual models, maxillary complex, nasal cavity and pharyngeal areas were segmented separately due to the comparison changes before and after the LeFort-I MDO.

**Results:** After the LeFort-I MDO, the maxilla was repositioned anteriorly average 9.5 mm (7.5–15.1 mm) on the sagittal direction parallel to the base of the cranium. As a result of the maxillary advancement, the mean increases of the volume of the nasal cavity (mean: 36.36 mm3) and the volume of the pharyngeal area (mean: 2010 mm3) were statistically significant compared to the preoperative volumes (p = 0.018).

**Conclusion:** Orthognathic surgery is performed to alter the shape of the jaws to improve dental occlusion stability, improve temporomandibular joint function, open the oropharyngeal airway, and improve the patient’s facial proportions. In all patients, LeFort-I MDO created a significant increase in nasal and pharyngeal passage volume.
Aim: The aim of the study was to evaluate Histidine161Arginine (H161R) polymorphism of IL-17F gene and Arginine381Glycine (R381Q) polymorphism of IL-23R gene in patients with different periodontal disease and the associations of these polymorphisms with periodontal clinical parameters.

Methods and Materials: Ninety periodontal healthy, 90 patients with chronic periodontitis and 57 patients with aggressive periodontitis were included in the study. After all clinical periodontal measurements including probing depth (PD), clinical attachment level (CAL), plaque index (PI) and gingival index (GI) had been recorded, initial periodontal therapy including scaling and root planing, oral hygiene motivation were performed. Before the treatment, DNA was isolated from venous blood samples from each patients and genotype analysis were made for single nucleotide polymorphism.

Conclusion: The comparison of allelic, genotypic frequency of the IL-17F Histidine161Arginine (H161R) ve IL-23R Arginine381Glycine (R381Q) polymorphisms revealed no significant differences between the periodontal healthy and overall group with periodontitis. In conclusion, it was suggested that there was no association between the IL-17F (H161R) and IL-23R (R381Q) gene polymorphisms and patients with periodontal disease in Turkish population.

P609
Correlations between the Periodontal Modifications and the Oxidative Status on Periodontal Disease Patients
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The purpose of the study: Our study was centered on the comparative research of enzymatic and non-enzymatic oxidative status mediators in the crevicular fluid on chronic and aggressive periodontitis patients, compared to periodontally healthy subjects.

Methods: The study was conducted on 42 patients. They were divided in three study groups: chronic periodontitis subjects, aggressive periodontitis patients and periodontally healthy subjects. On marginal periodontitis patients, associated or not with systemic diseases, we initially collected gingival crevicular fluid (GCF) as biologic material.

Results: The values of plasmatic triglycerides were higher in the patients of the experimental group, comparatively with the subjects of the control one (+39%), yet no difference has been registered for HDL cholesterol, while the mean plasmatic cholesterol levels and the LDL cholesterol levels in subjects suffering from periodontitis were significantly higher, with approximately 8 and 13%, comparatively with the control. The frequency of hypercholesterolemia in the first group of subjects was approximately double vs. the control.

Conclusions: The pathological levels of triglycerides were about 6.5 times more frequent in periodontitis, comparatively with the subjects of the control group, yet no difference was observed for the HDL cholesterol level.

P610
Periodontal Alteration and Correlation with the Plasmatic Levels of Lipides
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Scope of the study: evaluation of the extent of periodontal alteration, correlated with the plasmatic levels of cholesterol and of the metabolism time of plasmatic lipides.

Methods: The patients forming the experimental group were recruited sequentially, along 6 months, among those having addressed the private dental office for routine examinations. The experimental group included 39 patients affected with periodontal diseases, while the control group – 40 patients with ages between 50 and 60 years. There followed measurement of the jejun plasmatic lipids and of glucose concentrations from blood.

Results: The values of plasmatic triglycerides were higher in the patients of the experimental group, comparatively with the subjects of the control one (+39%), yet no difference has been registered for HDL cholesterol, while the mean plasmatic cholesterol levels and the LDL cholesterol levels in subjects suffering from periodontitis were significantly higher, with approximately 8 and 13%, comparatively with the control. The frequency of hypercholesterolemia in the first group of subjects was approximately double vs. the control.

Conclusions: The pathological levels of triglycerides were about 6.5 times more frequent in periodontitis, comparatively with the subjects of the control group, yet no difference was observed for the HDL cholesterol level.

P611
Periodontal Status as a Risk Factor for Male Infertility
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Background and aim: An association has been demonstrated previously between periodontal diseases and various systemic conditions including pre term low birth weight babies, coronary heart disease and other systemic diseases. A possible role of dental infection in male infertility has also been suggested.

aim of the present study is to examine the association between fertility parameter and periodontal status of men attending in vitro fertilization (IVF) clinics.

Material and methods: The study population consisted of 27 men attending Dallah Hospital Infertility Clinic and King khaled hospital for sperm analysis before homologue semen insemination or IVF. The quality of sperm was assessed according to WHO criteria and fertility is classified as either fertile or sub-fertile, according to three main parameters: sperm cell concentration, sperm cell motility and sperm cell morphology. and all results were recorded.
Clinical periodontal parameters recorded were gingival index, plaque index, PD, gingival recession and clinical attachment loss. Were identified as healthy, moderate or severe chronic periodontal disease. 

**Results:** ANOVA multivariate analysis and Yates $\chi^2$ test used for examining a possible association between the tested periodontal and fertility parameters.

Patients were diagnosed as gingivitis (3.7%), moderate periodontitis (81.5%) and severe periodontitis (14.8%). According to semen analysis they were classified as normospermia (25.9%), oligozoospermia (22.2%), azoospermia (51.9%). High number of sites with deep periodontal pocket, CAL and number of missing teeth were significantly associated with sperm submotility.

**Conclusions:** These findings point to a possible association between male infertility, diminished semen quality and periodontal infections in men attending IVF Clinics.

**P612**

**Relationship between Dental-Periodontal Conditions and Self-Reported Reflux Index: Early Results**

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**Aim:** Gastroesophageal Reflux Disease (GERD) and Laryngopharyngeal reflux (LPR) are common community health problems which are known to affect the oral cavity. Subjective assessment of the symptom severity in the patients with GERD and LPR is possible with self “Reflux Symptom Index” (RSI). In this study, the possible relationship between dental/periodontal conditions and RSI scores were evaluated.

**Methods:** A preliminary prospective cross sectional study was performed with 124 dental outpatients (72 Female and 52 Male; aged between 18 and 62 years). Demographic and clinical variables and reflux symptom index (RSI – a nine item and 45-point scale questionnaire) score were evaluated. Dental and periodontal conditions were evaluated with DMFT index (decayed, missing, filled teeth) and Community Periodontal Index (CPI) scores. The correlation between variables in sub grouped patients and RSI scores (normal: RSI $\leq$ 13, abnormal: RSI $> 13$) were statistically examined.

**Results:** RSI subgroups were similar for DMFT and CPI scores ($p < 0.05$). In addition, RSI scores were not correlated with DMFT and CPI scores.

**Discussion:** Self-reported RSI merits further investigation before a conclusion to be declared to be suitable for the dental and periodontal evaluation of the patients with GERD and LPR.

**P613**

**Prevalence and Serotype Distribution of Aggregatibacter Actinomycetemcomitans in Non-Periodontitis Subjects**

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**Aim:** To determine the prevalence and serotype distribution of *Aggregatibacter actinomycetemcomitans* in non-periodontitis subjects.

**Materials and methods:** Systemically healthy non-periodontitis 94 dental students who had not use of antibiotics within the last 3 months and not received any form of periodontal therapy within the last 6 months were included in the study. Pooled subgingival microbiological samples were collected from each subject with sterile paper points from 4 first molars and 4 central incisors. All samples were tested for the presence of *A. actinomycetemcomitans* through PCR analysis of the 16S rRNA genes in DNA extracted from the samples. *A. actinomycetemcomitans* isolates were serotyped using various genes specific to the different strains of the bacterium. To determine the specific serotype, each DNA sample was subjected to three different PCR assays for serotypes a/e, b/c/d.

**Results:** Of the 94 samples that were tested, 43 (46%) were positive for *A. actinomycetemcomitans*. Among the 43 *A. actinomycetemcomitans* -positive samples, the serotype was identified only in 31 of the samples. Twenty-five were positive for *A. actinomycetemcomitans* serotype a (81%), 1 for serotype b (3%), 1 for serotype c (3%), and 4 for serotype f (13%), while serotypes d and e were undetectable.

**Conclusion:** The large percentage of subjects exhibiting *A. actinomycetemcomitans* serotype a suggested a strong association between non-periodontitis Turkish individuals and serotype a.

**P614**

**Interface (Lichenoid) Oral Mucositis**

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**Background:** In literature, several studies have been reported that many systemic disorders shows their symptoms in oral mucosa. They may be manifested pathologically changed structures caused by organic or psychological factors. Early symptoms which occur within the oral cavity may emerge with diseases related to our blood serum levels, gastrointestinal or mental system. Chronic stomatitis is a condition characterized by chronic, painful oral lesions. In this case report we present possible ethyological factors of oral mucosal manifestations such as interface oral mucositis.

**Case:** A 28 year old female patient who was suffering from pain and burning sensation of lesional oral mucosa referred to The Department of Periodontology. She had life event psychological stress, her diet was insufficient and these complaints have been increased for 3 months. She has been taken hypothyroid treatment for 3 years. Intraoral examination revealed white reticulang lesions under her tongue and desquamative, erythematous areas at her...
posterior mandibular keratinized gingiva. She was periodontally healthy. Histopathology of keratinized gingival lesion revealed lichenoid, eruptive stomatitis as interface mucositis. Biochemical analysis showed decreased B12 vitamin levels. In treatment, her new toothpaste has been changed as a possible contact stomatitis diagnosis and drug administration of vitamin B complex has been recommended. After 2 weeks, all symptoms were dissappeared. **Conclusion:** In differential diagnosis, clinicians should consider multiple ethylogical factors such as malnutrition, stress and local factors including toothpaste, oral rinses and gums may have a role in occurance of oral mucosal lesions.

**P615**

**Gingival Health Assessment Using Two Gingival Indices**

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**Aim:** To enable comparison of specific groups of the population, at a certain time, to support the definition and control of risk factors and to evaluate the effectiveness of periodontal treatment, gingival health and its level should be determined as accurately.

**Materials and methods:** In 10 patients were collected values of the two indexes for mandibular anterior teeth, only vestibular area. Patients were selected that had not lack of teeth in the mandibular anterior area. They were evaluated for both indices: Löe-Silness gingival index and gingival bleeding Mühlerman index, for each individual tooth and for the patient in total.

**Results:** Both indices were compared between them on each patient. Sensitivity of gingival index was only with a value below the value assessment of gingival bleeding index.

**Conclusions:** Only experience, care and attention are grounds to take into consideration subjective signs such as edema and gingival color, which are basic elements gingival index assessment. At the initial appearance of inflammation, bleeding is the determining factor and the second sign after the increased gingival fluid. We can not think of mathematical relation between the two indices, but both must be used simultaneously for statistical evaluations of the same patient.

**P616**

**Conventional Versus Laser-Assisted Therapy with Aggressive Periodontitis**

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**Aim:** To evaluate tissue response in aggressive periodontitis (AgP) after conventional and conventional supplemented with laser-assisted therapy.

**Methods and materials:** This study included 50 subjects with AgP, aged 10–24 year, which were divided into two subgroups. First subgroup 25 subjects treated only with conventional therapy (CP) and second subgroup of 25 subjects which were treated with laser assisted therapy (CP-LA). Low-level diode laser (630–670 nm, 1.875 J/cm) was applied, each sextant for 4 min, Scorpion C-405 7A. The control group consisted of 20 individuals, aged 13–24 years, without signs of periodontal disease. Gingival tissue biopsies were obtained from the controls and from the study group before and after conventional and with laser assisted treatment. Tissue specimens were embedded in paraffin and cryostat procedures were performed.

**Results:** Subject with AgP revealed heterogeneous inflammatory infiltrate with dense and less dense areas. Mean values for study group before treatment were 39.18 ± 14.02. For the first subgroup mean values ranged 35.92 ± 14.02, and mean values for the second subgroup were 35.01 ± 13.25. Qualitative analysis in study group after conventional witout and with lasser assistene revealed insignificant values of mononuclear and plasma cells and Russell bodies.

**Conclusion:** Laser application did not induce quantitative nor qualitative changes in the gingival tissue inflammatory infiltrate in study group. On the basis of our findings we suggest that low level laser assisted therapy does not proof to be efficient in the treatment of aggressive periodontitis.

Key words: aggressive periodontitis, low-level diode laser, gingiva, periodontal therapy.

**P617**

**Free gingival Graft Dimensional Changes in the Anterior Mandible**

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**Background:** There is no absolute minimum amount of attached gingiva required for gingival health to be maintained. However, there are several clinical situations which augmentation with autogenous grafts might be indicated. The aim of this study was to evaluate shrinkage of free gingival graft (FGG) dimensions during the healing period of 3 months and impact of keratinised tissue width gained by FGG on gingival inflammation parameters.

**Materials and methods:** Thirty localized recessions of Miller Class I to II were treated with FGG in 30 systemically healthy and non-smoker patients. Plaque index (PI), gingival index (GI), probing depth (PD), clinical attachment level (CAL), keratinized tissue (KT), vertical recession (VR), horizontal recession (HR) and FGG dimensions were assessed baseline and 30, 90 days postoperatively.

**Results:** At 3 months, non-significant alterations of PI, GI, PD and CAL were observed. KT increased significantly from baseline (p < 0.01) at days 30, and 90. Horizontal graft shrinkage was not statistically significant compared baseline to 30 days. However, vertical graft reduction was statistically significant at same
time-points. Calculated graft area was significantly reduced during the study period at all time-points compared to the baseline (p < 0.001).

Conclusion: FGG procedure is quite practical to get prominent increase of keratinised tissue width. Vertical graft shrinkage seems to affect the clinical outcomes of the FGG procedure.

Theme: Preventive Dentistry: Public Health

P618

Effect of New Disinfectant to Biofilm in Dental-Unit-Water-Line
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Aim: The antibacterial effect of new disinfectant, a test mixture containing sodium percarbonate, to heterotrophic organisms forming biofilm was evaluated.

Materials and methods: Microplate assay: Test bacterial strains isolated from dental-unit-water were inoculated to R2A broth in each well on a microplate. After 5-day-incubation at room temperature, the wells were washed and treated with the disinfectant. Bacterial survival was evaluated by fluorescent increment of Alamar-Blue, a detector of REDOX activity.

Disinfectant test using a water line tube of a dental unit: A water line tube with biofilm was taken from a dental unit clinically used and cut into 5 mm-fragments. Each of the tube fragments was immersed into the disinfectant and then cultivated for up to 10 days in R2A broth to detect bacterial survivors.

Results and discussion: A 5 min treatment with 3.3% of disinfectant solution was effective to biofilm formed on microplate. However, for disinfection of the tube fragments, this condition seemed to be insufficient for complete killing of the bacteria. No bacterial growth was detected after 30 minutes-treatment. Therefore change of treatment time and/or disinfectant concentration should be considered.

Conclusion: The disinfectant was effective to both model biofilms, on microplate and the “native” biofilm formed on the inner surface of a dental unit tube. The optimum condition for disinfection while minimizing the influence to dental unit material should be established.

P619

Oral Health Knowledge and Practice among Pilgrims Visiting Medina
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Introduction: Medina is the second holiest city in the Islamic religion after Mecca. Millions of pilgrims visit the city each year from different parts of the globe for spiritual reasons.

Aims: 1 To determine the oral health knowledge and practice amongst pilgrims visiting Medina.
2 To compare the knowledge and practice amongst the different pilgrims.

Methods: This was a cross sectional descriptive study. The pilgrims were divided into six groups; Saudi Arabia, other Arab countries, Indian subcontinent, Turkey, Iran and Europe and the questionnaire was translated into six languages. The questionnaire was administered by the interviewers directly and no names were recorded. The data was analyzed using the SPSS 15 statistical package.

Results: A total of 600 pilgrims were included in the study; 340 (57%) males and 260 (43%) females and the average age was 36 years old. Of these, 42% reported brushing their teeth twice daily using a toothbrush and toothpaste. Regarding the knowledge about the benefits of fluoride in preventing dental caries, 80% Iranians knew the correct answer. The majority of respondents (70%) reported to visit the dentist only when necessary.

Conclusion: The overall knowledge regarding oral health was acceptable. In general, respondents from developed countries showed a greater level of oral health knowledge compared to the others. Pilgrims from Iran showed the greatest knowledge regarding oral health behavior and practices.

P620

Efficiency of Different Toothpastes for Children in Improving Gingival Health
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Objectives: Our previous experience shown that school supervised toothbrushing program is effective for achievement of good oral hygiene in children, however, there are fewer reports on the effectiveness of different toothpastes. The aim of this study was to evaluate oral hygiene and gingival health in 6–7-year old children in 9-month program of supervised toothbrushing with fluoride – containing and fluoride-free toothpastes.

Methods: Ninety-eight children in one school (A) were assigned to brush their teeth with a fluoride – free toothpaste; 110 children in other school (B) – with a F-1000 ppm toothpaste daily in schools under supervision of teachers.

Results: The initial level of OHI-S in “A” was 1.74 + 0.37 SD; in “B” – 1.71 + 0.32 (p > 0.05). The mean GI were 0.78 ± 0.39 and 0.76 ± 0.30 (p > 0.05) in “A” and “B” groups correspondly. After 9 months OHI-S was improved by 53% in “A” and by 50% in “B” to levels of 0.82 ± 0.20 and 0.86 ± 0.36 correspondly (p < 0.01). The mean GI had decreased by 40% to level of 0.47 + 0.11 in “A” and by 43% to level of 0.43 + 0.38 in “B” group (p < 0.01).

Conclusions: Toothbrushing with fluoride-containing and fluoride-free toothpastes were equally effective in improvement of oral hygiene and gingival health of young school children for the 9-months period of the supervised oral hygiene trial in schools.
Aim: The aim is to present results of the questionnaire survey concerning MSDs conducted among dentists in the Czech Republic.

Methods: Dental practitioners filled in the questionnaires during educational events from November 2010 to September 2011. The questionnaire consisted of three parts. The first part included general information about the respondents, the second part concerned the characteristics of workplace and the last part involved the prevalence of MSDs. Collected data were statistically analysed.

Results: A total of 581 (72.6%) out of 800 questionnaires were returned. A total of 96.9% (n = 557) of respondents stated at least one kind of MSD regardless its intensity in the last 12 months. 30.6% (n = 176) of respondents identified their pain as mild. Middle or strong pain was declared by 66.3% (n = 381) of all respondents; by 69.3% (n = 287) of women and 58.4% (n = 94) of men. This difference between men and women was statistically significant (chi-square test, \( p = 0.012744 \)). Of the respondents with middle or strong pain 22.6% (n = 86) decreased their work load for MSDs during the last 12 months. Of the dentists with middle or strong pain 86.9% (n = 331) treated themselves by doing exercises, 48.6% (n = 185) by medicaments and 46.7% (n = 178) turned for help to a specialist. The most often MSDs were pain in cervical spine, back and shoulders.

Conclusions: The prevalence of MSDs is quite high among the dentists in the Czech Republic, mainly in women.

P622

Patients’ Oral Cancer Awareness and Perceptions of Oral Cancer Screening
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Aim: To assess dental patients’ oral cancer awareness, and attitudes towards having a screening with a direct visualization device.

Materials and methods: In this cross-sectional, descriptive study, a questionnaire consisting of 20 questions was administered to 50 dental patients aged eighteen and over. The first part of the questionnaire included questions about the socio-demographic features of the patients; the causes, signs and symptoms, diagnosis and treatment of oral cancer. After informing all the participants about the method, patients who accepted to do so, were examined using the direct visualization device. The second part of the questionnaire included questions on attitudes and feelings towards oral cancer screening.

Frequency distribution test was used in statistical analysis.

Results: Forty-four percent of the study participants had never heard of oral cancer. Smoking was the most frequently identified cause and ulceration was the most frequently identified symptom. Only eight percent of the study participants had heard of oral cancer screening with a direct visualization device but they would accept to be scheduled for follow-up (96%) or biopsy (84%) if a suspected lesion is detected.

Conclusion: Patients seem generally unaware of oral cancer and oral cancer screening but attitudes to screening were positive. We need to use this information to initiate public education programs for increasing oral cancer awareness and to facilitate early detection.

P623

Oral Hygiene Status, Awareness and Practices among Almajirs in Maiduguri
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Aim: To assess the oral hygiene status, awareness and practices among almajiris who constitute a large population of underprivileged children in northern Nigeria; about seven million (Moses. T Aluaigba, Circumventing or Superimposing Poverty on the African child?, Childhood in Africal 2009! Vol.1.No.1 pp19–24), as no such study has ever been carried out before in Nigeria.

Materials and methods: The study is an analytic observational study carried out over a period of 6 days, between the 6th-11th of February 2012 on a total of two hundred and sixteen (216) almajiris from four (4) randomly selected locations in Maiduguri. Each almajiri was administered a self-administered questionnaire by the researchers which consisted of biodata, demographic data, and sections to assess their oral hygiene status, awareness and practices, and dental examination was carried out. The questionnaire was analyzed using the standard package for statistical analysis for social sciences software (SPSS).

Results: The level of oral hygiene awareness among almajiris is poor, most of them use chewing sticks to clean their mouths and have poor oral hygiene.

Conclusion: Almajiris constitute a significant population of underprivileged children in northern Nigeria. Oral health awareness among them is poor because of lack of formal education. They mostly use chewing sticks because they can neither afford nor maintain toothbrushes and toothpastes and as such most of them have poor oral hygiene.

To improve their condition, it is recomended that the government improves assess to dental health services to the underprivileged. The fight against child destitution should also be improved.

P624

The Role of Salivary Bacteria at Diabetes Management
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Objectives: To assess the correlation between salivary bacteria and diabetes mellitus type2 (DM2) and obesity among patients with DM2.

Methods and materials: Baseline measurements from a prospective intervention study among DM2 patients (n = 186), Istanbul, were studied. The assessed clinical measures were streptococcus mutans, lactobacillus, number of teeth lost (maxilla), HbA1c, HDL, LDL and body-fat proportion. Patients having low number of Streptococcus mutans (<106) and lactobacillus (<106) were coded as “low salivary bacteria = 0”. Taking the target levels (HbA1c < 6.5%,...
high-density lipoprotein (HDL) >39 mg/dl, and low-density lipoprotein (LDL) <95 mg/dl as cut-points, respective variables were dichotomized as “favourable” and “unfavourable”. Descriptive statistics, frequency distributions, Chi-square tests and Factor analysis were applied.

Results: Most patients had low salivary bacteria (72%). The mean number of teeth-lost was 7.92 ± 6.04. Minority of patients had favourable diabetes-related measures [HbA1c (28%), LDL (30%)] except that a majority of patients reported favourable HDL (77%)]. The percentage of healthy body-fat proportions was low (37%). The patients with low number of salivary bacteria were more likely to keep their teeth (64%, p = 0.004). Those who had teeth-loss “below mean” were more likely to be in healthy body-fat range compared to those with “above mean” teeth loss (p = 0.048). Factor analysis revealed that those with high number of salivary bacteria were more likely to be in unhealthy fat-range and have high HbA1c.

Conclusions: The correlation between salivary bacteria and diabetes-related measures and obesity may underline that dentistry can play a major role in the prevention of further complications of DM2 and obesity by early diagnosis, with the use of salivary bacteria.

P625
Prediabets and type 2 Diabetes in Dental Patients: The Efficiency of Three Different Screening Approach
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Aim: The aim of this study was to determine the prevalence of type 2 diabetes, impaired glucose tolerance (IGT), and impaired fasting glucose (IFG) with using random finger prick plasma glucose (RFPG) test in dental patients, and to compare the results of RFPG with that of Finnish Diabetes Risk Score (FINDRISC) and clinical guideline.

Methods: Six hundred and thousand and forty-four dental patients without diagnosed diabetes, nonpregnant adults, and ≥20 years of age participated to study. The basic screening tool was random finger prick plasma glucose test. This test was performed for each participant. The participants were referred to a physician according to the results of RFPG, or were not. Additional data tools were FINDRISC and clinical guideline developed for the dental patients.

Findings: The prevalence of previously diagnosed diabetes, type 2 diabetes, impaired glucose tolerance (IGT), and impaired fasting glucose (IFG) in dental patients was 8.3, 3, 0.7, and 0.3%, respectively. In regression analyses, age (p < 0.01), a family history of diabetes (p < 0.001), obesity (p < 0.01), and waist circumference (p < 0.001) were determined to be risk factors for type 2 diabetes. The correlation analysis showed that there were significant positive correlation between FINDRISC and clinical guideline (p < 0.001), and were negative correlation between RFPG and the other screening methods (p < 0.001 for each).

Conclusion: Finger prick plasma glucose test (RFPG), FINDRISC, and clinical guideline developed for dental patients were able to identify type 2 diabetes and prediabetes in dental patients. However, we couldn’t conclude that they were completely successful screening methods and it could be useful in dental setting.

P626
Atmospheric Radon Concentration Measurements at New Dental Faculty Building in Isparta, Turkey
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Aim: Radon, a radioactive and carcinogenic gas, can accumulate in enclosed spaces. Since inhalation of radon is related to the aetiology of lung cancer, it is important to determine the indoor radon levels in homes and workplaces. The aim of this study was to assess annual equivalent doses taken by the staff due to presence of radon in the new faculty building at University of Süleyman Demirel in Isparta, Turkey.

Materials and methods: 36 E-ERM (Electret Passive Environmental Radon Monitor) devices were placed in couples at different locations including clinics, laboratories, radiology rooms and offices. Atmospheric radon measurements were performed at each location by using short-term E-ERM detectors for approximately 50 h measurement time in February 2013.

Results: The analyses of detectors revealed that radon levels varied between 6 and 229 Bq/m3 and the average concentration at the faculty was found as 58 Bq/m3. The average annual effective dose received in the building was estimated as 0.41 mSv/year.

Conclusions: Within the limitations of this study it was found that, the observed radon levels in the new dental faculty building were lower than 1000 Bq/m3 that is the limit level for working places determined by TAEK (Turkish Atomic Energy Authority). Furthermore, the average dose taken by the dental staff was found to be less than the action levels of ICRP (International Commission on Radiological Protection).

P627
Odontogenic Bacteremia: A Secondary Endpoint in Oral Care and Dental Treatments
Tsunumi University School of Dental Medicine

Objectives: To date, a primary endpoint of oral care and dental treatment is restricted within oral region. However, recent evidence indicated that the oral health and diseases affect to general health. So, we are trying to set a secondary endpoint in dentistry.
Methods: We set up a new preventive dentistry, 3DS (Dental Drug Delivery System) dental clinic for outpatients in our hospital. 3DS treatments were implemented to patients in order to prevent their odontogenic bacteremia.

Results: Evaluation of effect of 3DS treatments on prevention of odontogenic bacteremia were performed by ABI (ankle brachial pressure index) and baPWV. ABI is the ratio of the blood pressure in the lower legs to the blood pressure in the arms. Compared to the arm, lower blood pressure in the leg is an indication of blocked arteries (peripheral vascular disease or PVD). Pulse wave velocity (PWV), which is an index of arterial stiffness, was measured with form PWV/AVI (Colin/Omron, Japan). Arterial stiffness is one of the biggest predictors of coronary heart disease (CHD). We evaluated arterial stiffness by brachial-ankle pulse wave velocity (baPWV).

Conclusion: 3DS is a useful tool to prevent the damage of systemic blood vessel caused by everyday odontogenic bacteremia. A new preventive dentistry, 3DS dental clinic for outpatients will change the concept of dental office in the world.
Saturday, August 31, 2013
FREE COMMUNICATIONS SESSIONS 47–54

FC289
Reliability of YENangle and MVI as New Sagittal Dysplasia Indicators
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Introduction: In orthodontic diagnosis and treatment planning, the evaluation of the anteroposterior jaw relationship is an indispensable step. However, most of the anteroposterior parameters that were introduced have some limitations. The YEN angle and Mount Vernon Index (MVI) were developed as new cephalometric measurements to evaluate the sagittal relationship between the maxilla and mandible more reliably.

Aim of the work: Measure the mean and cut off points of YEN angle and MVI in an Egyptian population sample and to evaluate their reliability.

Materials and methods: Four hundred and fifty cases were selected, for each case a true standardized lateral cephalometric radiograph was done after written consent and approval from the Ethics Committee. These cephalograms were traced and ANB, Wits appraisal, AF-BF distance and Beta angle were measured. The enrolled cases were subdivided based on these parameters into skeletal Class I, II, and III. Then the YEN angle and MVI were measured for each radiograph. The data were collected, tabulated and statistically analyzed.

Results: Cases with YEN angle between 119 and 126 degrees and MVI between 4 and 8.5 mm had a Class I skeletal pattern. Cases with a YEN angle <119 degrees and MVI more than 8.5 mm had a skeletal Class II pattern. Those with YEN angle >126 degrees and MVI <4 mm had a skeletal Class III pattern. Both YEN angle and MVI were highly reliable.

Conclusion: The YEN angle and MVI can be added as an extra diagnostic measurements to help in diagnosing the skeletal pattern of the patients.

FC291
Face Driven Orthodontics
Khaled Samir Aboulazm
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Introduction: Face-driven treatment planning is unique in that the face and the smile are considered as a whole. Tooth movement and facial movement are both projected, resulting in the best overall result for the patient.

So What are today patients looking for? What can we, as orthodontists, provide to stand out from the crowd? The answer to both questions is very simple: LIFETIME ESTHETICS IN ADDITION TO FUNCTIONAL ADEQUACY. While optimizing function has always been the goal of orthodontic treatment, today’s patients want more than just straight teeth. The emerging paradigm in our field is a global esthetic approach with emphasis on patient-centered interaction that enhances a good occlusion, achieved either solely by orthodontist or in conjunction with a team of cosmetic dentists and prosthodontists.

Conclusions: Advanced modern orthodontic techniques provide solutions to effect an overall facial change, maximize esthetics and merge this with function providing the patients with top notch treatment outcome.
The Orthodontic Evaluation of Adolescent Celiac Patient
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Aim: Celiac disease is a common cause of malabsorption in infancy and childhood. Because of calcium malabsorption it has been accepted that celiac disease is related to skeletal diseases. Since the facial muscle activities have affects on the development of cranio-skeletal structures, the cephalometric values of celiac patients may differ from healthy individuals. The aim of this study is to evaluate the cephalometric radiographs and cast models of celiac patients compared with normal class I patient.

Material and methods: Cephalometric measurements of 45 celiac patients were matched with same age and gender Class 1 (ANB: 2 ± 2°) 45 patients' outcomes and analyzed. Angular and linear measurements were performed. Radiographs were digitized with Dolphin Imaging Orthodontics Software. Transversal width of each subject was measured on cast models. Statistical analysis were performed using SPSS V.11,5.

Results: IMPA, L1-NB(mm), L1-NB(°), U1-FH, U1-SN values were higher in the test group while Holdaway ratio, U1-L1 values were higher in control group. These outcomes might be due to the low density of the alveolar bone which cannot resist against the forward force of tongue during swallowing. SNA, ANB, Upper Lip-Eline values were higher in test group while Intermolar width, FMA, U1-NA(mm) were higher in control group. These results might be originated from narrow maxillary width of celiac patients causing forwarded location of A point moreover provoking clockwise rotation of the mandible. As a result, celiac patients appear to have different trends in the skeletal pattern and this might be due to low bone mineral density and bone-muscle functions during growth.

The Replacement of Missing Teeth on Adolescent Patients after Orthodontic Treatment
Edlira Baruti
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Aim: The preferred method for replacement of missing teeth on adolescent patients appears to be the implant retained crown following orthodontic treatment. At the end of the orthodontic treatment a temporary replacement may be necessary for several years while waiting for a patient to reach physical maturity. The majority of patients with missing teeth will wear some sort of removable appliance after their orthodontic treatment.

Material and methods: I projected a fixed space maintainer with the replacement teeth attached on it. At the end of the orthodontic treatment the first molar bands have been used to fabricate a passive palatinal bar like a lingual arch do. After the identification of right color and shape of the replacement tooth it have been taken a impression with the passive palatal bar in the mouth. At the laboratory the replacement teeth have been attached to this passive palatinal bar and the appliance have been cemented at the first molars.

Results: During the function this kind of fixed appliance provided a good distribution of the mastication forces in all the dental arch without pressing at the implant site, a very nice aesthetics, a good hygiene.

Conclusions: After 8 years using experience, I think this appliance can be an excellent treatment to postpone definitive treatment. The orthodontic treatment is being stabilized, the aesthetics have been achieved and the self confidence of the adolescent has not been compromised. Once growth has been completed and the parents are financially ready then implant therapy can be initiated.

Three Dimensional Mapping of Inter-Radicular Distances and Cortical Bone Thickness in Patients with Different Vertical Facial Dimensions
Mais Medhat Sadek, Noha Ezat Sabet, Islam Tarek Hassan
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Introduction: The purpose of this study was to determine differences in cortical bone thickness and inter-radicular distances in subjects with different vertical facial dimensions using cone beam computed tomography (CBCT). The goal was to provide reference data for clinicians placing mini-implants in subjects with different facial types.

Material and methods: This study was conducted on pre-treatment CBCT scans of 63 subjects (33 women and 30 men), aged between 18 and 30 years old. CBCT-synthesized lateral cephalograms were used to categorize subjects into three groups based on their vertical skeletal pattern. Using iCATVisionTM software, buccal cortical plate thickness (CPT) and inter-radicular distances (IRD) in the maxilla and mandible were measured in the entire tooth bearing region of the jaws at two vertical levels (4 and 7 mm) from the alveolar crest. In addition, palatal CPT and IRD were measured in the maxilla, at the same two vertical levels from the alveolar crest.

Results: Significant group differences were detected with high-angle subjects having significantly narrower cortices at some sites as compared to average- and low-angle subjects. Significant differences in IRD were also found among the three groups.

Conclusions: Cortical bone is thicker in low-angle than in average- or high-angle subjects in few selected sites at the vertical height in which mini-implants are commonly inserted for orthodontic anchorage. Awareness of the significant differences in inter-radicular distances among the three facial types should be considered when placing mini-implants in subjects with varying vertical skeletal pattern.
Low Level Laser Therapy for Accelerated Orthodontic Tooth Movement
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Aim: Owing to the long duration, orthodontic treatment becomes arduous to patients and so they tend to neglect or discontinue the treatment. Therefore it is obligatory to shorten the treatment duration.

Hence the purpose of this study was to evaluate the effect of Low Level Laser Therapy in accelerating orthodontic tooth movement.

Material and methods: A group of 13 patients with a mean age of 21 ± 4 years were selected for this study. After leveling and aligning canine retraction was initiated on both sides of the maxillary arch using NiTi coil springs delivering 150 g of retraction force. Low level laser therapy was applied around the maxillary canine periapical region on the test side. The other side was deliberated as control.

The rate of tooth movement was evaluated after 2 months. White Light scanning was done on the pre and post dental models to evaluate the exact movement of canine. This study was approved by the Institutional Research Ethics Committee.

Results: The mean tooth movement was 2.76 ± 0.99 mm on the lased side and 1.53 ± 0.57 mm on control side with a significant p value of 0.001. An average increase of 43% in the rate of tooth movement was observed on the lased side.

Conclusion: There was a significant increase in the rate of tooth movement on the lased side compared to the control side. Therefore Low level Laser Therapy could be an innovative break through to enhance orthodontic tooth movement thereby reducing treatment duration.

Masticatory Efficiency in Subjects with Angle Malocclusion Class II Division 1 and Malocclusion Class II Division 2
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Aim or Purpose: The aim of this study was to evaluate the differences in the masticatory efficiency between subjects with two types of malocclusion: class II – division 1 and class II – division 2, while performing a precise masticatory task.

Material and methods: A sample of 60 subjects (61% male (m), 39% female (f)), at the age from 19 to 33 years, distributed in three individual groups, representing subjects with normal occlusion (control group, n = 20), malocclusion class II/1 (n = 20) and malocclusion class II/2 (n = 20), were tested. The masticatory efficiency was evaluated objectively and precisely, using bilateral electromyography of masseter muscles, during a time-limited mastication (t = 2 min) of real test-food (walnuts = 2.0 g). Therefore, this neurophysiological method was called electromyomasticography.

Results: The masticatory efficiency was determined by these following parameters: the automatic habitual chewing rate (AHcr) and the biopotentials of the masseteric muscles in physiological resting position of mandible (BMfr). The results for the AHcr showed: 1.20 chewing strikes/s for normal occlusion (m = 1.16, f = 1.22); 1.30 chewing strikes/s for class II/1 (m = 1.36, f = 1.27); 1.27 chewing strikes/s for class II/2 (m = 1.31, f = 1.24), and 0.06 mV; 0.05 mV; 0.1 mV, for the BMfr of the three groups, respectively.

Conclusions: The classification of malocclusion, which was made by Angle, based on the differences in the morphological characteristics, also shows differences in the main function of the masticatory system. In other words, this study proved that there is statistically significant difference in the masticatory efficiency between subjects with normal occlusion, malocclusion class II/1 and malocclusion class II/2.
FC298
Does Orthodontic Treatment Improve the Quality of Life?
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Introduction: The preventive and the corrective aspect of malocclusion management are not only to improved the occlusal relationship and aesthetics, it also implies greatly to improve the confidence, interpersonal communication skill. The oral-facial region is the area of significant concern of the individuals to draw the most attention during interpersonal interaction; vocal, physical and emotional communication, so malocclusion management should concern to improve these aspects of improvement during and after orthodontic treatment.

Discussion: Now-a-days the numbers of people seeking for orthodontic treatment are increasing, that ranging from minor malocclusion to severe dentofacial deformity. Regardless the age of the patients and the severity of their problem their expectations about improvements in oral function, aesthetic, social acceptance is an important concern for orthodontist or dentist. Combine effort of orthodontist, dentist, dental auxiliary, patients family member often require to produce significant treatment improvement, in living standard, and to reduce the patient's drop-out rate during follow-up time.

Conclusions: Tropic to be covered in this presentation includes the electronic search review on the contribution patients of improving quality of life by orthodontic treatment. It will also highlight patient’s expectations and the possible contributory work-list by orthodontist, dentist, dental auxiliary, patient parents, family member in general to promote a much better treatment outcomes, with some clinical scenario where the combine effort really works.

Free Communication Session 48 | B342 | 31.08.2013 | 09:00–11:00

Theme: Preventive Dentistry: Public Health

FC299
Social Aspects of the Dental Treatment of Patients with Replaced Renal Function
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The success of renal transplantation is a combination of efforts of many medical specialists. Dental treatment of focal infection is necessary part of prepare for organ transplantation and following post transplant period.

Purpose: The purpose of the present study is to clarify the need of the methodology applied for dental focal sanitation of medical compromised patients in Faculty of Dental Medicine, Sofia, Bulgaria.

Material and methods: A direct inquiry about the opinion of 146 patients with replaced renal function (n = 70 on hemodialysis and n = 76 renal transplanted) was held. The inquiry includes 13 questions related to dental diagnostic and treatment that was performed under specific methodology in Faculty of Dental Medicine, Sofia, Bulgaria.

It was used the following statistical methods: Descriptive analysis – tables represent the frequency distribution of the studied symptoms divided by groups of research; variation analysis; graphical analysis; single factor dispersion analysis (ANOVA); T – test for significant statistical differences.

Results: The necessity for a more complex study is obvious in order to prevent rejection of transplanted organs because of foci infection within maxillofacial area.

Conclusion: The co-operation and opinion of the patients in a treatment is a paramount importance especially in live saving operations which are for example organ transplantations. Dental medicine is a part of the transplantation team and Bulgaria is apt to flatter itself with the realization of the unique program for dental treatment of patients with a forthcoming and completed organ transplantation.

FC300
Socioeconomic Mobility and Tobacco Consumption Patterns in Fish Industry Workers
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Aim or Purpose: The aim of this study was to understand the tobacco consumption patterns and their relationship with life course socio-economic mobility among fish industry workers as this could provide important information in dealing with the tobacco problem in this very vulnerable population.

Material and methods: Socio-economic life course data and information about tobacco habits was collected from 102 fish industry workers. A subject was considered to be upwardly mobile if the family head's educational attainment and the number of earning members increased and the number of children and dependants decreased since childhood in his or her household. Oral examination was also done for malignant/premalignant lesions. Ethical approval was obtained prior to the study. Chi square test was used to compare frequencies and all statistical analysis was done using SPSS (version 16) software.

Results: Of the 102 subjects, 64 regularly consumed tobacco either in smoking or smokeless forms and the common reasons for the habit were the co workers’ influence and to keep awake at work. Fourteen subjects had premalignant lesions in the oral cavity and all them were in the buccal mucosa. The frequency of tobacco consumption and the duration of the habit were significantly lower (p ≤ 0.05) among those whose socioeconomic condition showed an upward mobility since childhood.

Conclusions: A holistic approach consisting of efforts to improve the overall socioeconomic conditions can be more effective than piecemeal solutions in dealing with the tobacco menace.
FC301
Evaluation of Practice of Cross Infection Control for Dental Impressions among Laboratory Technicians and Prosthodontists in KSA
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Objectives: To assess the current practice of cross infection control of dental impressions in governmental and private dental labs & prosthodontic clinics of MoH, Al-Qassim, KSA, evaluating how dentists are communicating with lab personnel about impression disinfection, and, detecting awareness about infection control practices in dental laboratories.

Material and methods: Cross-sectional study including self-administered anonymous questionnaires. The sample included 50 dental technicians and 55 dentists in two cities. Technicians and prosthodontists were subjected to questionnaires consisting of 26 and 14 questions, respectively. Forty six questionnaires were completed for technicians and 48 for prosthodontists.

Results: More than 60.00% of technicians knew that impressions have been disinfected and 56.25% of dentists notified technicians that impressions have already been disinfected. About 64.00% of technicians had an agreed protocol between lab and clinic, and 40.74% of prosthodontists notified technicians through notes on impression bags. About 61.00% reported that all technicians in lab were vaccinated for HBV. Only 6.52% of technicians apply all protective precautions when receiving impressions. Fifty percent of the prosthodontists aren’t sure that technicians disinfect impressions before pouring. About 65.00% of technicians feel that laboratories are adequately instructed for disinfection techniques of different impression materials and on contrary, 66.67% of prosthodontists didn’t feel that.

Conclusion: Moderate communication between dental laboratory technicians and prosthodontists. The majority of dental technicians were vaccinated for HBV. Most dentists didn’t pour impressions in their clinics. Lack of communication between prosthodontists and their dental technicians was noticeable. Significant nonconformity of view between dental technicians and prosthodontics was reported.

FC302
Text2Floss an Innovative Option to Improve Oral Health Across Continents
Jack Dillenberg, Tony Hashemian
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Introduction: Mobile phones are becoming essential to daily life. The popularity and ease of mobile technology has great potential as a source of health information. Texting may be utilized as a tool to engage the public in a cost effective way to promote health education. Text2Floss will bring a new simple and innovative tool to the global community to help communicate with patients. Text messages may help to engage the patient and bridge the gap for education in continuation of care through oral health awareness.

Conclusion: This innovative concept has the potential to be a global initiative to reach people around the world with access to cell phones, including underserved communities. A text could be utilized as a tool to communicate and remind the public of the importance of oral health through oral hygiene, such as brushing and flossing.

FC303
The Dental Caries Experienced on 3–5 Year Old Children Expressed by ICDAS-Index
Blerta Latifi Xhemajli, Agim Begzati, Teuta Ademaj Kutlovcî, Aida Namani Rêxhêpi, Blerta Musliu Krasniqi, Arjana Btryqi
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Introduction: The international epidemiological criteria used by the WHO standard do not register lesions caries in pre cavitation stages, such as white spot lesions. Thus, the progress of non-cavitated caries lesions in populations it is an important evidence of using new indices in a public with new dental profile.

Aim: The aim of the study was to assess the caries experience of young children, using the ICDAS system and to investigate determinants of dental caries.

Methodology: A cross-sectional survey was undertaken in children aged 3–5 year. The survey was carried out in some kindergartens of Pristina-capital city of Kosovo during the January and February of 2013, by one calibrated examiner, on a sample of 193 children using the ICDAS criteria.

Results: Total number of examined teeth and surfaces was: 3860/19,300. The prevalence of dental caries, including enamel and dentinal carious lesions, in primary teeth was 80.8%. Number of carious experienced teeth was confined to 1225 (31.7%). The mean value of carious teeth 6.38 (±4.5). Caries free subjects numbered 37 (19.1%). The most frequent code it was 06-extensive distinct cavity with visible dentin, while 02-distinct visual change in enamel it was rare.

Conclusion: Dental caries has been shown to affect a significant number of children in our country. The decay component predominated, with hardly any restorations or extractions observed. More effective strategies are needed to prevent this high rate of caries in young children.

FC304
Prevention of Cross Contamination in the Area of Infection Control Procedures in Dental Laboratory and Clinic
Mohamed Khaled Ahmed Azzam
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Introduction: This article focuses mainly on the prevention, communication, education and professional development in the area of safety and infection control procedures in dental clinics and laboratories, to assist both dental health providers and technicians to assume proper safety measures and avoiding cross infection to patients and colleagues.
Methodology: Dental clinics, procedures and instruments in the lab. liable to cross contamination were tested run using culture sensitivity tests on blood agar and Mc.conkey mediums in addition to swabs on monthly basis as for the following:

1. Clinics and laboratory air environment was tested
2. Alginate impressions, brushes, ragged wheels, pumice and lathes were tested
3. The laboratory better operated as a “Clean Dental Laboratory” not “Standard Dental Laboratory”

Results: Gram -ve pathogens as Klebsiella and fungal infection as well as commensals (staph.albicans) were present. By proper suction system in the clinics and lab. and regular air-conditioning filters cleaning fungal growth was avoided. Virkon 2% as a surface disinfectant and instruments soaked for 24 h were used to eradicate pathogenic and non pathogenic bacteria. Presept half gram tablets diluted in half liter of water sprayed, wrapped and left for 10 min on incoming material to the lab. as impressions, bite blocks, face-bows crowns also eradicated the pathogenic and non pathogenic organisms

Conclusion: The infection control measures should be taken very seriously for all patients and dental personnel for a better and healthier life.

FC305
Tobacco-Use Cessation in Dental Clinics: A Survey of Dentist’s Knowledge, Attitude and Practices
Thanveer Kalantharakath, Ajith Krishnan, Pulikt Kalyan
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Aim: To assess tobacco-use cessation related knowledge, attitude and practices among practicing dentists.

Material and methods: A cross sectional questionnaire survey was conducted among dental practitioners registered in Indian dental association, Vadodara Branch, India.

All the registered dentists in Indian Dental Association, Vadodara were selected for the survey. A self administered pre-tested close ended questionnaire consisting of questions related to their graduation, number of years in active dental practice, knowledge attitude and practices towards tobacco use and cessation advice to the patients was used. The questionnaire was piloted among 20 clinical practitioners. Only completely filled questionnaires and response from those who are in active practice since the last 5 years were considered for the study.

Results: Out of the 180 completed questionnaires, 129 (71.6%) respondents were graduates and 51 (28.3%) respondents were post graduates. Ninety-three (51.6%) respondents had never undergone any formal training in tobacco cessation. Only 56 (31.1%) respondents strongly agreed that tobacco cessation advice is the responsibility of dental practitioners. Only 92 (51.1%) of the practitioners advice tobacco cessation to their patients.

Conclusion: It is concluded from the results that just over fifty percent of dentists surveyed were cognizant of tobacco cessation methods and incorporated the same in their practice. The need for dentist to acquire knowledge and assume responsibility towards this cause in principle and practice has been strongly felt.

FC306
Can Dental Panoramic Radiography Help Screen Osteoporosis in Postmenopausal Women?
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Aim: Early detection of osteoporosis is an important public health goal and dentists might play an important role in its diagnosis with dental radiographs having a great potential as a screening tool.

Material and methods: Using a retrospective cohort study design, the authors enrolled a sample composed of female subjects who were ≥50 years of age, who had a dental panoramic radiograph and a bone mineral density (BMD) scan within 2 years of each other between 2006 and 2012. The predictor variables included demographics, average gonial and antegonial angles, mandibular cortical bone integrity (MCBI), periodontal disease status, number of remaining teeth, body mass index (BMI) and bisphosphonate usage. The primary outcome measure was BMD T-score (BMDT-sc) as determined by dual emission x-ray absorptiometry.

Results: Descriptive and logistic regression statistics were computed and p-values < 0.05 were considered significant. Sample composed of 274 subjects with a mean age of 64 ± 9.3 years. Average BMDT-sc was −1.39 ± 1.11. Sample’s 27.11% were normal (BMDT-sc > −1), 50.92% were osteopenic (BMDT-sc between −1 and −2.5), and 21.98% were osteoporotic (BMDT-sc < −2.5). Of the predictor variables examined, MCBI (p = 0.019), age (p < 0.0001), BMI (p < 0.0001), and bisphosphonate usage (p = 0.037) showed significance with a BMD diagnosis of osteopenia/osteoporosis. Other variables didn’t demonstrate significance. In a multivariate logistic regression analysis, MCBI didn’t demonstrate significance (p = 0.6), whereas age and BMI remained significant (p < 0.0001).

Conclusions: In conclusion, given MCBI’s significance in univariate analysis and biologic plausibility, dentists might use it as a risk assessment tool to recommend a BMD scan for elderly women patients.

FC307
Areca Nut Chewing Among Primary School Children of Karachi, Pakistan
Ambrina Qureshi, Arham Nawaz Chohan
Department of Community Dentistry, Dr. IshratulEbad Khan Institute of Oral Health Sciences, Dow University of Health Sciences, Karachi, Pakistan

Objective: Areca nut chewing is more prevalent in South East part of subcontinent. Objective was to present prevalence and associated factors of this habit among primary school children of Karachi, Pakistan.

Methodology: A sample size of 600 was calculated. Multi stage random sampling was used. Nine out of 18 towns of Karachi were identified and two schools (public and private) from each town
were selected. Only primary school children (grade 1–6) were randomly selected. Areca nut chewing habits were recorded on a structured performa. Data entry was done by using SPSS v 16 where univariate and multivariate analysis were performed.

**Results:** Mean age of the subjects was 9.5 ± 2.2 years (range = 7–11 years); boys (52%) and girls (48%). Almost 35% (n = 330) children reported of habitually consuming areca nut even though 88% of all schools had imposed restriction on selling of these products within school premises. This was observed more in boys (n = 205) than girls (n = 120). Increased prevalence and associations were found in children of more younger age (p = 0.03) and those belonging to families of low socio-economic (p = 0.01). No associations were found with child habit and parental education (p = 0.15) and similarly to child awareness and habit (p = 0.17).

**Conclusion:** Despite ban on selling of these products in Karachi business of such harmful tobacco substances still continue and sellers/manufacturers are busy making most of the situation. An initiative approach is recommended for guardians and communities to put off areca nut use.

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**FC308**

**Holistic Approach to Preventive Dentistry as Applied in Manisa, Turkey**

Can Polat, Nilgün Yaşar Polat, Yıldız Karakuş, Galip Koroglu, Ziya Tay

**Ministry of Health, Public Health Department, Manisa, Turkey**

**Aim:** The present paper focuses on the holistic approach to preventive dentistry as applied in Manisa, Turkey by the Manisa Public Health Department.

**Methods:** The relevant approach is crafted within the conceptual strategy of WHO-Global goals for oral health 2020 and is based on the functional preventive dentistry principles.

The practical side of this approach is framed by five programmes covering the whole range of target population in the region, namely;

1. Caries prevention through fluoride and fissure sealants application and cariogram
2. Maintaining gingival health
3. Educational tool to promote oral health
4. Oral epidemiology studies
5. Informational database for oral health

**Results:** By date, a total of 93,000 students were fluoridated via brush-on gel application, fissure sealants have been used for handicapped people, fluoride varnish has been applied to pre-school children, cariogram was applied to freshman students in all high schools.

A GI survey was conducted to reveal the nature of gingival health in the region and adult population mainly in rural areas received proper intervention.

More than 150,000 students, teachers and parents were given the opportunity to learn the basic steps to be taken to stay away from caries.

In-depth analysis was conducted on oral epidemiology data periodically collected.

Informational database was introduced for recording and storing the relevant data.

The presentation will also focus on SWOT analysis of the approach-in-question.

**Free Communication Session 49 | B343 | 31.08.2013 | 09:00–11:00**

**Theme:** Dental Treatment & Restorative Dentistry: Prosthetics

**FC309**

**Effects of Splint Therapy on Temporomandibular Joint Disorders with Respect to Anxiety and Depression**

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**Aim:** The aim of this study was to investigate the effects of the splint therapy on anxiety and depression levels of patients with temporomandibular joint disorders (TMD).

**Material and methods:** A standardized Research Diagnostic Criteria for TMD (RDC/TMD) assessment was performed on 48 patients. General, dental and TMD history data were taken from the patients. Visual Analog Scale (VAS), Spielberger’s State-Trait Anxiety Inventory (STAI) Scales and Beck Depression Inventory (BDI) were used to measure pain levels, anxiety and depression respectively. These measurements were performed before splint therapy and after the first week, first month, third month and sixth month of the splint therapy. Statistical evaluation was performed using SPSS for Windows 18.0 with repeated measures ANOVA and Bonferroni tests. The study was evaluated and approved for scientific and ethical aspects by the Clinical Research Evaluation Committee of Yeditepe University on September 21th, 2010 (reference #49).

**Results:** Mean VAS levels of the patients were significantly decreased (before: 6.06 ± 2.96; after: 1.71 ± 1.98; p < 0.05). The patients’ STAI levels were decreased throughout the splint therapy. While the first week’s STAI levels were 40.17 ± 9.93; 47.57 ± 9.30, after 6 months the values were decreased to 35.30 ± 9.26; 43.68 ± 8.71. Similar to the data of the STAI, depression levels were also decreased after the splint implementation therapy. Depression levels of the patients were 17.48 ± 9.95; 14.27 ± 7.90, but the most significant decreasing was observed after the third month (12.06 ± 7.96; p = 0.001).

**Conclusion:** Splint therapy not only reduced the pain, but also seems to have contributed to the improvement of the patient’s emotional situation.

**FC310**

**Epidemiological Study of Fixed Prostheses Effects on the Interproximal Space**

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Objectives: Being the most exposed site to bacterial infections, this study aimed to evaluate retrospectively the effects of fixed prostheses on the interproximal space in order to recommend clinical protocols to save as much as possible healthy surrounding tissues.

Methods: An observational longitudinal study was carried covering a sample of 84 patients spanning a period of 11 months. The patients presented to the fixed prosthetic dentistry department. Inclusion criteria were:

Healthy patients presenting no known general pathology.

Patients with a conventional fixed prosthesis who showed no periodontal disease.

Results: The results confirm that the overcontour, the non-reconstitution of the contact points and the subgingival status of the prosthetic limit represent the essential causes of dental and periodontal pathologies. On the other hand, the important role of motivation to maintain dento-periodontal health and the prosthetic longevity was confirmed.

Conclusions: The role of the clinician is very important to avoid adverse events. Moreover, the dental laboratory technician must be well trained and have the knowledge necessary to apply good oral hygiene recommendations while manufacturing and faithfully reproduce the exact mouth anatomy. In addition, monitoring is very important to keep the prosthesis and prevent the development of pathologies. The patient’s motivation and a strict methodology for evaluation and preparation of the periodontium, execution and registration limits, laboratory technology, may allow the prosthesis longevity. Dentists should pay minute attention to contact points, contour and finish lines to prevent periodontal pathologies.

FC311
Esthetic Outcome Evaluation of Maxillary Anterior Single Tooth Bone Level Implants
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Purpose: The aim of this study was to evaluate the treatment outcome of implants in the esthetically demanding regions.

Material and methods: Patients were treated with implant (Straumann Bone Level Implant, Institute Straumann, Basel, Switzerland) supported all ceramic single crowns and followed for 2–4 years. Esthetic parameters were recorded to assess treatment outcomes. Pink esthetic score and white esthetic score (PES/WES) was applied for the objective esthetic outcome assessment of anterior single-tooth implants. The patients’ own appreciation were also evaluated by means of questionnaire.

Results: Fifty-five implants were placed in 47 patients. At the recall examinations, all implants were successfully integrated, demonstrating healthy peri-implant soft tissues as documented by standard clinical parameters. Esthetic outcomes confirmed pleasing results overall. The mean total PES was 9.03–0.93 (range: 7–10) at 3 years. The PES parameter facial mucosa curvature (1.69–0.47) had the highest mean values at baseline, whereas the root convexity was the most difficult to satisfy. For the papillary area, mean scores of 1.22–0.42 for the mesial papilla and 1.3–0.46 for the distal papilla at baseline increased to 1.65–0.48, 1.56–0.5 respectively at the last recall. For the total PES, none of the 55 single tooth implants scored <6. For the WES, the mean total was 8.15–1.11 (range: 6–10). Of the 55 implant crowns examined, none of them scored below the threshold of 6. The follow up revealed pleasing esthetic outcomes and stable facial soft tissues with bone level implants.

FC312
Evaluation of Bonding Strength of Repair System on Zirconia Restoration
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Objective: The aim of this study was to examine the shear bond strength of repair material after various surface treatments to zirconia restoration.

Material and methods: Two porcelain system (Zirconzahn, Cerabien Zr-Noritake) and two surface treatments were used. A total of 60 specimens were prepared and divided into six groups (n = 10). Then applied with four combinations of two different surface preparation method (air abrasion, Er-YAG Laser) and two porcelain systems; two groups were also bonded without surface treatment as control. Repair material (Cimara Zircon, Voco, Germany) were applied to the specimens by packing the material into the cylindrical plastic matrices (Ultradent, South Jordan, Utah). After 24 h of storage at 37°C, the shear bond strength (MPa) of the specimens was measured in a universal testing machine. Each specimen was subjected to SBS testing at 1 mm/min crosshead speed. One-way analysis of variance (ANOVA) and Duncan multiple comparison test (p < 0.05) were used to analyze the results.

Results: While the Y-TZP-Ctrl had showed the highest SBS (p < 0.05), Y-TZP-Las demonstrated the lowest SBS (p < 0.05). Also, there is no statistically differences among the Feld-Las, Y-TZP-AA, Feld-AA groups (p > 0.05).

Conclusion: Zirconia repair system using can be recommended as manufacturer advice without surface treatment.

FC313
Growth of Microorganisms on Patients with Dentures, In Vivo Study
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Aim: The place where microorganisms grow is what is called habitat. In patients with dentures there is a predominance of Lactobacillus, Streptococci and Candida species, which can cause mucosal
lesions, although this tissue has a defense mechanism against microbial attacks. The main purpose of this study is to determine the microbial growth, to assess the level of hygiene applied, and evaluate the behavior of the oral mucosa in patients with dentures. 

**Methods:** Cohort study, sample = 23 cases of all patients that attended the area of Prosthodontics of UNIBE’s Dental Clinic, located in Santo Domingo, Dominican Republic, to which dentures were prepared, during the period of January 2010 to December 2011. Microbiological cultures were performed in different media, and the data analyzed in SPSS 19.

**Results:** In Kruskal–Wallis and Chi Square Test, not significant differences were established between the cultures media used to determine the growth of microorganisms.

The patients with superior dentures had a similar level of microorganisms at 4 and 6 months (Streptococcus, Diplococcus gram neg. and Candida). Roughness factors of dentures and oral hygiene promote the proliferation of Candida. An isolated case of Pseudomona in our findings is of concern because of the systemic and oral cavity infections it can cause.

**Conclusions:**

The use of implants to support complete dentures, brings positive impacts in the (OHFQoL) of Turkish elderly patients.

**FC315**

**Influence of Laser Application on Bond Strength of Fiber Posts**

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**Purpose:** This study evaluated the effect of laser and silane application on the push-out bond strength of glass fiber posts cemented with self-adhesive resin cement.

**Material and methods:** Forty human maxillary central incisors were sectioned below the cementoenamel junction, and the roots were endodontically prepared to receive a fiber post. The roots were randomly divided into four groups of ten specimens each to test different surface treatments: (Gr 1) Control; no surface treatment; (Gr 2) Er,Cr:YSGG laser (Waterlase) application to root canals; (Gr 3) Silane (Bisco Bis) application to post surface for 60 s; (Gr 4) Er,Cr:YSGG laser+Silane application. The glass fiber posts (DT Light Post) were cemented to prepare root canals with self-adhesive resin cement (C&B Cement). Bonded specimens were cut (1-mm-thick sections) and push-out tests were performed with a universal testing machine at a crosshead speed of 0.5 mm/min. Data were statistically analyzed with one-way ANOVA and Tukey HSD tests (α = 0.05). Failure modes were evaluated using a stereomicroscope at original magnification x40.

**Results:** Push-out bond strength values of laser and laser+silane treated groups were significantly higher than that of control and only silane treated groups (p < 0.05). Laser+silane treated group showed the highest bond strength values whereas control group showed the lowest. Adhesive failure between fiber post and the resin cement was the most frequent type of failure.

**Conclusion:** Laser treatment to root canals, and silane treatment to fiber post surface following laser application may help to increase the bonding strength of fiber posts.
Results: Data were analyzed using oneway analysis of variance and post hoc tests. There were statistically significant differences in mean volumetric shrinkage of different shades. The minimum shrinkage percentage was observed in Opaque Yellow shade group (2.62) and maximum shrinkage percentage was observed in Brown shade group (3.96). Different shades of resin cements show various polymerization shrinkage.

Aim: The aim of the present study was to test the hypothesis that Akacid plus, a novel polymeric compound of the cationic family of disinfectants, would be an alternative method for disinfection of polymethyl methacrylate (PMMA) denture base materials in vitro model.

Material and methods: Heat-polymerizable PMMA denture base material (Meliodent) and four solutions (polymeric guanidine, alkaline peroxide-type disinfection agents, sodium hypochlorite and distilled water) were used. A total of 40 PMMA disc specimens (10 mm diameter × 2 mm thick) were prepared and assigned to four groups. Candida albicans was incubated on Sabouraud dextrose agar (SDA) at 37°C for 48 h. After dilution, a final yeast suspension of approximately (10⁶)² Candida albicans per milliliter was prepared. Ten PMMA disc specimens for each group were placed in a sterile tube containing 2 ml of fungal suspension, incubated at 37°C for 90 min and treated with 1% Akacid plus (5 min), Fittydent (30 min) or 0.5% sodium hypochlorite (10 min) solution. Distilled water (15 min) served as the negative control. Remaining adherent microorganisms were assessed by colony-forming units. Statistically significant differences were determined by Mann–Whitney U test.

Results: The disinfection method using 1% Akacid plus significantly decreased adherent microorganisms when compared to the negative control (p < 0.001) and Fittydent (p < 0.01).

Conclusions: The polymeric guanidine Akacid plus could be used as alternative method for disinfection of PMMA denture base materials.

Free Communication Session 50 | B360 | 31.08.2013 | 09:00–11:00

Theme: Implantology: Oral Surgery

Effect of Polymeric Guanidine on Disinfection of Denture Base Material
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Material and methods: Adjusted trephine drills were used to harvest manly cortical, cylindrical transplants from the retro-molar region of the mandible. After preparing the recipient site with accurately fitting grinding drills, the bone grafts were transplanted and immobilized using one micro lag-screw.

Results: The horizontally compromised alveolar ridges were successfully augmented and treated with dental implants. No major complication occurred during transplantation, the healing period, and subsequent implant therapy. One out of twenty-five patients presented with temporary dysesthesia of the inferior alveolar nerve.

Conclusion: The new method presented is a precise and effective treatment option for horizontal alveolar ridge augmentation prior to implant installation.

FC320
Effect of Platelet-Rich Fibrin Application during Implant Surgery: 2 Years Results
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Background: The objective of this study was to evaluate the effects of simultaneous application of Platelet-rich fibrin (PRF) with implant placement to implant success after 2 years of maintenance.

Material and methods: Nineteen patients (12 male and 7 female, 44.2 ± 12.5 years of age) with more than two missing teeth were included in the study. Sixty-four implants were placed to 19 patients. Implants in one quadrant were randomly assigned to test group and PRF was applied in the prepared implant sites immediately before the insertion of implants. Implants in the opposite quadrant served as control group and no additional procedure was performed. Two years after surgical procedure, patients were re-evaluated. Thirty implants (15 tests, 15 controls) of eight patients were evaluated, and pocket depth, bleeding on probing, plaque index and presence of occlusal trauma were recorded. Radiographic bone loss around the implants were determined by measuring the distance between implant shoulder and crest of alveolar bone on both mesial and distal surfaces on panoramic radiographs.

Results: There were no statistically significant differences between control and test groups in terms of pocket depth, bleeding on probing, plaque index and occlusal trauma (p > 0.05). Simultaneous application of PRF during implant placement didn’t demonstrate any negative effect on clinical and radiographic parameters.

FC321
Management of a Giant-Cell Tumor Associated with an Impacted Canine
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Aim: Giant-cell tumor of the jaw presents difficulty in diagnosis. It is rare in the head and neck regions and may resemble, clinically and histologically, other types of jaw lesion. However, histologic study may distinguish this lesion from a giant-cell granuloma, an osteogenic sarcoma, and most epulides. Adequate surgical excision with a long-term follow-up is the recommended treatment of choice.

Case presentation: A 12 year-old girl was addressed by his dentist to the department of oral medicine oral surgery of University clinic of dentistry, Monastir for a soft buccal swelling on the right side of the maxilla which is revealed by a routine dental examination.

Intraoral examination revealed a buccal swelling involving the right maxillary canine which is deeply impacted. A panoramic radiograph showed an extensive well-defined radiolucency involving the ectopic impacted canine. According to the clinical and radiography presentations a diagnosis of giant-cell tumor, central giant cell granuloma, dentigerous cyst or any osteolytic tumor were discussed.

The treatment consisted of curettage and surgical excision and conservation of the canine. The histological result was a giant cell tumor.

Results: The results of the parathyroid hormone (PTH) and phosphocalcic assessments were normal. At 20 months postoperatively we obtained spontaneous eruption of the canine in ectopic buccal position. Then an orthodontic treatment has been planned in order to bring the canine to its normal position in the dental arc and to achieve a stable functional occlusion.

FC322
Management of Two Large Radicular Cysts with Enucleation and Orthograde Retreatment
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Aim: Radicular cysts are the most frequent cysts affecting the jaws, which are a result of inflammatory process in the periapical tissues. Significant growth is possible and with large lesions surgical enucleation and extraction or decompression are the basic treatment options.

Case: This case reports on the treatment of two radicular cysts localized on the left premolar-molar and right premolar region of the mandible jaw. A 40 year-old male patient presented with swelling in the left mandibular molar region of 6 weeks duration. The patient gave a history of root canal treatment of left second premolar, left first molar and right first premolar teeth performed 4 years ago. Clinical findings indicated swelling on left premolar-molar region and the teeth were excessively mobile. Conventional radiographic findings revealed two large well defined radiolucencies; the larger one involving left first molar and both premolar teeth; the other involving right first premolar teeth with external apical resorption. The axial C.T. sections showed expansile periapical lesion localized in the left molar area with perforation of buccal plates of bone. Surgical enucleation of the cyst and extraction of the involved left first molar and premolar teeth were performed. Orthograde repositioning of right premolar tooth and surgical
enucleation of the cyst was performed, as the patient was desirous to retain his teeth. At the 9-month follow-up appointment the lesions showed considerable resolution and positive osseous regenerative response was observed.

**Conclusions:** In the present case the result confirms previous reports demonstrating that large radicular cysts can be successfully treated.

**Theme: Implantology: Oral Pathology**

**FC323**

**Mechanism of Rescue for the Secondary Palate Cleft with Overexpression of Smad2**

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**Aim:** In analyses of non-syndromic cleft palate, a linkage to TGF-β3 has been shown. Signalling of TGF-β is mediated in the cell through Smad2. The goal was to understand the mechanism of palatal fusion in the rescue mice compared to wild-type.

**Methods:** The heads of embryos at age (E14.5) of rescued, Smad2 overexpression and wild-type models were embedded in paraffin after genotyping and fixation. Serial 7 μm sections were studied for detection of apoptosis and epithelial mesenchymal transition using immunohistochemistry. Images were captured with confocal laser microscope. Activation of Smad2 was studied with phospho-Smad2 antibody, and the level of Smad2 in each embryo normalized with immunoblotting.

**Results:** TGF-β3 null mice developed a secondary palatal cleft while the TBF-β3 null mice that had also inherited the K14-Smad2 gene had fusion of the secondary palate. The effect of the K14-Smad2 expression was analyzed in the medial edge epithelium of the rescue mice; the MEE had a much higher ratio of cells with cleaved caspase, a marker of apoptosis, than in the control fused palates. The increase in apoptosis was correlated with increased p-Smad2 in the same cells while p-Smad2 in the control mice with normal palatal fusion was not associated with high levels of apoptotic MEE.

**Conclusions:** Smad2 overexpression might rescue the cleft in the secondary palate of mice by increasing apoptosis of epithelial cells in the middle seam. Thus the mechanism of rescue is not identical to the events that normally occur during palatal fusion.

**Theme: Implantology: Implantology**

**FC324**

**Evaluation of Implant Placement in Extraction Sockets of Periodontally Involved Teeth Using β-Tricalcium Phosphate with Bone Morphogenetic Protein**

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**Background:** This study aimed to evaluate osseointegration clinically and radiographically around dental implants placed into fresh extraction sockets of periodontally affected teeth using Bone Morphogenetic protein with the β-tricalcium phosphate.

**Methods:** A clinical trial was carried out on twenty fresh extraction sockets of periodontally involved teeth in male patients selected with age range from 20 to 45 years, sockets implanted with immediate endosseous implant and grafted with β-tricalcium phosphate and bone morphogenetic protein. Clinical parameters (Plaque index, Gingival index, width of keratinized mucosa, attachment level and the pink esthetic score) were recorded at 3, 6 and 12 months postoperatively. Radiographic evaluation was done at baseline, 6, 12 months post-surgery.

**Results:** The results demonstrated that, all patients showed an excellent tissue healing response with no adverse complications. Comparison of plaque index, gingival index, width of keratinized mucosa and attachment level at different periods of follow up were not found statistically significant. Radiographic analysis revealed that there was statistically significant differences in the linear distance from the implant shoulder to the first visible alveolar bone contact (BID) and mean value of gray level in the selected region of interest (ROI) at all follow up periods.

**Conclusion:** Addition of bone morphogenetic protein was advantageous in improving of osseointegration around dental implants in fresh extraction sockets of periodontally affected teeth.

**FC325**

**Predictable Guided Bone Regeneration in the Aesthetic Zone**

Dimitrios Zabaras

Higeia Hospital, Athens, Greece

**Aim:** The aim of the presentation is to compare the rehabilitation of vertical and horizontal bone defects treated with implants with different techniques of Bone regeneration.

**Material and methods:** Fourteen cases were selected of Guided Bone regeneration dealing with vertical and horizontal defects in severe and very severe cases. Two cases treated vertical defects, four treated horizontal defects. In two cases there is a comparison of bone regeneration with bone block vs. bone chips. In four cases there is the comparison between the use of resorbable and non resorbable membranes with autologous bone graft. Two cases with failed GBR are presented and causes of failure analyzed.

**Results:** The complete bone fill of a bone defect is related to the proper case selection and the proper selection of bone materials (autologous, allografts, xenografts), membranes (resorbable, non resorbable) and surgical techniques.

**Conclusion:** Guided bone regeneration is closely associated to implants. It is predictable in most cases but clinical details have to be carefully evaluated and handled.
Impact of Citric Acid Etching on Biocompatibility and Osseous Organisation of a Natural Bovine Bone Mineral

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Aim: Within the last years it was shown that etching of biomaterials can improve hydrophilicity, cell proliferation and osseointegration. The aim of the present study was to evaluate the influence of superficial etching of a xenogenous bone mineral on cell proliferation and bone regeneration.

Methods: A granular bone substitute material (BSM) (BEGO OSS ® [BO]), BEGO Implant Systems, Bremen, Germany) was superficially etched using citric acid (BEGO OSS acid [BOA]). Surface alterations were evaluated using SEM imaging. BO and BOA were incubated with 1 x 10E4 human osteoblast-like cells (SaOs-2). After 2 h, 3 and 7 days, cell proliferation was measured (n = 8) and analyzed for statistical difference. Cell morphology was investigated using SEM (n = 3). In the in-vivo part, BO and BOA granules were used for lateral augmentation of the maxillae of four beagle dogs and covered with a collagen membrane. Healing periods were 3 and 8 weeks (n = 2, respectively).

Results: In-vitro evaluation revealed statistically significant higher cell proliferation after 3 and 7 days on BOA compared to BO (p < 0.05, Wilcoxon test). SEM observation presented flat and star-shaped SaOs-2-osteoblasts displaying high numbers of lamellodopa. In vivo, both BSM showed osteoconductive properties and osseous organisation after 8 weeks. Hereby, the interconnection between the newly formed bone and BO seemed to be more accentuated than for BOA.

Conclusion: Within the limits of the present study it was concluded that superficial etching of natural bone minerals using citric acid may support osteoblast-like cell proliferation. Further studies are necessary to specify the impact on bone regeneration.

Theme: Implantology: Oral Surgery

Effectiveness of Diode Laser in Reducing Postoperative Complications

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Objective: The aim of this study is to find the answer of “What is the effect of diode laser at biostimulation dose on postoperative complications after oral surgery?” question.

Materials and methods: Twenty healthy patients who have bilaterally, asymmetrical impacted lower third molars and need surgical removal of these teeth were included the study. The side which was operated on first was allocated randomly as was the “placebo group” or “irradiated group”. For irradiated group, each patient was given low dose laser-called as biostimulation dose- with continuous, 2.75 Watt power density and 940 nm wavelength for 15 s after the operation. For the other side which was named as “control group”, no energy was given. Each patient was evaluated pre-operatively, 48 h postoperatively and 7th day after operation for the assessment of pain, swelling and trismus. Statistical analysis was based upon the comparison between groups using Wilcoxon test.

Results: Clinically, both groups demonstrated similar results. Furthermore, there was no statistically significant difference between the groups on postoperative complications.

Conclusion: There was no benefit of diode laser therapy on postoperative complications. There is the possibility that efficacy of laser therapy may be dose dependent and that a longer exposure should have been given several times during the postoperative period.

Efficacy of Taking Buprenorphine Sublingual Tab on Postoperative Analgesia in Mandibular Third Molar Surgery

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Background: Surgical removal of impacted third molars in one of the most common surgical procedures in dentistry. This procedure needs an effective analgesic to relieve the post-operative pain.

Purpose: To assess effect of Buprenorphine sublingual tab on post-operative analgesia after mandibular third molar surgery.

Materials and methods: Forty-six cases were enrolled in this randomized, double blind clinical study and were randomly assigned in to two groups based on the sublingual pearl received. Patients in group 1 received 0.2 mg sublingual Buprenorphine and those in group 2 received placebo. To assess the quality and duration of post-operative analgesia, patients were asked to record their pain experience on VAS (visual analog scale) and NRS (numeric rating scale) every hour for the first 10 h at 12, 24, 36 and 48 h after surgery. In the event of poor pain control, patients were permitted to take escape analgesia (acetaminophen 500 mg). Pain intensity, duration of post-operative analgesia and the number of escape analgesia required were recorded. Patients were questioned about any probable side effects. Student T-test and Pearson correlation were used for statistical analysis.

Results: Patients received Buprenorphine experienced significantly less pain during the first 3, 4 and 5 h. These was no significant difference between two groups in duration of post-operative analgesia but the number of escape analgesia used was less in patients received Buprenorphine, according to the present results, there was significant and strong correlation between VAS and NRS scores.

Conclusion: Taking 0.2 mg sublingual Buprenorphine before surgical removal of impacted lower third molar may reduce the post-operative pained the number of required analgesics.
Material and methods: Questionnaires were given to twelve dental laboratories with more than 15 employees in Athens, Greece. Two of these labs were specialized in the fabrication of non-metal clasp removable partial dentures made by thermoplastic resins such as polyamide, polycarbonate or polyethylene terephthalate material. The rest ten labs were operating in the wider spectrum of Prosthodontics. The questionnaires supplied were related to problems and after usage repairs of non-metal clasp removable partial dentures made by thermoplastic flexible resins.

Results: The most common need for repair was the loss of an abutment tooth (50%), followed by the need for rebasing due to loss of the fit (20%). Staining, surface roughness, bad odor, tooth debonding were some more drawbacks associated with that kind of prostheses.

Conclusions: Non-metal clasp removable partial dentures made by thermoplastic flexible resins provides patients with improved esthetics and comfort but having the disadvantages of lacking stability-support create bone resorption and forces and moments at the abutment teeth. Moreover staining, surface roughness, bad odor, tooth debonding, are some additional drawbacks. A very careful treatment plan and perhaps metal framework (except clasps) reinforcement is needed in order this kind of prosthesis to be used.

Purpose: To identify problems associated with thermoplastic resins for non-metal clasp removable partial dentures.

Material and methods: Questionnaires were given to twelve dental laboratories with more than 15 employees in Athens, Greece. Two of these labs were specialized in the fabrication of non-metal clasp removable partial dentures made by thermoplastic resins such as polyamide, polycarbonate or polyethylene terephthalate material. The rest ten labs were operating in the wider spectrum of Prosthodontics. The questionnaires supplied were related to problems and after usage repairs of non-metal clasp removable partial dentures made by thermoplastic flexible resins.

Results: The most common need for repair was the loss of an abutment tooth (50%), followed by the need for rebasing due to loss of the fit (20%). Staining, surface roughness, bad odor, tooth debonding were some more drawbacks associated with that kind of prostheses.

Conclusions: Non-metal clasp removable partial dentures made by thermoplastic flexible resins provides patients with improved esthetics and comfort but having the disadvantages of lacking stability-support create bone resorption and forces and moments at the abutment teeth. Moreover staining, surface roughness, bad odor, tooth debonding, are some additional drawbacks. A very careful treatment plan and perhaps metal framework (except clasps) reinforcement is needed in order this kind of prosthesis to be used.

Objective: The aim of this study is to evaluate the removable partial denture and complete denture needs and relationship between prosthetic treatment, gender, frequency of patients during the period of 2008–2012.

Material and methods: This study was performed on 3453 patients who were applied to the Department of Prosthodontics, Faculty of Dentistry, Marmara University. Gender, prosthodontics treatment were recorded. Thousand three hundred and thirty-seven complete dentures among men is 30% and 70% of women. The prosthetic requirement of patients decreases by mean of years. The denture requirements for women are in higher prevalent.

Conclusions: All types of partial dentures and complete dentures are highly prevalent. On the other hand the numbers of dentures decrease in these 5 years long. A higher frequency of partial and complete dentures are highly prevalent in women.
proximal boxes of posterior fiber reinforced composite (FRC) inlay, fixed dental prosthesis (FDP) using finite element analysis (FEA).

**Material and methods:** Two FRC inlay FDP specimens differentiated by their proximal box dimensions: proximal box software dimensions (PBSD) and the conventional dimensions (CD) were constructed. A 3D scan of the specimens were captured using cone beam computed tomography and by transferring the images to the Abaqus FEA, two 3D finite element models were designed. Then the stress distribution was tested after applying a vertical load of 600 N to the occlusal surface of the pontics.

**Results:** Based on FEA images the maximum stress detected to be on axiopulpal line angle in the PBSD model and on gingival cavosurface of the CD model. For other locations the stress distribution was found to be equal.

**Conclusions:** The software restored dimensions offer the optimum moment of inertia, and maximum bounding surface area for the FDP and minimum sound tooth loss of the pontics comparing to CD, which results in more pulp protection and preservation of tooth structure. Comparison of the stress distribution patterns and the maximum stress points between the two models, offers that PBSD leads to more marginal integrity. Based on the factors that have been considered in programing the software and the result of the current study, this software can be suggested as a guidance in preparing FRC inlay FDP proximal boxes.

**FC333**

**Quality of Life Assessment in Patients with Facial Prosthesis**

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**Aim:** A loss in the face has a functional and psychosocial impact on a patient’s life. Self-image constitutes a personality structure that affects mental life and attitude and is a predictor of the general life satisfaction and the quality of life. The aim of this research was to assess mental health status and quality of life of these patients with facial defects.

**Material and methods:** Seventy-four patients with auricular, orbital, nasal and midfacial defects were examined. General Health Questionnaire and Self-Acceptance Scale were used to assess these patients’ mental health and self acceptance before and after the fabrication of their prosthesis. Additionally, all subjects were asked to respond on a VAS scale for the assessment of their defect and current prosthesis.

**Results:** According to the patients’ responses, the implant group reported higher positive ratings when compared with the adhesive group. Gender, age and defect etiology were found to have significant correlation with the general satisfaction of the patients. There were statistically significant differences in the assessment of mental health and quality of life, depending on the level of self-acceptance. Both the implant and adhesive group rated their prosthetic treatment worthwhile and indicated that they would recommend this treatment to other people.

**Conclusions:** Implant-retained prostheses provide improved perceptions of quality of retention, ease of placement and removal, compliance and overall treatment satisfaction when compared to adhesive-retained prostheses.

**Free Communication Session 52 | B342 | 31.08.2013 | 11:30–12:30**

**Theme:** General Dentistry and Oral Health

**FC334**

**The Effect of Grape Seed Extract on Human Eroded Teeth**

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**Aim:** The aim of this in vitro study is evaluating the effect of Grape Seed Extract on dental erosion in permanent teeth.

**Material and methods:** Twenty sound human premolar teeth were selected. Enamel was completely removed by disk. Teeth were sectioned buccolingually and assigned for microhardness and profilometry tests randomly. All the teeth were placed in Coca-Cola (PH = 2.8) for 5 min and the microhardness and surface roughness were determined in related groups, then teeth were allocated in two groups randomly (n = 10). In group 1 teeth were immersed in GSE (6.5% w/v) for 1 min and in group 2 the same procedure was done for 5 min. The microhardness and surface roughness values were determined again. The results were analyzed by repeated measured ANOVA test.

**Results:** The mean ± SD for group 1 before and after intervention were 45.6 ± 2.04 and 47.6 ± 2.44 accordingly and the difference was significant (p < 0.05), and in second group there were 50.09 ± 4.9 and 53.63 ± 5.81 accordingly and the difference was statistically significant (p < 0.05). There was no significant difference between two groups (p > 0.05). Surface roughness values for group 1 were 0.274 ± 0.196 and 0.282 ± 0.085 before and after intervention. In group 2 there were 0.185 ± 0.077 and 0.165 ± 0.066 in sequence and there was not statistically significant differences in each group as well as between two groups.

**Conclusions:** GSE increased dentin microhardness values in eroded dentin in both one and 5 min duration, and there was not differences between mentioned durations. GSE had no effects on surface roughness in studied groups.

**FC335**

**Effect of Religious Music on Anxiety Level During Dental Extraction**

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**Aim:** The aim of this study is to investigate the effectiveness of religious music in decreasing anxiety level during dental extraction, as dental extraction is one of dental procedures that can
potentially induce dental anxiety that can led to unsuccessful procedure

**Material and methods:** Eighteen subjects aged 19–45 years old, recruited in this study (7 males; 11 females) and divided randomly to one of the following groups: group that listened to classical music (treatment group 1), group that listened to religious music (treatment group 2), and group with no music intervention (control group). All extraction procedures were performed on upper molar region in respect to consistency of difficulty level. Noradrenaline plasma level was used as the indicator of anxiety level and measured by taking blood sample prior to and after the extraction procedure. Statistical Analysis was performed by using ANOVA or Kruskawallis test based on the result of Normality test.

**Results:** There were no significant differences found between the treatment group 1 compared to control group (p = 0.22) and between treatment group 2 compared to control group (p = 0.32), despite of the decreased noradrenaline plasma level showed in the treatment groups. There was no significant difference found between treatment group 1 and treatment group 2 (p = 0.78) despite of the lower noradrenaline plasma level in group 2 compared to group 1.

**Conclusion:** Religious music is proven to be effective in decreasing dental anxiety despite of the insignificant results. Nevertheless, further studies are needed.

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**FC336**

**Measurement of Anxiety Levels in Dental Patients**

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**Introduction:** The behavioral sciences have become an increasingly important component of dental education and research. Fear of dentists and dentistry is a common and potentially distressing problem, both for the public and for community dental practitioners. Anxiety can be defined as a state of unpleasantness with an associated fear of danger from within or a learned process of one’s own environment Anxiety related to dental treatment is a fairly common phenomenon. It is a problem in dentistry, and a notable factor in the avoidance of dental care.

**Objective:** Main objective was to measure the anxiety levels of patients coming to a dental OPD/Teaching Hospital by using Norman Corah’s Anxiety Scale.

**Material and methods:** Dental anxiety was estimated using Corah’s Dental Anxiety Scale (DAS). A total of 166 patients completed the questionnaire regarding their anxiety level and were included as a part of this study.

**Results:** Forty-one percent of the patients belonged to age group of 25–39 years, 37% to age group of 25–39 years, 22% belonged to age group of 40–75 years. Mean anxiety score was recorded as 3.6 ± 3.6.

**Conclusion:** In conclusion an understanding of how anxious patients are when they undergo dental treatment would aid dentists’ efforts to improve patient care.

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**FC337**

**Do saliva Substitutes Have a Preventive Effect on Enamel Erosion?**

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**Objective:** To investigate the effect of saliva substitutes on enamel erosion in vitro.

**Material and methods:** A total of 204 bovine enamel samples were embedded in acrylic resin and allocated to 17 groups (n = 12). The specimens were eroded in an artificial mouth (3 days, 6 × 30 s/day, flow rate: 2 ml/min) using citric acid (pH: 2.5). Immediately after the erosive attacks, saliva substitutes (12 sprays, 3 gels) were applied. Between the erosive cycles, the specimens were rinsed with artificial saliva (flow rate: 0.5 ml/min). A SnCl2/AmF/NaF-containing mouthrinse was used as positive control, water spray served as negative control. Enamel loss was measured profilometrically and the data were analysed using one-way ANOVA followed by Scheffe’s post-hoc tests (p < 0.05).

**Results:** Four saliva substitutes increased enamel erosion, probably due to the low pH or the content of citric acid. Several saliva substitutes were able to reduce enamel erosion significantly by 60–90% (in the range of the positive control). The protective potential of these products was in the range of the positive control (reduction of enamel loss to 30% of negative control). The erosion-protective potential of these high-viscous products is probably related to their film-forming properties, leading to a mechanical protection of the surface.

**Clinical significance:** It can be recommended that patients suffering from xerostomia and at high risk for dental erosion should use high-viscous saliva substitutes, but should avoid saliva substitutes with low pH or containing citric acid.

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**FC338**

**The Incidence and Prevalence of Edentulous in Moldavia According with International Status**

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1Prosthodontic and Implantology Departement, 2Bistatistics Departement

The proper rehabilitation of the partially extended edentulous patient should lead to a state of balance between the elements of the stomatognathic system and the therapeutic option selected, for a period of time as long as possible.

**Aim:** Through the present study we aim at outlining the importance of a general biological perspective on the entire organism, the interrelation between the organism and the stomatognathic system and the necessity of a complex rehabilitation in view of reaching positive and long lasting balance.

**Material and methods:** Three thousand three hundred and forty individuals from the urban and rural areas of Iasi were evaluated. The modality of evaluation was the correlation of the clinical exam with the data from the specially drafted questionnaire in
Aim: Dentin, the predominant mineralized tissue of the tooth, comprises an extracellular matrix of collagen and a heterogeneous mixture of non-collagenous components many of which have cellular signaling properties. These properties may be important in signaling stem cell involvement in tissue regeneration following injury and the present study investigates their morphogenic effects on differentiation of Bone Marrow Stromal Stem Cells (BMMSCs) via the ERK/p38 MAPK pathways. These data indicate that DMPs promote the dentino/osteogenic differentiation of BMMSCs via the ERK/p38 MAPK pathways.

Methods: Non-collagenous dentin matrix proteins (DMPs) were isolated from healthy human teeth and their effects on BMMSCs behaviour examined during in vitro culture and after transplantation in vivo with hydroxyapatite-collagen sponge scaffolds. In vitro, DMPs enhanced alkaline phosphatase activity and mineralization in BMMSC cultures as well as increasing the expression of dentinogenic and osteogenic differentiation markers (including runt-related transcription factor 2, osterix, bone sialoprotein, dentin sialophosphoprotein and osteocalcin) at both transcript and protein levels with 10 µg/ml DMPs being the optimal stimulatory concentration. In vivo, DMPs implanted with a hydroxyapatite (HA) carrier gave rise to deposition of collagen fibrils perpendicular to the implant surface when viewed by polarised light microscopy, an arrangement resembling that of dentin-pulp. In contrast, control HA carrier in the absence of DMPs led to deposition of collagen fibrils parallel to the carrier surface reflecting a more bone-like morphology. Expression of phosphor-ERK/phosphor-P38 in BMMSCs was up-regulated by DMPs and in the presence of the ERK1/2 and p38 specific inhibitors, the differentiation of BMMSCs was inhibited.

Conclusions: With regard to the general condition of the investigated subjects, one can notice a prevalence of a poor general condition in the urban area in proportion of 72.1% as compared to 27.9% in the rural area. The first position in the sphere of general affections is taken by cardiovascular diseases, in both environments, the higher percentage being taken to the urban area.

Conclusions: We need to underline the fact the we need continuity with regard to the prophylaxis of the general and oral condition, the necessity for sanitary education being an essential condition for the increase of the degree of population’s health.

Results: The bond strength values range between 14,949 to 23,879 MPa. The lowest value observed in the Er:YAG laser 150 mJ groups. The Er:YAG laser 450 mJ irradiation was effected on the bond strength significantly (p < 0.05). After Co-Jet sandblasting, the bond strength relatively increased (19,184 MPa).

Conclusion: The Er:YAG laser application enhanced the bond strength of fiber reinforced post to composite resin core with regard to power setting as well as Co-Jet sandblasting.
irradiation with saline, Group 2: syringe irrigation with sodium hypochlorite (NaOCl- 3%), Group 3: syringe irrigation with EDTA (17%), Group 4: irradiated with Photon Initiated Photoacoustic Streaming (PIPS) that presupposes an Er:YAG laser. Twenty millilitre irrigants was used in each group for 5 min. The quantity of remaining Ca(OH)2 in the groove was scored and the data analysed with Kruskal–Wallis test.

**Results:** Our results revealed that removing Ca(OH)2 from artificial standardized groove with different irrigation methods showed no significant differences between groups (p > 0.05). None of the techniques used in this study removed the Ca(OH)2 effectively from an artificial standardized groove.

**Conclusion:** There was no superiority of PIPS on the other methods to remove Ca(OH)2 from artificial standardized groove.

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**FC342**

**Obturation with Single Cone ProTaper Universal Gutta Percha and Glass Ionomer on Mesial Drifted Second Molar**

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**Aim:** Supporting the overlying restoration with the least amount of shrinkage and good adaptation to dentin walls, and used as a lubricant for post and core restoration and was found to coat and protect the apical cone from micro leakage are the characters of Glass ionomer, So we decided to use it in this study. **Case:** This is a study case that we save a tooth with root canal treatment in difficulty condition and situation and also use a new method to seal a canal with single cone protaper universal gutta percha and glass-ionomer as sealer. An 18 year old patient complained of severe pain on the tooth#37, Radiograph examination shows; Mesial inclination of tooth#37 towards the crown of tooth #35 was noted and 3rd molar unerupted, treatment plan was root canal treatment and endodontic treatment after wards.in this case we used the pro taper technique and single cone gutta percha and glass ionomer as sealer for obturation. **Results:** Final radiograph shows that every four canals are completely seal no void and the canals that properly shaped with protaper files are filled appropriately. **Conclusions:** Sealing the gutta percha with Glass-Ionomer Cement gave the clinician the confidence that the obturated canal is protected from possible microleckage coronal to apical.

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**FC344**

**Periodontal Status and Adiposity Status among 12-Year-Old Children in a Population-Based Sample**

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**Objective:** To investigate the association between periodontal health status and adiposity status among children in a population-based study. **Methods:** A random sample of 668 12-year-old school children in Hong Kong SAR, China was recruited. Periodontal status was recorded using the Community Periodontal Index (CPI). Body height, body weight, waist circumference (WC), hip circumference, and triceps skinfold thickness (TRSKF) were performed to assess the adiposity statuses [weight-height ratio (W/H) and body mass index (BMI) for general adiposity; WC and waist-hip ratio (WHR) for central adiposity; and TRSKF for peripheral adiposity]. The relationships between periodontal status and W/H, BMI, WC, WHR, TRSKF were examined in bivariate and regression analyses.

**Results:** The response rate was 76.9% (n = 514/668). Most (85.0%, n = 437) had an “unhealthy” periodontal status (CPI score >0). Logistic regression analyses identified that W/H z-score was associated with “unhealthy” periodontal status in the unadjusted model (OR 1.35, 95% CI 1.03, 1.78, p = 0.03) and in the adjusted model (OR 1.33, 95% CI 1.01, 1.76, p = 0.04), accounting for tooth brushing habit and socio-demographic factors.
Conclusions: Periodontal status was associated with central adiposity (as assessed by waist circumference) among a population-based sample of 12-year-old children in Hong Kong.

Prevalence of Tobacco Related Oromucosal Lesions in South Indian Population

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Aim: To assess the prevalence of tobacco related oral-mucosal lesions among population of an urban area in a South Indian State and to establish the baseline data.

Material and methods: A cross-sectional study was conducted in an Urban area of South Indian State, Andhra Pradesh on 300 subjects using modified 1980 WHO form. The study period was August to October 2012. Prior Permission was obtained from institutional review board (IRB) and informed consent from the study subjects. Subjects were selected using Stratified Systematic Random sampling technique. The urban area which was selected for the study was stratified into four zones i.e., north, south, east and west. Two wards were selected randomly from each zone. Thirty seven to 38 subjects from each ward were included in the study using systematic random sample. The kappa coefficient for intra examiner variability is 0.8. Pearson Chi-square test was used to test the significance. SPSS version 19.0 was used for analysis with 0.05 as cut-off level for statistical significance.

Results: Prevalence of leukoplakia was more in smokers (31%) than in subjects with chewing habit (5%). Oral Submucous fibrosis was observed in 16% of the subjects with chewing habit and none in smokers. Both leukoplakia (8%) and oral submucous fibrosis (25%) were reported in subjects with combined tobacco and alcohol habit.

Conclusion: Leukoplakia and oral submucous fibrosis were the frequently encountered lesions in tobacco users. The findings from this study can be used to design Case-Control and Cohort studies to further investigate the relation between these habits and oral lesions.

The Relationship between Dental Fear, Dental Anxiety and Back Depression

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Aim: The aim of this study was to evaluate and explore the relationship between the levels of dental anxiety, dental fear and back depression and a number of demographic variables, among patients who applied to the clinics of mouth and tooth health center.

Method and materials: This study is done with 231 patients applied between years of 2011-2012. Patients were asked to complete a questionary consisting of the Dental Anxiety Scale (DAS), Dental Fear Scale (DFS), back depression scale (BDS) and questions about age, gender, marital status. The patients were grouped according to gender, marital status. And divided into six age categories. Statistical analysis was made by parametric tests, one way ANOVA, independent test. Also Pearson correlation analyse was made.

Results: The mean DAS score was 10.59 (SD 3.37) for women, 7.65 (SD 2.42) for males, and DFS score was 53.26 (SD 16.7) for women and, 37.57 (SD 13.7) for males. There was statistically significant difference between the mean DAS, DFS scores among age groups (p < 0.05). The mean BDS score was 16.34 (SD 13.1) for women, 9.13 (SD 8.49) for males. There was statistically significant difference between the mean BDS scores of age groups (p < 0.05). There was statistically significant difference between
the mean DAS, DFS ve BDS scores of marital status (p < 0.05). Also correlation was found between DAS, DFS and BDS scores.

**Conclusion:** According to our study results, there was correlation between patients general psychological emotion and DAS and DFS. Youngs and women had had higher scores.

**POSTERS SESSION 04 (P628–P834)**

**Theme: Dental Treatment & Restorative Dentistry: Caries**

**P628**

**Prevalence and Occurrence of Bilateral Caries in First Permanent Molars in 12 Year Old**

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**Aim:** The objective of this study was to find out the prevalence of bilateral and unilateral caries in mandibular and maxillary 1st permanent molars in 12 years old, and to compare them with reference to gender and age.

**Methods:** The study was conducted at Fatima Jinnah Dental College over a period of two (02) years. A convenient sampling method was used to select samples. DMFT levels in a total of 220 respondents were examined. A customized questionnaire was used as data collection tool.

**Results:** The caries found were bilateral. Among the respondents it was found that there was a more frequent occurrence of carious lesions in mandibular 1st molar as compared to maxillary 1st molar.

**Discussion:** The study proved that there is equal prevalence of carious lesions in both genders.

**P629**

**Microleakage in Resin Composite Restorations after Antimicrobial Pre-Treatments: Effect of KTP Laser, Er-YAG Laser; Chlorhexidine Gluconate and Clearfil Protect Bond**

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**Aim:** The purpose of this study was to evaluate the effects of antimicrobial pretreatments [KTP laser, Er-YAG laser, 2% chlorhexidine gluconate and Clearfil Protect bond] on microleakage of Class V composite restorations.

**Material and methods:** Forty-nine human premolars were selected for cavity pretreatment. After Class V cavity restorations on the buccal and lingual surfaces, the teeth were randomly divided into seven groups

1. Group I-Clearfil SE (control)
2. Group II-KTP laser+Clearfil SE
3. Group III-2% chlorhexidine gluconate+Clearfil SE
4. Group IV-Er-YAG laser+Clearfil SE
5. Group V-Clearfil Protect
6. Group VI-KTP laser+2% chlorhexidine gluconate+Clearfil SE
7. Group VII-Er-YAG laser+2% chlorhexidine gluconate+Clearfil SE

The cavities were restored with resin composite. The teeth were then thermocycled for 500 cycles, dried and sealed with nail varnish, leaving 1 mm around the restorations and immersed in 0.5% basic fuchsin for 24 h. They were then rinsed, dried and sectioned, and microleakage was assessed by dye penetration at the occlusal and gingival surface of the teeth using a stereomicroscope (30×). Mann Whitney U Test was used for statistical analyzes.

**Results:** There were no significant differences among the seven groups at the gingival margins and occlusal margins (p > 0.05). Comparing the gingival and occlusal margins in each group, statistically significant differences were found in the control group (p < 0.05) and no significant differences were seen in the other groups (p > 0.05)

**Conclusions:** Microleakage was observed in all groups. The lowest microleakage scores were observed at the occlusal margins of control group. All groups did not show significant differences.

**Theme: Dental Treatment & Restorative Dentistry: Endodontics**

**P630**

**Effects of White Wine on Dental Erosion**

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**Introduction:** Dental erosion is the loss of dental hard tissue whose origin is not linked with caries. It is an irreversible loss occurring due to a chemical process not involving bacteria and is not directly associated with mechanical or traumatic factors. Dental erosion occurs when tooth surface comes in direct contact with acidic substances.

**Purpose:** The purpose of this in vitro study was to assess demineralization of tooth enamel when subjected to white wine.

**Material and methods:** The materials used in the research included 20 extracted human molars. The first group of samples was dipped in white wine for 60 min and for 24 h, while the second group of samples was dipped in white wine and artificial saliva (Biotene) for 60 min and 24 h. Micromorphological changes were tested by the scanning electron microscope (SEM).

**Results:** The width of demineralized areas was measured in the gingival third of the tooth crown.

**Conclusion:** The teeth subjected to 24-h exposures to white wine suffered major enamel damage.

**P631**

**Endodontic Treatment of Teeth with Large Periapical Lesions: Two Cases**

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Introduction: The periapical lesion is frequently associated to an inflammatory response of the organism against a long term endodontic infection. Infections of the dental pulp occur as consequence of caries, operative dental procedures and trauma, etc. These infections often cause total pulpal necrosis and subsequently stimulate an immune response in the periapical region. The latter is commonly referred to as a periapical lesion. Radiographically, the classic description of a lesion is a round or oval, well-circumscribed radiolucent image involving the apex of the infected tooth. This was particularly true if the periapical lesion was suspected to be an apical cyst. In recent years, a greater awareness of the complexities of root canal systems has led to the development of newer techniques, instruments and materials. These developments have greatly enhanced the clinician’s abilities. So periapical surgery is not a general indication for all types of lesions. Because of, this differential diagnosis must be clearly made.

Case: In this presentation, two cases with large periapical lesions healing after non-surgical endodontic treatment is reported. After periapical lesion is diagnosed with clinical and radiographically methods.Convensional root canal therapy planned due to the presence of lesions calcium hidroxide placement is indicated. The patient was recalled 12 months later. In these cases root canal treatment proved succesful the healing of a large periapical lesion.

Conclusion: Root canal treatment using calcium hydroxide as an antibacterial dressing was successful in healing large cyst-like periapical lesions. This support that even large periapical lesions can respond favourably to non-surgical treatment.

P632
Non-surgical Retreatment of a Maxillary Left Incisor Tooth with a Separated File: A Case Report
Buğra Gülér, Taha Ozyurek, Ismail Uzun
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Aim: To describe the non-surgical retreatment procedure of a maxillary incisor with a separated file.

Case: A 34-years-old female patient with noncontributory medical history applied to our clinic with the complaint of pain associated with left maxillary incisor. Clinical examination revealed tenderness to percussion and palpation. Radiographical examination revealed inadequate endodontic treatment, a radiolucent lesion surrounding apex, separated endodontic instrument at the coronal third of the root. According to findings tooth was diagnosed as chronic apical periodontitis and non-surgical retreatment was initiated. Following isolation with rubber dam, the caries was removed and endodontic access cavity was prepared. Examination of the pulp chamber floor revealed an extra root canal orifice located distally. Working lengths were determined by electronic apex locator then root canals were biomechanically prepared and dressed with calcium hydroxide. One week later calcium hydroxide removed and %17 EDTA and %5.25 NaOCI were used for final irrigation. Root canals were obturated with AH Plus and gutta-percha by lateral compaction technique and tooth was restorated with amalgam.

Result: In 3-months follow-up clinical and radiographic examination revealed tooth was asymptomatic and healthy periapical structures.

P633
Three-rooted Mandibular First Molar (Radix Entomolaris): A Case Report
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Aim: To present the diagnosis and root canal treatment of mandibular first molar showing anatomic variations with three roots and four canals.

Case: A 25-year-old female patient was referred to our clinic for root canal treatment of mandibular molar due to symptomatic pulpitis. Clinical examination revealed the pulp was vital, the tooth was tender to percussion not to palpation. Radiographic examination revealed profound dentin caries associated with pulp chamber. Following administration of local anesthesia, the tooth was isolated with rubber dam, the caries was removed and endodontic access cavity was prepared. Examination of the pulp chamber floor revealed an extra root canal orifice located distally. Working lengths were determined by electronic apex locator then root canals were biomechanically prepared and dressed with calcium hydroxide. One week later calcium hydroxide removed and %17 EDTA and %5.25 NaOCI were used for final irrigation. Root canals were obturated with AH Plus and gutta-percha by lateral compaction technique and tooth was restorated with amalgam.

Result: In 3-months follow-up clinical and radiographic examination revealed teeth were asymptomatic and healthy periapical structures.

P634
Endodontic Treatment of Incisors with Dens Invaginatus
Elif Kalyoncuoğlu1, Zeynep Zengin2, Öznur Ozcan1
1Faculty of Dentistry, Department of Endodontics, Ondokuz Mayis University, Samsun, Turkey, 2Faculty of Dentistry, Department of Department of Dentomaxillofacial Radiology, Ondokuz Mayis University, Samsun, Turkey

Aim: To present the endodontic treatment of a mandibular lateral incisor with Type II and maxillary central incisor with Type III dens invaginatus.

Background: Dens invaginatus is a developmental anomaly which occurs as a result of the invagination of the enamel organ.

Case Report 1: A 25-year old man was referred to our clinic with a complaint of spontaneous and severe pain in his lower left lateral incisor. Intraoral examination revealed a morphological alteration in the tooth and it was sensitive to palpation and percussion. Radiological examination showed type II dens invaginatus with an
Evren Sarıyılmaz, Sadullah Kaya, Suzan Cangul, Tuğrul Uzun, Mert Gökay Eroğlu

Endodontic treatment was fundamental to the maintenance of the tooth. The treatments were considered successful.

Case Report 1: A 14-year-old girl was referred to our clinic for a routine dental examination. Radiological examination revealed a morphological alteration in the maxillary left central incisor. Radiological examination showed type III dens invaginatus with an apical radiolucency. Endodontic treatment was recommended. The root canal with dens invaginatus obturation was carried out by the gutta-percha and cold lateral condensation technique with root canal sealer, followed by restoration of the tooth.

Conclusion: Endodontic treatment was fundamental to the maintenance of the tooth. The treatments were considered successful.

Case Report 2: A 15-year-old woman was referred to our clinic for a routine dental examination. Intraoral examination revealed a morphological alteration in the maxillary left central incisor. Radiological examination showed type III dens invaginatus with an apical radiolucency. Endodontic treatment was recommended. The root canal with dens invaginatus obturation was carried out by the gutta-percha and high temperature injectable technique and the other roots obturation was carried out by the gutta-percha and cold lateral condensation technique, with root canal sealer, followed by restoration of the tooth.

Conclusion: Endodontic treatment was fundamental to the maintenance of the tooth. The treatments were considered successful.

The Efficacy of Diode Laser Disinfection on a Periapical Lesion
Mert Gökay Eroğlu

Objective: Disinfection of the root canals is very important for the treatment of periapical lesions. Several materials and methods are using for canal disinfection. The using of diode laser is one of them. In this presentation, the role of diode laser in a periapical lesion treatment with good prognosis will be discussed.

Methods: A 27 year old male presented to Department Of Endodontics with a maxillary right lateral incisor that caused moderate pain. The radiographic examination was performed and a periapical lesion was diagnosed. The patient’s root canal treatment was completed in three clinic visits. Diode laser was used for the disinfection of the root canal during each session. The calcium hydroxide was used only at first visit.

Result: After the treatment protocols, radiographic and clinical follow-up of the patient was performed at 4th, 7th and 12th months. The complete healing of the lesion was observed.

Conclusion: The laser therapy simplifies the root canal sterilization in periapical lesion treatments. Diode laser is a good treatment support for the periapical lesions.

An Unusual Appearance of Hypercementosis Inside a Radicular Cyst
Husniye Demirtürk Kocasarac, Evren Sarıyılmaz, Peruze Celenk, Ugur Mercan, Ali Çağın Yücel

Objective: The aim of this presentation is to report a case of hypercementosis inside a radicular cyst and to give information about the imaging findings.

Introduction: Radicular cysts (RCs) are the most common cystic lesions of the jaws. Its frequency varies from 7% to 54% of periapical radiolucencies. RCs are usually asymptomatic unless seconder infection occurs. If they reach large size, swelling and mild sensitivity may be noted. Hypercementosis is a nonneoplastic deposition of excessive cementum on the tooth roots. Radiographically, affected tooth demonstrates a thickening or blunting in the root. Occasionally the enlargement may resemble a small cementoblastoma. Hypercementosis associated with radicular cyst is not very common.

Material and Methods: An 19-year-old female was referred to our clinic for pain and mobility in her left mandibular anterior teeth. Intraoral examination showed a crown fracture and discoloration in 32. Panoramic and periapical radiographs revealed a periapical radiolucency in 31, 32, 33 and a radiopacity in the root of 32. The teeth were devital. An initial diagnosis of a hypercementosis or cementoma with radicular cyst was made upon clinical and radiological evaluation. Root canal treatments were performed to 31 and 33. Thirty-two was extracted and apical resection was performed to 31 and 33. The microscopic evaluation showed squamous epithelium and toothlike structure.

Results: The microscopic evaluation showed squamous epithelium and toothlike structure. A diagnosis of hypercementosis was made.

Conclusion: Histopathologic examination should be performed to differentiate hypercementosis from cementoblastoma which needs to be removed.
The Efficiencies of Different Techniques in Removal of Calcium Hydroxide Intracanal Medication

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Aim: To evaluate the efficiencies of different irrigation protocols and solutions in removal of calcium hydroxide (Ca(OH)2) from the root canals.

Material and methods: Sixty eight human maxillary central incisor teeth were used. All root canals were prepared using the Mtwo Ni-Ti rotary system up to #40/.06 instrument. The canals were filled with Ca(OH)2 paste. Specimens were randomly divided into two control groups (n = 4), six experimental groups (n = 10) according to irrigation protocols. G1: 1% PAA + #40/.06 K-type hand file; G2: 17% EDTA + #40/.06 K-type hand file; G3: 9% Etidronic acid (EA) + #40/.06 K-type hand file; G4: 1% PAA + ultrasonic activation; G5: 17% EDTA + ultrasonic activation; G6: 9% EA + ultrasonic activation. The cleanliness of root canal thirds were evaluated with SEM analysis. Kruskal-Wallis and Tukey post-hoc tests were used for statistical analysis (p < 0.05).

Results: At coronal thirds; G4 was superior to G2, G3; and also, G1 was superior to G2, G3 (p < 0.05). At middle thirds; G1 and G4 were superior to G2 and G5; and also, G4 was superior to G3 (p < 0.05). There were no significant differences among the rest of the experimental groups (p > 0.05). The frequencies of Score 0 of PAA groups were higher than the rest of groups at all root thirds.

Conclusions: The success rates of solutions used to remove Ca(OH)2 were PAA, EA, EDTA respectively. PAA showed promising results at all root thirds regardless of the agitation technique used.

Knowledge and Attitudes of Turkish Endodontists on Digital Radiological Imaging

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Purpose: The aim of this study was to assess the knowledge and attitudes of Turkish endodontists towards digital radiological imaging (DRI).

Methods: During the 11th Congress of Turkish Endodontic Society in 2012 members were asked to fill in a questionnaire concerning their knowledge and practice in recent imaging techniques and a total of 111 questionnaires were available for the analysis. Chi-square test was used for the statistical evaluation.

Results: The mean age of the endodontists participating in this study was 32.74 ± 10.40 with a duration of practice of 10.33 ± 10.36 years (ranged between 1 and 37 years). 76.6% of the endodontists used DRI in their clinics. Of this group, 63.5% claimed that digital systems increased the number of repetitions of film taking. 70.6% of the endodontists preferred phosphor plate system (PPS), (p = 0.006). When the reason of not using DRI were evaluated according to “year of graduation”, the reason of “being expensive” was found to be statistically significant in the group of graduates over 10 years and 20 years (p = 0.036).

Conclusion: Based on the findings of this study, DRI has been used frequently in the assessment of endodontic pathology and treatment process. The rate of use of DRI seems to depend on the advances of dental faculties, since academicians and PhD students in endodontics department were the main groups participating to the questionnaire. Although use of DRI is increasing, a detailed continuing education programme considering the requirements is still needed.

Treatment of Noncomplicated Crown Fracture after Dental Trauma with the Technique of Reattachment

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Introduction: Crown fractures of the teeth at anterior region is one of the most common injury. The treatment of crown fracture related to trauma is important because of fuctional, phonetic and esthetic reasons. Reattachment technique which menas to restore tooth structure with it’s own tissue; allow a natural appereance to the patients...
who bring the original part of the tooth together. In this study it’s aimed to treat five patients with reattachment technique.

**Case:** Five patients with the age of 8–13 consulted to our clinic after trauma with their own fractured tooth tissue. In the intraoral diagnosis it’s determined that no pulp exposure has become. Fractured tissues attached with adhesive agent and composite resin with reattachment technique.

Any problem was not observed in the interval of 6 months for 1 year control appointments.

**Conclusion:** We are at the opinion that, reattachment technique is an ideal treatment at the patient indicated because of esthetic and natural apperance, biologic compliance and time gaining.

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**P642**

**Sealing Ability of Mineral Trioxide Aggregate or Biodentine for Furcal Perforation Repair**

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Furcal perforation is usually an undesired complication that can occur during endodontic access preparation in multi-rooted teeth. Recently, Biodentine which is an active bio-silicate material has been introduced for dentin substitute wherever dentin is damaged. Inadequate sealing ability of repair materials have affected major changes on poor outcome of repair procedures.

**Objective:** This study was to compare the sealing ability of MTA and Biodentine for furcal perforation repaired in mandibular molars.

**Material and methods:** Seventy extracted mandibular molars, which crown and root intact, without cracked or fracture were prepared access cavities. The root were apically resected for three mm from the root apex. Sixty teeth were made artificial furcal perforation and randomly divided into three groups: Group 1 (n = 25) repaired with Biodentine, Group 2 (n = 25) repaired with MTA and Group 3 (n = 10) as positive control group: no repaired. The remaining ten teeth made available as negative control group. Amount of 2% Methylene blue dye solution were load in upper chamber of experimental model. Leakage of penetrated dye through the repair materials was collected into the water in the lower chamber of experimental model. Optical density of leaked Methylene blue dye was measured everyday by using spectrophotometer at 670 nm for 10 days. Student t-test were used for Statistical analysis.

**Results:** The furcal perforation repaired with MTA has been leaked significant less to tracer dye than those repaired with Biodentine (p < 0.001).

**Conclusion:** It was conclude that MTA demonstrated better sealing ability for furcal perforation repair when compared to Biodentine.

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**P643**

**Retreatment of Two-Rooted Mandibular Canine: A Case Report**

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**Introduction:** It is essential to apprehend the morphology of the root canal system and its variations to accomplish successful endodontic treatment. Anatomic variations and additional root canals can be challenging especially in retreatment cases. Literature indicates the incidence of two-rooted canine as low as 1.7%. This case report represents the successful retreatment of two-rooted mandibular canine.

**Methodology:** A 30-year-old female patient with pain at mandibular left canine was referred to our clinic. The radiographic examination demonstrated incompletely obturated root canals with two-rooted mandibular canine. The clinical examination revealed severe sensitivity to percussion. The tooth was isolated with rubber-dam. The access cavity was prepared. Root canal filling was removed with solvent and stainless steel K and H files. The working length was estimated with radiographic method. Lingual canal was negotiated with size 08 stainless steel K-files to reach the working length. Conventional cleaning and shaping of both the roots were performed and calcium hydroxide dressing was placed in the canals. The tooth was asymptomatic on the second visit. The dressing was removed and after final preparation of the root canals, obturation was done by lateral condensation technique.

**Results:** Eight-month follow-up showed a functional tooth with no symptoms clinically, and a healthy area at the apex.

**Conclusion:** Clinicians should always consider the presence of anatomical variations during endodontic treatment. Despite the low prevalence, variations may occur in the number of roots and root canals of mandibular canines, as demonstrated in this case report.

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**P644**

**Treatment of Tooth with Open Apex Using MTA; A Case Report**

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**Aim:** To present a successful root canal obturation of a tooth with open apex using MTA.

**Material and methods:** A 17-year-old patient refered to our clinic with the complaint of discolored tooth on her left maxillary anterior region. In medical history, the patient stated that she had a history of traumatic injury 10 years ago. During the intraoral examination, a non-vital, discolored tooth (left maxillary central incisor) was determined. In radiographic evaluation, the apex was immature. The root canal was instrumented to remove necrotic pulp and calcium hydroxide was placed as root canal medicament. Calcium hydroxide was changed every 7 days for 2 weeks. In next appointment, the root canal was filled with mineral trioxide aggregate (MTA) and moistured cotton pellet was placed. Access cavity was sealed with temporary filling. In the next appointment, cotton pellet was removed and the root canal access was sealed light cured glass ionomer cement. Then, the tooth was restored with a composite restoration. The patient was recalled for control after 1, 3, 6 and 8 months.

**Results:** In clinical examination the tooth was symptom-free and in radiographic assessment, an amount of apexification was observed.
P645
The Use of White Mineral Trioxide Aggregate (MTA) as Intracoronal Barrier Material in Nonvital Tooth Bleaching
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Introduction: Intracoronal bleeding of teeth may cause external root resorption. The placement of a cervical base material before nonvital bleaching treatment is recommended for preventing cervical resorption after bleaching. The aim of this study was to present the use of White Mineral Trioxide Aggregate (MTA), as isolating barrier to prevent leakage of bleaching agents.

Case: It describes two cases of nonvital bleaching which was performed on a root canal treated, discoloured, maxillary left central and mandibular left lateral incisor. By using white MTA as a barrier, a mixture of sodium perborate and distilled water was used as the bleaching agent. The subsequent follow up visits showed significant improvement in the shade of the bleached teeth even after 12 months, with no external cervical resorption.

Conclusion: Based on our case reports, MTA can be used as a safe intracoronal barrier for nonvital tooth bleaching.

P646
Healing of a Periapical Lesion Following Nonsurgical Endodontic Therapy: A Case Report
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Aim: To describe the endodontic treatment of central and lateral incisors which were associated with a periapical lesion.

Case: Twenty-one-year-old female patient applied to Ondokuz Mayıs University Faculty of Dentistry Department of Endodontics complaining of pain. In clinical examination, both central and lateral incisors were slightly sensitive to percussion and palpation without mobility. Three mandibular central and lateral incisor teeth responded negatively to electric pulp test. In radiographic examination revealed that a diffuse area of bone rarefaction involving the apices of these mandibulary incisors. Sinus tract was observed at the apical portion of teeth over soft tissue. These periapical lesions could not be differentially diagnosed as either radicular cysts or apical granulomas based on radiographic evidence alone. Endodontic access was performed with 31, 41, and 42 using air motor hand piece with water coolant. Root canal preparation was performed with ProTaper rotary system under copious irrigation with 3.25 NaOCl after each file. CaOH paste was applied as intracanal medication. Then the patient consulted with department of periodontology and periodontal treatment was also applied. Tooth was asymptomatic after a week later. Root canals were filled with resin based root canal paste and gutta percha.

Conclusion: Root canal infection could cause periodontal pocket in some cases. These kind of cases could be easily treated with combination of root canal and periodontal treatment.

P647
Management of a Tooth with Endo-Perio Lesion: Case Report
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Aim: To describe treatment of a tooth with endo-perio lesion.

Methods: Sixteen years old male patient applied Ondokuz Mayis University Faculty of Dentistry Department of Endodontics with complaints of swelling and pain.

After clinical and radiographic examination right mandibular first molar tooth had been diagnosed to have perio-endo lesion and root canal treatment was initiated. Root canal preparation was performed with ProTaper rotary system under copious irrigation with 3.25 NaOCl after each file. CaOH paste was applied as intracanal medication. Then the patient consulted with department of periodontology and periodontal treatment was also applied. Tooth was asymptomatic after a week later. Root canals were filled with resin based root canal paste and gutta percha.

Conclusion: Root canal infection could cause periodontal pocket in some cases. These kind of cases could be easily treated with combination of root canal and periodontal treatment.

P648
Long Term Evaluations of In-Office Bleaching Technique of Fluorosed Teeth
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Aim: In this study, 4 year follow up of fluorosed teeth treated with in-office bleaching technique was proposed in terms of the pulp vitality, tooth hypersensitivity and patient’s satisfaction.

Methods: The 98 fluorosed teeth of 17 patients were bleached averagely in eight sessions using in-office bleaching material containing% 35 H2O2. The colored surfaces of the teeth were treated 5 min × 2 in every session. The therapy was terminated after having satisfactory results or when the color change stopped. Pulp vitality, hypersensitivity and satisfaction scores (Visual Analogue Scale (VAS) 0–10) were noted and periapical radiographs were taken to evaluate apical status.

Results: Satisfaction of patients were poor at the baseline (VAS = 0.77) but increased at the end of the treatment (VAS = 9.3). Four years later 12 patients having 50 bleached teeth came to recall visit. Five of the patients requested a new therapy because of the relapse, but the others were satisfied with their teeth. No vitality loss, hypersensitivity or periradicular abnormalities on radiographs were assessed at the end of 4 years.

Discussion: In conclusion, the method used in this study was found satisfactory and successful though the chair time was shorter than recommended, mean VAS score (7.5) of the patients’ satisfaction were still high after 4 years and no pulp or periodontium damage were determined in long term evaluations.
Radiological vs. Electronic Endodontic Working Length Determination in Teeth with Open Apices

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Aim: During root-canal treatment of teeth with open apices, one of the challenges that practitioners face is working length (WL) determination. The aim of this study was to evaluate the accuracy of the challenges that practitioners face in determining WL in teeth with open apices.

Material and methods: Thirty extracted single-rooted permanent teeth were used. Following preparation of access cavities, the root canals were instrumented using #10-140K-files, and the tip of #140K-file was permitted to pass through the apical foramen to a length of 5 mm. Reference length (RL) was determined for each tooth by inserting a #140K-file until the tip was visible at the apical foramen. The radiographic WL was determined using direct (Gendex GXS-700) and indirect (Dürr Vistasonic Mini) digital radiographic systems. Teeth were embedded in an alginate model to test apex locators (Raypex 5, Dentaport ZX, iPex II). Measurements obtained with radiographic and electronic methods were compared to RLs. Data were analysed using Kolmogorov-Smirnov, paired sample t-test and chi-square test (p < 0.05).

Results: Number of accurate measurements obtained with iPex II (n = 9; 30%) was the highest followed by direct digital radiography (n = 3; 10%). None of the electronic measurements was found to be longer than RL, whereas 3 (10%) and 5 (16.7%) of the measurements obtained respectively with direct and indirect digital radiographic systems were longer.

Conclusions: Although iPex II presented the most accurate measurements, none of the methods showed completely reliable results in determining WL in teeth with open apices.
Surgical Removal of Two Separated Endodontic Instruments: A Case Report

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Aim: To describe the surgical removal of separated files in a right maxillary lateral incisor tooth.

Case: A 24-years-old female patient reported herein with a separated file in her maxillary right lateral incisor that occurred 2 years ago during endodontic treatment. Clinical examination revealed no pain to palpation and a buccal sinus tract near the root tip of tooth. The tooth was not tender to percussion. Radiographic examination revealed radiolucency surrounding the apex and two different separated endodontic instruments at the middle and apical third of the root. Following administration of the anesthetic solution and isolation with rubber dam, endodontic access cavity was prepared. First separated file removed with a Hedstrom file but during this procedure other instrument migrated beyond the apex. Then root canal was dressed with calcium hydroxide and the access cavity was restored with temporary filling. At the second appointment a mucoperiosteal flap was elevated and other separated instrument removed surgically. Apex was resected and retrograde preparation was performed with ultrasonic tips and the retrograde filling made with Intermediate Restorative Material. One week later suture was removed and there was no discomfort. Healing of the surgical site was excellent. Then root canal was obturated with injectable gutta-percha and tooth was restored with fiber post and light-cured composite resin.

Result: In the 6-months follow-up after completion of root canal treatment, clinical and radiographic examination revealed tooth was asymptomatic and healthy periapical structures.

An Assessment of Antimicrobial Activity of Three Endodontic Sealers: An In Vitro Study

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Aim: To evaluate the antimicrobial activity of Biodentine, BioAggregate, MTA Angelus by agar diffusion test, using calcium hydroxide as reference for comparison.

Material and methods: Escherichia coli (ATCC 25922), Staphylococcus aureus (ATCC 29213), Pseudomonas aeruginosa (ATCC 27853), Enterococcus faecium (ATCC 9790), Enterococcus faecalis (ATCC 29212), Candida albicans (ATCC 10231) strains were used for this study. Agar diffusion test (ADT) was used for determination of antimicrobial activities of MTA Angeles, Biodentine, BioAggregate and calcium hydroxide. The microorganisms were inoculated in Brucella Broth (BB, Sigma, USA) and incubated for 24 h at 37°C individually. After the incubation period, the broth cultures of microorganisms were adjusted to 0.5 McFarland by using McFarland densitometer. Afterwards, 100 μl aliquots of each bacterial suspension except for C. albicans were streaked onto the Mueller Hinton agar (MHA, Oxoid, UK) surface. C. albicans strain was streaked onto the Sabouraud Dextrose agar (SDA, Merck, Darmstadt, Germany). After incubation at 12, 24, 48, 72 h at 37°C, inhibition zones around the sealers were measured with digital caliper. Each test was repeated three times. For analysis of data Univariate analysis of variance and Duncan Post Hoc Test were performed.

Result: In the ADT, inhibition zones were found with all sealers. All of the sealers showed the highest antimicrobial activity in the 24-h interval. All sealer groups showed statistically different antimicrobial activity individually (p < 0.001). Antimicrobial activity values were ranged BioAggregate, Biodentine, calcium hydroxide and MTA Angelus respectively.

Management of Immature Permanent Tooth with Pulpal Necrosis: 18-Months Follow-Up

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Introduction: The treatment of immature teeth with open apex and pulp necrosis is critical due to difficulties in obturation. Apexification with calcium hydroxide is a conventional method in order to achieve apical closure. This case report describes the treatment of immature maxillary central incisor having pulp necrosis and incomplete apex.

Case: The 12-year old male patient was referred to the endodontic clinic with swelling on the left side of anterior buccal region and a fistula. The patient didn’t report a history of trauma but with his history of orthodontic treatment that had started 15 months before. Maxillary left central incisor that had restored with a big composite restoration was not sensitive to pulp vitality tests. Radiographically maxillary left central incisor exhibited incomplete root formation together with relatively wide root canal. Both central and lateral incisors had large apical radiolucencies. Root canal therapy was performed on lateral incisor by means of chemo-mechanical preparation using K-files and irrigation with 2.5% sodium hypochlorite. A calcium hydroxide paste was applied to the central incisor and changed four times over 12 months. After obtaining complete closure of apical foramina, the root canal was filled by lateral compaction of gutta-percha and a resin-based sealer. An 18-months follow-up revealed normal periapical tissues and the absence of symptoms.

Conclusion: The case presented here supports our knowledge about apical closure induction of calcium hydroxide and its long term success in resolving periapical radiolucency.

CBCT – A Necessary Luxury in the Management of Periapical Lesions

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Aim: Endodontists agree that CBCT is extremely useful in the management of the various periapical pathology and is gradually replacing conventional radiological procedures. The aim of this study is to underline the clinical role of CBCT providing important informations that lead to a correct conduct during endodontic treatment.

Material and methods: Fourteen significant samples from 2010 to 2012 were selected from our personal cases. A preinstalled scanner software was used for image interpretation. The data that we obtained was analyzed with the analyses of variance (ANOVA) test.

Results: In five cases (35.71%) CBCT facilitated the diagnosis between periapical granulomas and periapical cysts, and less than half had endodontic origin. In three cases (21.42%) we were able to identify vertical root fractures. Only one case was confirmed as internal root resorption. In six cases of endodontic retreatments (42.85%) CBCT revealed the presence of additional secondary root canals that were not detected with periapical radiographs. We were also able to discover periapical inflammatory lesions before they appeared on periapical x-rays in four cases (28.57%).

Conclusions: The results of the study confirm that clear diagnostic information lead to a better clinical management of the endodontic problems. Therefore, CBCT has proven to be a valuable and irreplaceable instrument in endodontic practice and not a luxury.

Theme: Dental Treatment & Restorative Dentistry: Esthetics

P656
Treatment of Central Tooth Missing With Direct Composite Resin
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Aim: Diastema is seen such as anatomical differences in tooth size, to be greater the width of dental arch than the size of tooth. Also tooth loss, unerupted teeth and congenitally absence of teeth can lead to the formation of the diastema. The aim of this case report is to explain the treatment of diastema as a result of the upper right central tooth loss with direct composite resin veneer.

Case presentations: Three patients with diastematas together with the loss of the right maxillary central teeth, were referred to the Dicle University Faculty of Dentistry Department of Restorative Dentistry. In clinical and radiological examination, losing of the right maxillary central teeth were seen in patients at younger ages. Treatment alternatives were explain to patients. Then, the joint decision of the patient and the physician’s teeth were restored with composite laminate veneer. With treatment both diastemas closed as well as the loss of central tooth was resolved.

Conclusion: There are different treatment options for diastemas. These treatment options are, direct composite resin veneers, porcelain and composite laminate veneers, orthodontic treatments and prosthodontic treatments. Among these methods direct composite veneers aesthetic, low cost and the most conservative treatment option.

P657
Alternative Restoration Technique of the Damaged Anterior Endodontically Treated Teeth With CAD-CAM And Er,Cr:YSGG Laser
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Introduction: Endodontically treated damaged anterior teeth present specific challenges for the prosthodontists because of their aesthetic needs and structural defects. Preservation of the tooth structure is very important for their protection of integrity under the occlusal forces and aesthetic demands. Longevity of the restoration depends on the appropriate restoration selection. The advances in the adhesive dentistry, ceramic materials and CAD-CAM technology are advantageous for the alternative endocrown restoration techniques. Also improvement of the Er,Cr:YSGG laser makes some advantages for the removal of caries and gingivectomy of the damaged endodontically treated teeth.

Case: In central and canine teeth cases because of the inadequate retained sound tooth structure and the presence of caries laser application is performed. With laser application gingival recontouring for aesthetic is done and the caries was removed by the laser with protecting the sound tooth structure. The alternative endocrown technique comprises a circumferential butt margin and a central retention cavity inside the pulp chamber and constructs the both the crown and core as a single unit with CAD-CAM. Endocrowns made with the feldspatic porcelain CAD-CAM blocs and cemented at the same session.

Conclusion: Endocrown technique is more conservative than traditional post core restorations. With Er,Cr:YSGG laser and CAD-CAM device the restoration could be done easily and in a more conservative way. And the cases presented prove that these technique could be use in the anterior region safely.

P658
Esthetical Approaches Prepared by Two Different Bridge Bodies
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Case: Sixty-year-old male patient, it was determined that there is an extensive mobility and bone loss in tooth no 41 related to chronic periodontitis; and gingival retraction and mobility in the neighboring teeth and for the tooth no 41 removal indication was defined. Also, to recover the esthetical loss related to missing teeth, the patient who lost his tooth no 12 years ago because of tooth decay, in order to restore lateral tooth loss in the upper jaw, it was decided to make an adhesive bridge using a conservative approach. For this purpose, one of the planned adhesive bridge bodies for lower jaw was prepared by his own extracted tooth,
and other planned adhesive bridge body planned for his upper jaw was prepared by strip crown using nanohybrid composite resin. In order to fix the present luxation teeth in the anterior region of the lower jaw, canals were opened in the lingual of the teeth between canin – canin to place polyethylene fiber material and a thin layer of fluid was applied in the lingual surfaces of composite support teeth in the lower jaw and kept waited without polymerized. Then polyethylene fiber was placed through lingual, buried within the fluid composite and a new amount of fluid composite was place on top of it. It was polymerized by LED light. The same procedures for maxillary lateral tooth missing was performed by using strip crown for bridge body and opening canals in palatal region and completed with finishing procedures.

P659
Effects of Staining and Bleaching Procedures on Nano-Hybrid Composite
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Purpose: The purpose of this study was to investigate the effects of three staining solutions and bleaching system on the color change and the surface roughness of a nano-hybrid composite.

Material and methods: Forty disk-shaped specimens of Z550 composite (nano-hybrid, 3M) were prepared. The specimens were then divided into four subgroups (n = 10) and all of the specimens were immersed in three staining solutions (red wine, iced tea and coke) and distilled water (control group) for 7 days. The Office bleaching agent was applied to the surface of the specimens. Color and surface roughness of the specimens were measured at baseline, after staining and bleaching. Data were subjected to analysis of variance for repeated measures among the groups. Multiple comparisons were evaluated by Bonferroni test (p < 0.05).

Results: There was no statistically significant differences between tested groups at baseline, after staining and after bleaching regarding surface roughness (p > 0.05). The highest ΔE values were obtained in red wine group after staining and bleaching procedures. Discoloration values of red wine group were significantly different from the other staining solutions (p < 0.05). Bleaching procedure caused statistically significant color change in only red wine group (p < 0.05).

Conclusion: Staining and whitening procedures didn’t significantly affect surface roughness values of the nano-hybrid composite. Staining solutions except red wine caused imperceptible discoloration values (ΔE < 2).

P660
Evaluation of Intracoronal Bleaching Effectiveness and Chromatic Stability
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Aim: The aim of this study was to evaluate the effectiveness of intracoronal bleaching technique performed with 35% hydrogen peroxide and the chromatic stability after 6 month.

Material and methods: A modified walking bleaching technique involved 35% hydrogen peroxide was used to whiten the discolored one maxillary anterior tooth of 15 patients (age range 30–45). Tooth color was measured baseline (BL), immediately post-bleaching (IP) and 6 months post-bleaching (SP) with a spectrophotometer. The color was determined according to the CIELAB system, which records lightness as L*, a* and b* chromaticity coordinates as a* and b*. The values obtained from these measurements was statistically evaluated with t test match (p = 0.05).

Results: The differences in L*, a* and b* among the three groups (BL, IP, SP) was statistically significant. The results in the study showed that the modified technique using 35% hydrogen peroxide was effective at intracoronal bleaching treatment. Conversely chromatic stability was not enough in this study.

Conclusion: Along with the bleaching treatment, teeth must also be evaluated in terms of impermeability of root canal treatment and microleakage.

P661
Clinical Survival of Indirect Composite Laminate Veneers without Tooth Preparation
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Objective: The aim of this study was to evaluate the clinical performance of indirect composite laminate veneers involving no tooth preparation after 6 month of clinical service.

Material and methods: Laminate veneers were placed on 80 maxillary anterior teeth in 35 patients (age range: 19–45 years) by a single operator following a standardized clinical procedure. The teeth were not subjected to any preparation. Impressions were taken using polyvinyl siloxane impression material. All laminate veneers were fabricated by the same technician using an indirect composite material. A light-cured resin cement was used to lute the restorations. At the 6-month recall, clinical performance was assessed in terms of retention, color match, surface roughness, marginal integrity, marginal discoloration and anatomic form using the modified USPHS criteria.

Results: The retention rate of the veneers was 100%. On the basis of the criteria used, a high percentage of the veneers were rated A score. Veneers maintained their esthetic appearance and no evident marginal discoloration was found. All patients were satisfied with the color match of their restoration 6 month after placement.

Conclusion: It was concluded that this technique represent a reliable and effective procedure for conservative treatment of unesthetic anterior teeth and preserves the patients’ whole natural tooth substance. Appropriate patient selection, indication, and an attentive clinical procedure are needed to ensure success as well.
P662

Restoration of Single Tooth Loss with Fiber-reinforced Adhesive Bridges: Two Case Reports
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Introduction: As an alternative to the traditional restorations in single tooth loss, fiber reinforced adhesive bridges have been developed as more preventive, timesaving and economical method. In this clinical study, there are two case reports with single tooth loss in mandibular molar regions which are restorated with FRC resin bonded adhesive bridges.

Case report: In the first case, a 40-year-old female patient was referred to the clinic in order to eliminate the functional problem occurred because of the previously extracted right first molar tooth due to extensive decay. In the second case, a 24-year-old male patient was referred to the clinic for the rehabilitation of his missing left first molar tooth. The patients were informed about the possible treatment options. Thus it was decided to use a polyethylene fiber reinforced adhesive bridge restorations.

Conclusion: Fiber reinforced adhesive bridges are metal free restorations which have high mechanical and esthetic features. Fiber substructure provides hardness and durability under composite resin, thus this hardness and durability combines with the aesthetic and mechanical feature of composite resin. Also, these restorations are easy to repair and any preparation is needed on support teeth. For this reason, fiber reinforced adhesive restorations are alternative treatment options for patients and clinicians.

Theme: Dental Treatment & Restorative Dentistry: Materials

P663

Effect of Cavity Disinfection Systems on Bond Strength to Caries-Affected Dentin
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Objective: The purpose of this study was to evaluate the different cavity disinfection systems on micro-tensile bond strength (μTBS) of two adhesive systems.

Methods: Forty extracted human molar teeth that have proximal carious lesion were used in this study. The teeth were randomly divided into four groups according to cavity disinfection methods: No disinfection (control), Chlorhexidine, (Cavity Cleaners), Photo-activated disinfection (PAD) (Fotosan), and Nd:YAG laser (Fidelis Plus III). Then, the groups were divided into two subgroups according to adhesive systems (Adper SE Plus and Clearfil S3 Bond) (n = 5). Carious lesions were excavated with Steel Bur techniques. During the caries excavation, a laser fluorescence caries detector (DIAGNoDent) was used to check caries amount. Carious lesions were excavated until the caries detector showed between 11 and 20 laser fluorescence values in the center of lesions. Restored teeth were serially sectioned into beams with a cross-sectional area of approximately 1 mm² at the bonded interface and all samples were submitted to micro-tensile bond test. Data were analyzed using with two-way Analysis of Variance, Kruskall-Wallis, Mann–Whitney U tests (p < 0.05).

Results: Cavity disinfection systems, adhesive systems, and their interaction affected μTBS values statistically (p < 0.05). The bond strengths of Nd:YAG, PAD, Chlorhexidine, and control group were 17.29 ± 6.26, 25.30 ± 9.01, 26.24 ± 8.05, and 32.47 ± 10.78 MPa, respectively. The highest value was observed in the control+ Adper SE Plus group in the disinfection systems+adhesive groups (37.20 ± 11.65).

Conclusion: In cavity disinfection systems, Nd:YAG laser decreased bond strength of adhesive systems.

P664

New Perspectives in Vital Pulp Therapy
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Introduction: This case presents the advantages of Er:YAG laser for deep caries preparation and tricalcium silicate cement (Biodentine) as a pulp capping material.

Case: A 19 years old male came to the Department of Operative Dentistry and Endodontics. He reported for a pain when drinking cold beverages. Clinical examinations showed a wide carious cavity in the right mandibula second molar. The tooth was not sensitive to percussion. The cold test provoked severe pain. Radiographic examination demonstrated a big coronal hard tissue loss close to the pulp chamber and no data for periodontal apical lesion. Considering the findings the concluding diagnosis was reversible pulpitis.

A written informed patient’s consent was obtained. No local anesthesia was used. The preparation of the caries lesion was done only by Er:YAG dental laser. Carious detector was applied. The top of the pulp chamber became very thinner but there was no macroscopic communication. The irrigation was made by 0.9% NaCl water solution. Only sterile cotton pellets were used for drying. The whole cavity was filled with Biodentine. After 1 week part of the cement was replaced by permanent composite obturation.

At the 7th, 30th, 90th day and 6th month the tooth was without any clinical symptoms or radiological data for pathological processes.

Conclusion: The combination of the dental laser excavation positives and the biological properties of new tricalcium silicate cement formula can be the key to successful vital pulp therapy. However, this case is the beginning of further clinical and histological studies with longer follow-up periods and larger samples.
P665
Clinical Evaluation of Patients with GS FIBER POST and GRADIA CORE Over a Period of 1–5 Years
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Aim or Purpose: The aim of this study is to present clinical evaluation of prosthetic treatment of the frontal teeth in patients with GS fiber post and gradia core over a period of 1–5 years.

Material and methods: This study includes a retrospective clinical evaluation of placement GS fiber post and GS gradia core in the prosthetic rehabilitation of 35 patients with fractured upper frontal tooth. Forty-two GS fiber post and GS gradia core were installed between 2007 and 2012.

Conclusions: In our experience we can conclude that the GS fiber post and gradia core are very good method for preprosthetic treatment, MOD onlay with buccal cusp coverage and ceramic fixed-prosthetic restorations (CFPR).

Results: Clinical evaluation included fracture and mechanical resistance of the restorations and control of soft tissue and aesthetics. Radiologically the absence of radiolucency around the fixtures was checked by the observer.

Conclusion: If fiber posts are applied, teeth should be restored with ceramic restorations. Fracture resistance of endodontically treated teeth is dependent on the structures of onlay materials.

P666
Fracture Resistance of Endodontically Treated Premolars Restored with CAD/CAM Onlay Restorations
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Purpose: The purpose of this in vitro study was to evaluate the fracture resistance of endodontically treated premolars restored with CAD/CAM onlay restorations.

Material and methods: Seventy extracted mandibular first premolars were used in the study. Teeth were divided into four groups: intact teeth (control), MOD onlay with buccal cusp coverage, MOD onlay with buccal cusp coverage + endodontic treatment, MOD onlay with buccal cusp coverage + endodontic treatment + fiber post. Except for the control group, other groups were divided into subgroups according to the restoration material: IPS e.max CAD (Ivoclar Vivadent) and Lava Ultimate (3M ESPE). Each group were submitted to 5000 thermal cycles, embedded in acrylic resin and secured in a universal testing machine respectively. A compressive load was applied until fracture, at a crosshead speed of 0.5 mm/min. Statistical significance among each group was analyzed using 1-way ANOVA and Bonferroni tests.

Results: According to statistical analyses, endodontically treated Lava Ultimate onlays had significantly higher fracture resistance than control group (p < 0.05), which also had the lowest resistance average (822.97 ± 345.01 N/mm²). IPS e.max onlays treated with fiber posts had significantly higher resistance averages than that of endodontically treated groups and control group (p < 0.05). Endodontically treated teeth, restored with Lava Ultimate onlays (1380.80 ± 471.69 N/mm²) showed significantly higher resistance averages than IPS e.max CAD onlays (753.12 ± 224.92 N/mm²).

Conclusion: If fiber posts are applied, teeth should be restored with ceramic restorations. Fracture resistance of endodontically treated teeth is dependent on the structures of onlay materials.
Comparative Evaluation for Microleakage Between Glass-Ionomer and Composite Materials

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Aim: To determine the ultrastuctural adhesive surface between composite fillings in deep cavities.

Material and methods: We used 60 intact non carious permanent human third molars, extracted from orthodontic reasons. All specimens were wet-grounded at an angle approximately at 90°C to the long axis of the booth, in order to obtain flat enamel surface. Then all specimens were wet-grounded into enamel and dentin to provide deep cavity. The specimens were divided into tree groups: the first group (FG) specimens were filled with complete adhesive system: 37% H3PO4, adhesive-Excite and composite-Tetric Ceram. In the second group (SG) we used base of conventional Fuji IX, while in the third group (TG) we used resin modified Fuji II LC. Than the deep cavities were filled with base and complete adhesive system – 37% H3PO4 adhesive-Excite and composite-Tetric Ceram. The specimens were analysed with SEM technique.

Results: In the FG the ultra structural SEM analysis demonstrated that there was no microleakage in the bottom of the cavities between dentin and the complete adhesive system. In the SG our results showed microleakage and adhesive type of separation between the dentin and the adhesive system. On the bottom of the deep cavities in the TG there was partially formed hybrid layer, with low level of penetration of the adhesive resin into the demineralised dentin tubules.

Conclusion: The specimens of filled deep cavities without base showed permanent marginal adaptation in comparison with the specimens where the base was applied coated with nail varnish except for one millimeter around the sealant. The teeth were immersed in 0.5% methylene blue for 24 h and then sectioned buccolingually by precision saw, model ISOMET. The sections were analyzed for microleakage under x30 magnification of a stereomicroscope. The Median of microleakage were analyzed by the Kruskal–Wallis statistic among three groups at 0.05 α level and the Mann–Whitney U statistic between two groups at 0.05/3 (3-1) = 0.0083 α level.

Results: Statistical differences in microleakage were found among three materials (p = 0.079). When comparison of microleakage between two groups, significant differences was exhibited between sealants with ACP and sealants with fluoride groups (p = 0.001). There were no significant differences between sealants with ACP and sealants without fluoride (p = 0.047), and also between sealants with and without fluoride (p = 0.079) too.

Conclusion: Resin-based sealants with ACP were higher microleakage than resin-based sealants with and without fluoride releasing.

Influence of Adhesive Application Methods on Microleakage of Bonded Amalgam Restorations

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Aim: To evaluate the microleakage of bonded amalgam restorations using different adhesive materials with different adhesive application techniques.

Material and methods: Class V cavities were prepared on buccal and lingual surfaces of 28 human third molars. Cavities (n = 7) were divided into one control and three application groups per adhesive material (Scotchbond Multi-Purpose/3M ESPE; XP Bond/Dentsply) employed, as follows: control group: no adhesive material was applied under amalgam restorations, Group1: (Light cure) adhesive materials were applied in light cure mode; group2: (Chemical cure) adhesive materials were applied in chemical cure mode; group3: (light cure+chemical cure) adhesive materials were applied in light cure mode then adhesive materials were reapplied in chemical cure mode. After adhesive applications amalgam (Dispersalloy/Dentsply) was condensed and carved. After storage for 24 h in distilled water at 37°C, restorations were finished and polished. The teeth were then thermocycled (500 cycle at 5–55°C), and the specimens were examined for microleakage using methylene blue as a marker.

Results: Compared to control group adhesive application methods significantly reduced the microleakage (p < 0.05). For Scotchbond Multi-Purpose Group1 showed significantly highest microleakage than the other groups in enamel and dentin margins, however for the XP Bond the same effect was shown in enamel margins (p < 0.05). There was no significance between Group2 and Group3 for both dentin adhesives.

Conclusion: Adhesive systems had a significant effect on microleakage of Class V amalgam restorations. The influence of the chemical cure and light cure+chemical cure was significantly greater than only light cure application of adhesive systems.
Purpose: To evaluate the preliminary results on the fracture resistance of teeth restored with formerly manufactured, ready-to-use core build-ups and prefabricated posts.

Material and methods: Fifty recently extracted caries-free maxillary canine teeth were selected and decoronated at the cemento-enamel junction. Following endodontic treatment and post space preparations quartz fiber-reinforced posts were cemented to all the root canals and were embedded into acrylic resin molds. The roots were then assigned to five experimental groups (n = 10). Four dental blocks of different composition have been used as core build-up materials and standard cores were individually milled from quartz fiber, resin nanoceramic, feldspathic and leucite-reinforced glass ceramic materials (Groups 1–4). Post heads of each post was cemented to the specially prepared post head space in the core build-up material. In group 5, composite resin cores were directly formed as the control group. All specimens were compressively loaded at 135° angle in a universal testing machine at a crosshead speed of 1 mm/min until fracture. Data obtained were analyzed statistically using ANOVA followed by Tukey HSD multiple comparison tests.

Results: Mean failure loads (Newtons) calculated for groups 1–5 respectively, were 721.2N, 712.5N, 671.8N, 688.7 and 642.6N. No statistically difference was observed among the groups (p > 0.05). Fractures that would allow repair of the tooth were observed in all five groups.

Conclusion: The results of this study can be attributed as formerly milled core build-ups could serve as an effective, contemporary and time-saving method for the restoration of endodontically treated teeth restored with prefabricated post and core systems.

Inhibitory Effect of Quaternary Ammonium Methacrylates on Dentin Protease Activity

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Objective: Quaternary ammonium methacrylate (QAM) addition to comonomer blends has been shown to provide anti-microbial and anti-MMP properties. Aim of this study is to determine the inhibitory effects of various concentrations of a QAM-incorporated experimental resins on MMP and cathepsin-mediated dentin protease activity.

Methods: A commercial QAM methacryloyl choline methyl sulfate (MCMS) was added to co-monomer mixtures of TEGDMA (30 wt%), HEMA (10 wt%), and BisGMA (wt% varied) at 0, 5, 10, 15 wt%. Demineralized dentin beams (6 x 2 x 1 mm, n = 10/group) were divided into five groups. After initial dry mass measurements, rehydrated beams were dipped in (1) 5% QAM, (2) 10% QAM, (3) 15% QAM (4) non-QAM control (NQC) for 15 min, followed by a series of acetone rinsing and water rinsing to remove the resin. Demineralized beams with no pretreatment were used as control (AS). Beams were incubated in calcium-zinc containing incubation media (pH 7, 37°C) for 24 h days. After incubation period dry weight of the beams reassessed and aliquots of the incubation media were analyzed for pyridinoline-crosslink-containing degradation fragment of the C-terminal telopeptide of type I collagen (ICTP) as a determinant for MMP-mediated degradation and deoxypyridinoline-containing degradation.
degradation fragment of C-terminal telopeptide (CTX) as a determinant for cathepsin-mediated degradation using ELISA kits. The data were analyzed using ANOVA, \( \alpha = 0.05 \).

**Results:** Mass loss, CTX and ICTP release decreased significantly with the increasing QAM concentrations (\( p < 0.05 \)) after 24 h of incubation. Mass loss ranged between 7% for AS to 3% for (15% QAM).

**Conclusion:** Higher concentrations of QAM could inhibit MMP or cathepsin-mediated degradation of dentin matrix.

P674
The Effects of Nitride Ceramic Coatings on Dental Alloy
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**Aim:** The main purpose of this study was to investigate the effects of nitride ceramic coatings on surface hardness and topography of Ni-Cr dental alloy. In addition, an evaluation on the adhesion forces of the nitride coatings to dental alloy was performed.

**Methods:** A total of 45 disc-shaped specimens were prepared from Ni-Cr alloy and metallurgically polished in order to obtain mirror finish. Specimens were randomly divided into three groups (\( n = 15 \)). One of them was used as the control group. Other groups were coated with TiN and TiAlN by PVD magnetron-sputtering technique. Hardness measurements were performed using nanohardness and microhardness testers. Adhesion forces of the coatings on Ni-Cr alloy were measured by a scratch tester. Experimental data were analyzed statistically with ANOVA. Surface morphology and coating thickness were evaluated by SEM images.

**Results:** TiN and TiAlN coated specimens were found six to eight times harder than the Ni-Cr alloy (\( p < 0.001 \)). TiN coating was found harder than TiAlN coating, but the difference was not statistically significant (\( p > 0.05 \)). TiAlN coating exhibited significantly higher adhesion forces to dental alloy than TiN coating (\( p < 0.001 \)). SEM analyses showed that both coatings have homogen, smooth and non-cracked surfaces and approximately 2 \( \mu \)m thickness.

**Conclusions:** Nitride ceramic coatings can be successfully deposited on Ni-Cr alloy and they can be adhered strongly onto the alloy. Therefore, these coatings may be used to improve hardness of Ni-Cr alloy in order to prevent alloy surface from mechanical damage and wear.

P675
Inactivation of Dentin Protease Activity by Photo-Activated Riboflavin
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**Objective:** The acid-etching step of the contemporary dental adhesives known to activate endogenous protease activity of dentin, which in part plays an important role in the degradation of hybrid layers. Previous studies suggest the successful use of collagen crosslinkers for inactivation of dentin metalloproteinase activity. Aim of this study is to investigate the effect of riboflavin pretreatment on degradation of dentin collagen by cysteine cathepsins.

**Methods:** Demineralized dentin beams (2 x 1 x 6 mm/n = 10/group) were distributed in five groups with regard to their initial dry weight. Each group were subjected to 1% or 5% riboflavin or riboflavin-phosphate under UVA (365 nm, 7 mW/cm\(^2\)) for 5 min and then incubated in a simulated body fluid (SBF, 1 ml) for 3 days. The groups with no pretreatment were used as control (CM). Aliquots of media were analyzed for deoxypyridinoline-containing degradation fragment of C-terminal telopeptide (CTX) as a determinant for cathepsin-mediated degradation using ELISA kit (Serum Crosslaps, Immunodiagnostics, UK). Also, dry weight loss of dentin beams was assessed after 3-day incubation. Data were analyzed using ANOVA at \( \alpha = 0.05 \).

**Results:** The CM group showed significantly higher dry weight loss compared to pretreatment groups (\( p < 0.05 \)). Similarly, control showed significantly higher CTX (503.44 pg/mg dentin) (\( p < 0.05 \)) release compared to pretreatment groups (range 68–153 pg/mg dentin).

**Conclusion:** The study showed that both riboflavin and riboflavin-phosphate can effectively inhibit cysteine cathepsin-mediated dentin protease activity.

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P676
Temperature Effects on the Rheological Properties of an Elastomeric Impression Material
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**Goal:** Rheological properties are regarded as major influencing factors which influences the accuracy of an impression material. Because temperature may affect properties and the setting kinetics, clinically relevant inferences may not be accurate with studies conducted at room temperature. The purpose of this study was to investigate the effect of temperature increase on the rheological properties and viscoelastic behaviour of a new elastomeric impression material.

**Methods:** The impression material used in our study is polyvinyl siloxane called AlgInot (Kerr Corp, Romulus, MI) that is presented as an alternative to alginate for preliminary impressions as
it offers more dimensional stability and reliability. The storage modulus ($G'$) and the loss factor ($\tan \delta$) were measured from 30 s after mixing during setting, using a controlled stress rheometer in cone-plate configuration in oscillatory mode. Viscoelastic properties were evaluated by means $G'$ and $\tan \delta$ from five repeats each at 25°C, 33°C and 37°C. All data were statistically analyzed.

**Results:** The temperature studies revealed significant changes in the kinetics of setting, with the setting time decreasing between 25°C and 37°C. The kinetics of the setting reaction increase significantly with temperature for the material as revealed in the time course of the increase of $G'$. The change of loss factor $\tan \delta$ during setting varied.

**Conclusions:** Within the limitations of this study, the polyvinyl siloxane impression material showed temperature sensitivity of the setting kinetics and its rheological properties. The dynamic characterization of dental impression materials is important in the design and selection of suitable materials for clinical applications.

**P677**

**Surface Hardness of Light and Dual Cured Composite Resin Luting Cements**

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**Objective:** The aim of this study was to evaluate the effect of different light irradiation time such as 20 s, 40 s, 60 s on surface hardness of light and dual cured composite resin luting cements beneath 2 mm indirect composite resin restorative material.

**Material and methods:** For each test group 5 specimens were prepared and Vickers surface hardness measurements were performed on upper and lower surfaces of test specimens with different intervals such as 10 min, 24 h and 1 week after light irradiation. Light cured (NX 3, Nexus) and dual cured (NX 3, Nexus) composite resin luting cements were polymerised 20 s, 40 s and 60 s by LED light curing unit (Elipar FreeLight 2). Additionally, same luting materials were polymerized beneath 2 mm indirect composite resin restorative material (Paradigm MZ 100).

The data were analyzed with three-way ANOVA, $t$-test, and oneway ANOVA.

**Results:** Light irradiation without indirect composite resin restorative material at 10 min, 24 h and 1 week and at three different irradiation time intervals, Vickers Hardness Number (VHN) of light cure luting cement was higher than dual cure luting cement at both upper and lower surfaces of the test specimens ($p < 0.05$). All tested groups, VHN was increased at 24 h compared with 10 min results ($p < 0.05$). Light irradiation beneath indirect composite resin restorative material at different three irradiation time intervals for both luting cements VHN was decreased ($p < 0.05$).

**Conclusion:** VHN decreased under indirect composite resin restorative material curiously at lower surfaces for both luting cements.

**P678**

**Evaluation of Vickers Hardness and Depth of Cure of Different Bulk Fill Composites after Aging**

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**Aim:** This study was examined the surface microhardness of three kind of bulk fill composites (Surefil SDR flow, Tetric Evo Ceram, Xtra base).

**Material and methods:** Ten specimens of 2, 4 mm thickness and 4 mm diameter of each bulk fill composite were polymerized using a halogen light and a blue light-emitted diode. Microhardness evaluation was performed at the top and bottom surfaces for each specimen using a Vickers microhardness tester. Furthermore, morphologies of the polished top surfaces of bulk fill composites were observed using scanning electron microscopy (SEM).

**Results:** The bottom surface measurements were evaluated, except for the Voco 2 mm thickness example polymerized with LED and halogen groups, no significant difference was found in all the composite groups ($p > 0.05$). Tetric composite group showed the highest microhardness values. The statistical evaluation taking into account the thickness of the composite samples, the top surface microhardness values found statistically significant difference between 2 mm and 4 mm thicknesses of the Voco composite samples ($p < 0.05$). In the other composite groups, these values were not found to be significant differences ($p > 0.05$).

**P679**

**Effect of Different Tooth Preparation Timings of Tooth Preparation on the Coronal Microleakage of Fiber Post**

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**Objective:** The vibration of high speed handpiece during tooth preparation may have adverse effect on the continuous force of the bonding interfaces among the cement, dentin, and post core. To find the effect of different tooth preparation timings on the coronal microleakage of fiber post to provide evidence for the clinical operation.

**Methods:** The extracted mandibular premolars were divided into two groups, and they were prepared immediately and 24 h after the cements mixed. All roots were then dyed. The teeth were observed under stereoscopic microscope and the dyeing scores were also recorded.

**Results:** There is significant difference on the coronal microleakage of tooth preparation timings. Group of prepared after 24 h got the lower scores.

**Conclusion:** It is more conducive to the post-core bond after 24 h tooth prepared.
Dental Filling Materials Can Cause Oxidative DNA Damage
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Objective: The purpose of this study is to examine the effects of two restorative materials [composite (Filtex Z250™, 3M ESPE, St Paul, MN, USA) and amalgam (Cavex Avalloy, Cavex, Holland)] and substances secreted by them to the oral environment on lipid peroxidation and DNA oxidation after they pass to the blood circulation.

Material and methods: Blood samples of 41 patients were obtained before the application of these restorative substances (19 amalgams and 22 composites) and 24 h after this application. In these samples to determine oxidative DNA damage the ratio of 8-hydroxydeoxyguanosine (8-OHdG) was measured and to define lipid peroxidation the malondialdehyde (MDA) level was measured. Statistical analysis was performed in SPSS 16.0. For analysis of the variables, Wilcoxon signed rank test was used and p < 0.05 was referred as significant statistically.

Results: While no statistical significance was observed before and after amalgam filling application (n = 19) in the name of DNA oxidation (1.26 ± 0.16, 1.38 ± 0.46 respectively), MDA concentration was significant statistically (5.64 ± 2.53 μM, 9.78 ± 3.50 μM respectively, p < 0.001). In composite application, a significant difference was observed before and after application in DNA oxidation (1.28 ± 0.23, 1.46 ± 0.31, respectively, p < 0.05). On the other hand, even though an increase was seen in MDA concentrations no statistical significance occurred (6.59 ± 3.37 μM, 7.94 ± 5.24 μM respectively). No relationship between the mass of filling substances and secreted contents was determined.

Conclusions: In the light of these results, we could say that Hg determined.

Compoglass F showed the highest radiopacity value among the materials tested, whereas two different colours of Twinky Star Flow showed the lowest. All tested materials had radiopacity values greater than the radiopacity of dentin and higher than 1 mm thickness of Al.

Microhardness of Resin Cements Polymerized Through Different Shade Composite Discs
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Aim: The aim of this study was to evaluate the degree of conversion and microhardness of different resin cements that polymerized through different shade composite discs with QTH and LED curing units after 1 and 24 h.

Material and methods: Two different shades of composite discs; light (Clearfil Majesty esthetic (XL), Kuraray, Japan) and dark (Clearfil Majesty esthetic (C3), Kuraray, Japan) were prepared with metallic molds of 1 mm in depth and 5 mm in diameter. Three different resin cements (Panavia F, Kuraray; SA Cement, Kuraray; Permablo DC, Ultradent) were placed in metallic molds of 1 mm in depth and 5 mm in diameter and polymerized through the prepared composite discs with QTH and LED curing units. The resin cement specimens were stored at 37°C in dark for 1 and 24 h. Vicker’s hardness measurements were performed. A 100 g load was applied to samples with a dwell time of 10 s. Three indentations were made on upper and lower surface of each specimen. A bottom to top Vicker’s Hardness Number (VHN) ratio was determined. The data was statistically analysed by ANOVA and Tukey HSD test.

Conclusion: There were significant differences between resin cements (p < 0.05). Degree of conversion of resin cements polymerized through XL shade was significantly higher than resin cements polymerized through C3 shade (p < 0.05). There was no significant difference between the light curing units.

Radiopacity of Compomer Restorative Materials Using Digital Radiography
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Aim: The aim of this study was to evaluate the radiopacity of different compomer restorative materials using a digital imaging system.

Material and methods: Ten standard disk specimens (5 mm diameter, 1 mm thickness) were prepared from each of the following restorative materials: eight different colours of Twinky Star (Voco), two different colours of Twinky Star Flow (Voco), Dyraf Flow (Dentsply), Dyraf XP (Dentsply), Glassiosite (Voco), Compoglass F (Ivoclar Vivadent) (n = 140). Radiographs of the specimens were taken together with tooth slices and an aluminum (Al) step wedge calibrated in millimetres (1–15 mm, 1-mm increments) as reference using Durv Vistascan Mini digital imaging system. For the radiographic exposures, a storage phosphor plate (size 4; 5.7 × 7.6 cm) and a dental x-ray unit at 70 kVp and 7 mA were used. The object-to-focus distance was 30 cm, and the exposure time was 0.2 s. The grey values of the test materials were measured digitally using the histogram function of the system’s own software (DBSWIN 5.2.0) and compared with the step wedge to find the equivalent thickness. Data were analysed with significance levels set at p < 0.05.

Results: Compoglass F showed the highest radiopacity value among the materials tested, whereas two different colours of Twinky Star Flow showed the lowest. All tested materials had radiopacity values greater than the radiopacity of dentin and higher than 1 mm thickness of Al.

Conclusions: All of the compomer materials evaluated met the minimum radiopacity standard recommended by the International Organization for Standardization and the American Standards/American Dental Association.
P683
Low-Shrinkage Composites: Microleakage and Marginal Adaptation
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Introduction and aim: Silorane-based composite is a novel low-shrinking material produced in attempts to reduce problems associated with polymerization shrinkage of methacrylate-based composite resins. Silorane is obtained from the reaction of oxirane and siloxane molecules. Oxirane is a monomer with ring-opening polymerization, which causes lower amount of polymerization shrinkage than conventional methacrylate-based resin matrix. The siloxane backbone gives hydrophobicity to this resin-based material. Methacrylate-based composites have average polymerization shrinkage of 1.5–6 vol%, whereas silorane-based composite has an average shrinkage of 0.9 vol%.

Material and methods: For this research we used online database and search engines as Pubmed, wiley, and articles from 2000 to 2013 have been considered.

Result: Silorane exhibited significantly decreased microleakage and increased marginal adaptation compared with any other composite (RBC).

Conclusion: Although all of the restorative systems had microleakage, silorane technology showed less microleakage comparable to clinically successful methacrylate-based composite. This will improve the clinical performance and extend the composite durability.

P684
Dental Amalgam Waste Management by Dentists in East Africa
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Aim: The aim of the study was to evaluate the current practices of dental amalgam waste management by dentists.

Material and methods: All the 1028 dentists who were registered with the regulatory bodies in the three selected countries Kenya (565), Uganda (300) and Tanzania (189) constituted the sample. Authority to conduct the study was obtained by United Nations Environmental Programme from the respective Ministries of Environment in the three countries. Questionnaires were administered using on line web-based Survey Monkey software. Respondents were followed up with multiple reminders. Data was exported and analysed using SPSS.

Results: A total 188 dentists logged into the web but only of 68 dentists completed the questionnaire, males 41 (60.3%), females 19 (27.9%), with 45, 5 and 15 being from Kenya, Uganda and Tanzania respectively. Majority 63 (92.6%) used dental amalgam, 95.6% knew measures of minimizing amalgam waste, however 22 (32.4%) used bulk elemental mercury and alloy powder, 46

(67.6%) discarded waste amalgam with sharps, hazardous and general and waste and only 18 (26.5%) immersed waste amalgam in sealed containers. No dentist reported knowledge of a recycler in the region and only 19 (27.9%) planned to install separators.

Conclusion: Most dentists were aware of methods of minimising waste and a minority handled contact and non-contact waste appropriately, however majority did not handle waste according to best management practices.

Theme: Dental Treatment & Restorative Dentistry: Pedodontics
P685
Interleukin-1β and VEGF Levels in Gingival Crevicular Fluid in Children with Epilepsy
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Background: Interleukin-1β (IL-1β), a proinflammatory cytokine, and vascular endothelial growth factor (VEGF), an angiogenesis cytokine, levels in gingival crevicular fluid (GCF) are affected by some systemic diseases. The aim of this study was to evaluate the IL-1β and VEGF levels in GCF in epilepsy children.

Material and methods: Twenty-four epilepsy children in free seizure period and 20 healthy children were evaluated. Gingival index (GI), plaque index (PI), probing depth (PD), clinical attachment level (CAL) were measured. GCF was collected by periopapers and its volume was measured with the Periotron 8000. GCF IL-1β and VEGF concentrations were analyzed in Biochemistry Laboratory and measured by ELISA method.

Results: Total amounts of IL-1β and VEGF in GCF in epilepsy patients were significantly higher compared with healthy children (p < 0.0001). Clinic parameters, that were GI, PI, PD and GCF volume in epilepsy cases were significantly higher than healthy children. CAL were <2 mm for all children. When the patients were divided into groups according to the drug used, there was not any significant differences in GCF IL-1β and VEGF levels among drug groups. According to these results it may be suggested that in epilepsy patients needs optimal oral care.

P686
The Configuration of Teeth with Complete Structural Integrity Which Have Shape Anomaly with Resin Based Composite Restorations: Five Case Reports
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Introduction: The congenital or acquired anomalies like common decays at anterior teeth, diastema, cross-bites, hypoplasia, flourosis may cause esthetic problems.
Case: In this study, it’s aimed to eliminate the esthetical complains of five patients at the age of 12–16 with conservative treatments. Some changings were made at location of the teeth with preparation but at some of the patients, changings were made without preparation. Than teeth restored with composite material. Controls were made at the intervals of 6 months for 1 year and any significant colour changings or restoration fractures were not determined.

Conclusion: We are of the opinion that at the esthetic problems caused of dental size-shape anomaly may be restored with composite restorations rapidly, economically and effective.

P687
Camouflage Treatment at the Patient Who Have Dental Discoloration Because of Different Reasons: Five Case Reports
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Introduction: Dental discoloration may occur because of dental hypoplasia, fluorosis, amelogenesis imperfecta, dentinogenesis imperfecta, definitisation. In this study it’s aimed to treat the dental discoloration of five different patients with conservative treatments.

Case: Patients at the age of 12 and 16 were consulted to our clinic with esthetical concern. After the intraoral examination, it’s decided to camouflage the discoloration with composite material. Two of the patients have discoloration because of endodontic treatment and three of the patients have discoloration because of fluorosis and hypoplasia. Neither vital nor nonvital bleaching technique were used. Teeth were prepared and restored with composite restorations at one session. Patients were seen in the interval of 2 months for 1 year and no complains were observed.

Conclusion: We are at the opinion of camouflaging these teeth with composite restorations without prosthodontic treatments.

P688
Oral Rehabilitation of 4 and 5-Year-Old Two Lactose Intolerant Patients
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Introduction: The effect of diet is an important factor that affect dental caries. In our study main purpose is to perform the treatments of two patient have lactose intolerance. The intraoral examination revealed that all of the teeth except for primary incisor and primary canine are carious. The restorative treatment of carious teeth were performed. Follow-up was decided for upper primary teeth.

Case 1: A 4-year-old female was referred to our clinic because of dental pain. Intraoral examination revealed that all of the teeth except for primary incisor and primary canine are carious. Intraoral examination revealed that all of the primary molar teeth are carious. The conservative treatment of carious teeth were performed.

Conclusion: We are of the opinion that, it’s important to diagnose and treat the pulp pathology and dental destruction while orthodontic treatment.

P689
Rehabilitions of Dental Tissue Defects and Pulp Pathology Noticed While Orthodontic Treatment
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Introduction: Many variance may become while orthodontic treatment at periodontal and tooth tissue. These variances may cause many problems. In this study it’s aimed to make the treatments of two patients with problems of dental hard tissue or pulp pathology.

Case: Two patients at the age of 14 male and 16 female consulted to our clinic with the complain of dental pain while orthodontic treatment. Intraoral and radiographic diagnosis were made and it’s detected at one of the patient absence formation caused by pulp pathology and at the other one dental tissue destruction. The endodontic and restorative treatments were performed. After performing the endodontic and restorative treatments, in the interval of 3 months for 1 year, no symptoms were observed.

Conclusion: We are at the opinion that, it’s important to diagnose and treat the pulp pathology and dental destruction while orthodontic treatment.

P690
Oral Health Status of Children in Pediatric Dentistry Clinics, Istanbul
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Aim: The objective of this study was to assess the oral and dental health status of 2–6 years old children attended to the Clinics of Department of Paediatric Dentistry, Istanbul University, Istanbul.

Methods: A random sample of 100 children aged 2–6 years (52 boys, 48 girls) visited the Dept. of Pediatric Dentistry, Istanbul University in 2012 were evaluated for caries indices (dfs), plaque index (Pl); and oral health attitudes, feeding practices were also assessed by a questionnaire. The findings were analyzed statistically by chi-square test (NCSS 2007 & PASS 2008 Statistical Software).

Results: The caries prevalence was determined as 99%; the mean dfs, Pl were determined as 8.17, 17.85, 1.03; the mean dft,
Assessment of Odontogenic Infections in Pediatric Patients

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Aim: The aim of this study was to evaluate the characteristics of odontogenic infections which have great importance in oral and general health of children.

Methods: The characteristics of oral and maxillofacial odontogenic infections diagnosed during the initial examinations of 150 pediatric patients aged 3–15 years old (84 girls, 66 boys) in the Clinics of Department of Pediatric Dentistry, Istanbul University, Turkey, were assessed in this study.

Results: The mean age of study group was 7.12 ± 2.6 years. Systemic health problems were reported for 21 (14%) patients. The great majority of cases were diagnosed with intraoral abscesses (85.33%) and 22 patients with extroral abscess (14.66%). The focus of infection was mandibular in 84 patients (56%) and maxillary in 66 patients (44%). The mandibular second primary molar was the most commonly infected tooth (43.04%) and six patients (4%) had infection in more than one site. The most frequent cause was pulp necrosis due to caries (92%). Pain was reported by 99 patients (66%); other signs and symptoms recorded were lymphadenopathy (24.66%), high fever (10%) and trismus (6%). The management included extraction in 72 patients (48%), and endodontic treatment in 71 patients (47.33%).

Conclusions: The data has emphasized the comprehensive caries prevention and management strategies in populations.

Bulk-Fill Flowable Composite Liner for Pulpotomized Primary Teeth

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Objective: The present study determined whether primary molar pulpotomies showed equal in vitro and clinical success when restored with sandwich restoration with a bulk-fill flowable composite (BFRBC) liner vs. a stainless steel crown (SSC) restoration.

Methods: Sixty extracted human primary second molars with proximo-occlusal cavities were selected for in vitro test. The specimens were randomly divided into three groups (n = 20) and restored with sandwich restoration with a BFRBC liner, composite (RBC) restoration and SSC. In addition, sixty teeth were selected from 20 children and each child had at least three primary molars (first and/or second primary molar) requiring pulpotomy. The patients were recalled for clinical and radiographic evaluation at approximately 6- and 12-month intervals.

Results: The SSC restoration had significantly higher microleakage than the others. Although there was a significant difference between the RBC and the SSC (p = 0.02), the differences between the BFRBC and the RBC, as well as between the BFRBC and the SSC, were not statistically significant level, at the 12-month radiographic evaluation (p = 0.33 and p = 0.11, respectively).

Conclusion: The use of BFRBC in resin-based composite restorations appears to be a successful component in the final restoration of pulpotomized primary molars.

A Conservative Approach for Treating Cystic Lesions Blocking Eruption in Children: Eight Case Reports

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Introduction: Radicular and dentigerous cysts are the common types of cystic lesions occurring in jaws, and account for approximately 50% and 25% of the jaw cysts respectively. Several treatment options include complete enucleation and marsupialization. If preservation of the displaced teeth is desirable, and in a young patient where the lesion is isolated, marsupialization of the cystic lesions of the jaws is the technique that relieves the pressure within the cystic lesion and causes some decrease in size of the lesion. Thus the optimal treatment option for the dentigerous cysts in the children is marsupialization because of the mixed dentition.

Case: Totally eight child patients came for a dental check-up to Department of Pediatric Dentistry, 19 May University. We diagnosed lesions in those patient by intraoral and radiographic identification. Dentigerous cysts were found in six patients and radicular cysts were found in two patients. All patients were treated with marsupialization in Department of Oral and Maxillofacial Surgery. In some patients, we used dental shutter which made from acrylic resin to provide tunnel for a long time without spontaneous closing. After mean 12 months of following, spontaneous eruptions of displaced tooth, fully healing of bone and relieving of all symptom relating to lesions were noticed.

Conclusion: In conclusions, marsupialization especially using dental shutter might be the first treatment option for conservative management of dentigerous and radicular cyst in children with mixed dentition.
Clinical Indicators of Dental Caries and Periodontal Status
Children with Obesity
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Background: The aim of the present study was to evaluate the oral hygiene status and dental treatment requirements in children with obesity.

Methods: The present study was conducted on 60 obese children (38 girls and 22 boys) and 60 (33 girls and 27 boys) normal-weight controls, for this analysis, only children aged between 7 and 16 years were considered. The dental and physical examinations of the under standard light, using a plane buccal mirror, a dental probe and air drying to evaluate caries experience and to record the periodontal health of each child. Dental caries was assessed by trained and calibrated dentists using a visual-tactile method with standardized equipment. Statistical analysis was performed using chi-square test, Fisher exact test and ANOVA.

Results: The number of decayed and missing teeth were lower in the obese group when compared with control group (p > 0.05). The degree of abrasion and periodontal indexes were significantly different in obese group, compared to the control group (p < 0.05). The obese children were more likely to have plaque index and gingival index than control group. Investigated regarding salivary parameters, oral clinical parameters. Compared with controls, children with obesity had higher simulated salivary secretion rate (p > 0.05) and gingival inflammation were observed in children with obesity.

Treatment of an Abnormally Erupted Maxillary Central Incisor: A Case Report
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Introduction: The treatment of abnormally erupted maxillary permanent incisors, are challenging because of their importance to facial esthetics. These failures can be caused by crowding, arch space loss, trauma, presence of supernumerary teeth etc. Studies have shown that teeth which fail to erupt in their normal position need to be orthodontically aligned into their normal physiologic position. The treatment of an abnormally erupted tooth will depend on its state, position, and presence of enough space in the dental arch to accommodate.

Case: We report a case of a 12-year-old female with an abnormally erupted upper central incisor. Brackets were placed on the upper arch to eliminate the arch space loss. Then according to the treatment plan, forced eruption was needed. But, after the elimination of the arch space loss with nitinol coil spring, the tooth moved spontaneously into its proper position in the dental arch in 5 months.

Conclusion: At 1-year follow-up the right central incisor responded normally to percussion and mobility and sensitivity testing with normal width of attached gingiva.

Clinical Comparison between “Fiber Reinforced Composite-Loop” and “Band-Loop” Space Maintainers
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Introduction: The aim of this study was to evaluate the clinical performance of “Fiber Reinforced Composite (FRC)-Loop” and “Band-Loop” space maintainers.

Methods: Fifteen children (aged 4-7 years) volunteered for the study; all of them had premature loss of primary first molars or primary second molars in two quadrants. FRC-loop space maintainer was attached to the tooth using restorative composite resin in one quadrant and band-loop space maintainer was cemented with glass ionomer cement in the other quadrant. Patients were checked in 1, 3 and 6 months intervals for clinical success of two different type of space maintainers.

Conclusions: Though there was no statistically significant difference between two space maintainer types, the FRC-loop seems to be a clinically acceptable, useful and cheaper alternative to band loop space maintainer.
statistically significant difference between the amount of maxillary sinus expansion and the time intervals after extractions ($p < 0.001$). The largest sinus expansions detected in patients with extractions over 6 months ($p < 0.001$).

**Conclusions:** The results of this study revealed sinus pneumatization after maxillary first molar extraction. The amount of sinus expansion can be considered as negligible but the clinician should be aware of the increased probability for sinus pneumatization, possible exposure or perforation in cases of extraction of two or more adjacent posterior teeth.

**P698**

**Development of Permanent Maxillary Canines, Second Premolars and Molars in Early Mixed Dentition**

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**Aim:** It was aimed to compare of the developmental stages of the maxillary permanent canines, second premolars and second molars, for the orientation of the eruption guidance.

**Material and methods:** Panoramic radiographies of the 428 child patients who had applied our clinic and were between 8 and 10 years-old ($9.02 \pm 0.78$), had no systemic or developmental disorders, had accessible records and whose dental age was compatible with chronological age were examined. On the radiographies, developmental stages of maxillary canines, second premolars and molars were evaluated according to Demirjian's classification. For the statistical analyses, Mann–Whitney U-test and correlation analyses were used.

**Results:** Dental developmental stages of the girls were further in all age groups. This difference is statistically significant for the maxillary canines in all age groups and for the second premolars and molars in only 9-year-old patients ($p < 0.05$). A strong correlation was found between canines ($r = 0.47$), premolar ($r = 0.49$) and molars ($r = 0.36$) development and chronological age ($p < 0.01$). In the 8-year-old patients, while 38% of the canines had completed more than 1/3 of the root formation, <5% of the other teeth had showed the same evolution. For the further ages, maxillary canines’ developmental stages were advanced, either.

**Conclusions:** In all age groups, development levels of maxillary canines was observed further, in comparison with maxillary second premolars and second molars. Consequently, for the ideal occlusion, we can allow canines to erupt earlier than its normal eruption time so that Lee-way space can be protected.

**P699**

**Prader-Willi Syndrome: A Case Report**

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**Introduction:** Prader-Willi syndrome is a multisystemic neurodevelopmental genetic disorder caused by lack of expression of paternally inherited genes on chromosome 15q11-q13. The prevalence of Prader-Willi syndrome is estimated to be one in 10,000–25,000. It is characterized by severe infantile hypotonia with poor suck and failure to thrive; hypogonadism causing genital hypoplasia and pubertal insufficiency; characteristic facial features; early-childhood onset obesity and hyperphagia; developmental delay/mild intellectual disability; short stature; and a distinctive behavioral phenotype. Abnormal saliva secretion, emotional and behavioural problems, may affect the health status of the oral mucousa and teeth. A case, diagnosed clinically and radiographically as Prader-Willi Syndrome was evaluated.

**Case report:** A 7-year-old male patient diagnosed as Prader-Willi syndrome presented with neuromotor-development delay, mild mental retardation, speech defect, hyperphagia, hypogonadism and growth hormone deficiency. The physical examination revealed as strabismus, narrow bifrontal diameter with almond-shaped eyes, small nose down-turned corners of the mouth, small penis, obesity, small hands and feet. Oral findings are high pain threshold, low salivary flow, dry mouth, dental caries. Margins of gums are bleeding because of dry mouth and dry oral mucosa. The patient was well-adaptable and his caries are restored with amalgam, GIC and composite resins.

**Conclusion:** Prader-Willi syndrome is a multisystemic rare syndrome that affects the oral and systemic health and this manifestations should be exacted multidisciplinary treatment including both medical science and dentistry. It is very important to protect the maximum oral hygiene and to inform patient’s family.

**P700**

**The Problems Encountered During the Dental Treatments of a Patient with Congenital Ichthyosis**

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**Introduction:** The ichthyoses are a family of genetic disorder diseases characterized clinically by xerosis, scaling, keratosis pilaris and dry, thickened skin. It is a dermatological disorder which causes fish-like scales on the skin’s surface. Ichthyosis has many sub-varieties which may develop at birth (congenital ichthyosis) or after birth (vulgar ichthyosis). There has been 36 types of ichthyosis and 10 clinical entities according to a recent consensus conference. The patients with ichthyosis is tend to infections and they have bilateral lower and upper eyelid ectropion. The aim of this case report was to present a 8-year-old patient who had congenital ichthyosis.

**Case:** The main complaint of the patient was pain and she referred to our clinic. Extra oral examination showed that her skin was thickened, scaling and dry. Her lower eyelids were ectropic and she had been under observation of an ophthalmologist. We also observed angular cheilitis, cracks and ulserations on the corner of her mouth. Intra oral examination showed Molar- Incisor Hypomineralization. The oral mucosa was normal but there was limited mouth opening. The oral hygiene of the patient was not good.
enough so we planed restorative treatments and extractions for providing patient's optimal oral hygiene.

**Conclusion**: One of the points to take into account is to behave in a naturel way to these patients and not to make them feel that they are extraordinary. In this case, problems and therapeutic approaches of a child with ichthyosis during her dental treatments were presented.

**P701**

**Clinical Success Rate of Resin Based Fissure Sealants: One Year Follow-Up**

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**Aim**: The aim of this study was to evaluate clinical success rate of resin based fissure sealants terms of retention, marginal adaptation, caries recurrence and cracking.

**Methods**: Children with at least one pair of caries-free permanent first molars with deep pits and fissures were included in the study. The children who have a high risk for dental caries were selected. Resin based fissure sealant 3M™ ESPE™ Clinpro™ was applied to the 322 fissures of the first permanent molars in 100 children (by 3rd year undergraduate dental students). The ages of children ranged from 7–13. Twelve months after the application children were recalled for examination. Recall examinations were carried out by the same dentist. Retention, presence of caries, marginal discoloration, marginal adaptation and cracking were evaluated at 12th month by using Ryge's criteria.

**Results**: Among evaluated 322 teeth, retention: Alpha 95 (%29.5), Bravo: 143 (%44.4), Charlie 84 (%26); presence of caries: Alpha 274, Bravo 48 (%14.9); marginal discoloration: Alpha 322; marginal adaptation: Alpha 279, Bravo 43 (%13.3); cracking: Alpha 321, Bravo 1 (%0.3).

**Conclusion**: Dental sealants have been proved to be highly effective in the prevention of pit and fissure caries. The preventive effects of the sealant are maintained only as long as it remains completely intact and bonded in place. This study emphasized that after applying fissure sealants, patients must be recall and sealants must be check at least 6 month period to provide retention and marginal adaptation.

**Theme**: Dental Treatment & Restorative Dentistry: Periodontics

**P702**

**Gingival Recession Treatment: A Case Report**

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**Introduction**: Treatment of gingival recession for esthetics and root hypersensitivity by means of muco-gingival flap surgery is a very common approach in clinical practice. The aim of this surgical procedure was treatment of multiple recession defects by using a papilla rotating coronally advanced flap technique (PR-CAF).

**Case**: In this case, a female 51 years old with a multiple recessions on the teeth 13 (0.5 mm), 12 (0.5 mm), 11 (2 mm), 21 (1 mm), 22 (0.5 mm) and 23 (2 mm) has classified as “1” according to Miller’s recession index. The patient who had no interdental soft and hard tissue lost, presented a 1.5 mm keratinized gingival thickness. Marginal root abrasions due to excessive tooth brushing on the teeth of 11, 21, 22, 23 was treated by glass ionomer restorations. After completing the phase 1 therapy, PR-CAF surgery was performed in order to cover the multiple gingival recession.

Initial split thickness incisions on the newly designed papilla was followed by a full thickness elevation of the keratinized gingiva at the corono-apical direction. Releasing periostal incisions were made in order to reposition the flap coronally. The mucogingival flap was sutured on the tips of the de-epitelized papillas. Pre-existing crown restorations on the teeth 13, 12, 11, 21 were removed then new porcelain restorations was built on the related teeth after 2 months postoperatively.

**Conclusion**: The results of the present study demonstrated that PR-CAF was observed to be effective for the treatment of multiple Miller Type 1 recessions.

**P703**

**The Effects of Non-Surgical Periodontal Therapy on TAS, TOS and IL-6 Levels in GCF of Hyperlipidemic Smokers**

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**Aim**: The aim of this study is to investigate the effect of non-surgical periodontal therapy on clinical parameters, IL-6, TAS, TOS in serum, DOS and serum lipid parameters and to evaluate the effect of smoking on interaction between periodontal disease and hyperlipidemia.

**Materials and methods**: This study included 28 patients (14 female and 14 male), aged between 42–64 (mean 52.5 ± 10), with no-systematic disease without hyperlipidemia. Patients were divided into two groups; smoking (n = 14) and non-smoking (n = 14). At baseline, clinical parameters were recorded. GCF and blood samples were obtained from patients for IL-6, TAS, TOS and serum lipid parameters. Following baseline measurements and sampling, non-surgical periodontal treatment was performed to all participants. At clinical measurements and GCF, at 3rd month serum sampling were repeated. GCF and serum IL-6, TAS and TOS levels were determined by ELISA method and analyzed by using with “t-test” and “univariate variance analyze”.

**Results**: After non-surgical periodontal therapy all clinical parameters were significantly decreased. There were significantly differences between S(+) and S(−) groups at 1st and 3rd month (p < 0.05). GCF and serum IL-6 and TOS levels decreased, TAS level were increased after therapy in S(+) and S(−) groups. But there were significant differences between groups (p > 0.05). TC and LDL levels were decreased significantly but HDL level wasn’t increased significantly in S(+) and S(−) groups. There were no significant differences between S(+) and S(−) groups after non-surgical periodontal treatment on serum lipid parameters.

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Conclusion: Within the limits of this study; the effect of smoking on hyperlipidemic patients treated with non-surgical periodontal therapy may be limited without clinical parameters.

P704
The Retrograd Treatment of Persistent Periapical Lesion Using MTA and Allograft: 3 Years Follow-up
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Introduction: The aim of this case report is to present the treatment of an apical cyst due to previously untreated crown-fractured maxillary permanent incisors in an 11-year-old patient.
Case: The patient suffered from pain and swelling referred to our clinic. She reported an injury occurred 2 years ago. The clinical examination revealed an untreated crown fracture and discoloration on the upper right first incisor and a fistula on vestibular mucosa. The radiographical examination revealed a large lesion with open apex. Periapical surgery performed after 1-year a unsuccessful intercanal Ca(OH)2 treatment. Full-thickness flap was elevated and granulation tissue was removed. MTA was used as retrograd root canal filling material and an allograft together with collagen membrane was applied to the cyst cavity. Root canal was obturated with gutta perka and canal sealer 1 week after surgery. After 3-year follow-up the teeth was asymptomatic and the healing of apical area was perfect.
Conclusion: Regenerative periapical surgery without shortening the root length can be used successfully in young patients.

P705
The Recovering of Root Surface with Free Gingival Graft-One Case
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Introduction: Gingival recession may be defined as the migration of gingival margin to apical region. Gingival recessions which cause functional and aesthetic problems in patients take place among the important issues in periodontology. For this reason esthetic problems are solved during the attached gingiva is increased via closing denuded root surfaces with various mucogingival operations.
Case: A 23 years old woman patient applied to our clinic suffering from gingival recession and over sensibility. A type II gingival recession and insufficient ceratinised gingival band was diagnosed by the intraoral examination. Initial periodontal treatment was performed after oral hygiene motivation. After all an epithelial graft operation was performed to cover the denuded roots and enlarged the ceratinised gingival margin. The aim of this presentation is to reflect the patients mucogingival surgery results.

P706
Acute Necrotizing Ulcereative Gingivitis- Three Cases
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Introduction: Acute necrotizing ulcerative gingivitis (ANUG) is a microbial disease of gingiva in the context of an impaired host response. It is a rare, specific, infectious gingival disease that seen among young patients. Emotional stress, smoking, unsuitable oral hygiene, local trauma and especially HIV infection can be predisposing factors. It is characterized by the death and sloughing of gingival tissue and present with characteristic signs and symptoms.
Case: Of 18, 20 and 25 years old three male patient applied to the……Mouth and tooth health center with complains of halitosis, periododontal pain and gingival bleeding. Debridement was done to patients with hydrogen peroxide under local anaesthesia. At first visit, detartrage is done as possible. At the end of first visit patients were motivated for good oral hygiene. Patients called for everyday periodontal pain and gingival bleeding. Debridement was done to patients with hydrogen peroxide under local anaesthesia. At first visit, detartrage is done as possible. At the end of first visit patients were motivated for good oral hygiene. Patients called for everyday periodontal pain and gingival bleeding. Debridement was done to patients with hydrogen peroxide under local anaesthesia. At first visit, detartrage is done as possible. At the end of first visit patients were motivated for good oral hygiene. Patients called for everyday periodontal pain and gingival bleeding. Debridement was done to patients with hydrogen peroxide under local anaesthesia. At first visit, detartrage is done as possible. At the end of first visit patients were motivated for good oral hygiene. Patients called for everyday periodontal pain and gingival bleeding. Debridement was done to patients with hydrogen peroxide under local anaesthesia. At first visit, detartrage is done as possible. At the end of first visit patients were motivated for good oral hygiene. Patients called for everyday periodontal pain and gingival bleeding. Debridement was done to patients with hydrogen peroxide under local anaesthesia. At first visit, detartrage is done as possible. At the end of first visit patients were motiva

P707
Pemphigus Vulgaris- One Case
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Introduction: Pemphigus vulgaris diseases are a group of autoimmune bullous disorders that produce cutaneous and mucous membranes blisters. Pemphigus vulgaris is the most common of the pemphigus diseases which also include pemphigus foliaceous, pemphigus vegetans and pemphigus erythematosus. Most cases of pemphigus vulgaris are idiopathic. In approximately 60% of patients with pemphigus vulgaris, the oral lesions are the first sign of the disease and may herald the dermatologic involvement by a year or more. Virtually any region of the oral cavity can be involved, but multiple lesions of developing at sites of irritation or trauma. Oral lesions of pemphigus vulgaris are confined less often to the gingival tissues.
Case: A 55 years old male patient applied to clinics of periodontology at .... mouth and tooth health center with lesions in his mouth. Lesions were detected on palate, tongue and cheek by the clinical examination. Initial periodontal treatment was performed with motivation of good oral hygiene. After patient was referred to a dermatologist, pemphigus vulgaris diagnosed by biopsy inspection. First medication was high dose steroid Meanwhile the steroid dose decreased under dermatologist control. During the steroid treatment patient was periodontal controls were performed by constant intervals.

Conclusion: At the end of first year patient’s lesions were totally lost. Patient is at maintenance phase and routine controls are still performed.

P708
Microbiological Examinations in Treatment of Periodontal Disease
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Aim: The study aims to explore and highlight the microbial flora in different clinical forms of periodontal disease by Gram stained smear technique, available to the dentist.

Materials and methods: Pathological samples were collected under sterile conditions from patients examined clinically and Gram stained smears were performed, which allowed assessment of tincured morphological aspect, and of the flora relationship between G (+) and G (-). In parallel, the germs were cultivated aerobically and anaerobically from pathological samples, followed by smears made on culture, which allowed relationship orientation between the type of flora isolated and the clinical form of the disease.

Results: Research was conducted on 44 adults, urban and rural, 25 women (56.81%) (44 average age) and 19 men (43.19%) (50.4 average age). Of 136 isolated stems from 44 patients, a rate of 80.7% is anaerobic flora Gram (+) and (-). The study confirms approximately the same germs recorded in the literature for each clinical entity.

Conclusions: The study emphasizes the role of microbiological examination by Gram stained smear technique in predicting the disease status depending on the type of germs existent on the smear. Through successive smears one can appreciate the dynamic of the evolutionary process, which is really useful to the medical practitioner in developing a suitable treatment scheme for periodontal diseases, depending on the bacterial species peculiarities involved, with the view to optimize the medical care. This simple and accessible method aimed to monitor the effects of treatment subject to the characteristics of the bacterial species involved.

P709
Combined Periodontal and Orthodontic Treatment in a Patient with Papillon-Lefèvre-Syndrome
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Introduction: Papillon-Lefèvre syndrome (PLS) is an autosomal recessive disorder characterized by skin lesions, which includes palmar-plantar hyperkeratosis and hyperhidrosis with severe periodontal destruction involving both the primary and the permanent dentitions.

Case: A 6-year-old boy diagnosed with PLS presented with aggressive periodontal destruction of his primary permanent dentitions. Scaling and root planing were performed with simultaneous administration of oral 15 mg/kg amoxicillin and 10 mg/kg metronidazol three times daily and 0.12% chlorhexidine hydrochloride two times daily. Periodontally hopeless deciduous teeth were extracted. Protective and preventive orthodontic therapy was performed with a removable appliance. At the age 8 years, the permanent teeth have normal gingiva and crevice depths.

Conclusion: This 2-year follow-up case report suggests that an early diagnosis and the multidisciplinary treatments of PLS can lead to the stabilization of the periodontal health.

P710
Periodontal Approach in Treatment of Inflammatory Gingival Overgrowth: Case Report
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Introduction: Gingival enlargements are a common clinical finding and most represent a reactive hyperplasia as a direct result of plaque related inflammatory gingival disease. Chronic inflammatory gingival enlargement is caused by prolonged exposure to oral biofilm and factors which are favourable for the accumulation of oral biofilm. Proliferative overgrowth of the gingival tissue makes it more difficult for patients to maintain oral hygiene.

Case: This report describes the initial periodontal treatment and gingivoplasty operation for mandibular anterior region of inflammatory gingival overgrowth in a 18 years old patient who had gingivitis. The patient applied to Selcuk University Faculty of Dentistry Periodontology department because of gingival swelling, spontaneous bleeding, difficulty in chewing and and poor appearance. After intraoral and periodontal examination oral hygiene instructions were given. Scaling and root planning were performed for two sessions. One mouth after phase 1 initial periodontal therapy, the patients were reassessed. Only gingivoplasty operation was applied for aesthetic appearance. One year after periodontal treatment, healthy gingiva was seen and gingival enlargement was not observed.

Conclusion: In conclusion, in this report initial periodontal treatment resulted in significant improvement in clinical parameters,
Aim: The aim of this case report is to present the treatment process of a patient with soft and hard tissue defect due to traumatic extraction of left maxillary central incisor by performing hard tissue augmentation, implant placement and implant supported crown prosthesis.

Case Presentation: A 27 year old female patient was referred to the Istanbul University Faculty of Dentistry Department of Periodontology clinic for esthetic rehabilitation of her left maxillary central incisor. Medical and dental history of the patient revealed that the defect in the anterior maxilla was formed due to traumatic extraction. The vertical and horizontal ridge tissue augmentation was performed for obtaining an adequate anchorage of implant and better esthetic results. An adhesive provisional Maryland bridge was placed for esthetic reasons and soft tissue support. Nine months after augmentation surgery implant was placed. Six months after implantation prosthetic treatment was performed.

Conclusion: Defects following tooth extraction can cause physical and esthetic problems especially in the esthetic zone. These problems are more intense if the extraction is performed traumatically. In this case report, we have demonstrated a successful treatment of soft and hard tissue defect formed after traumatic extraction in the esthetic zone.

P713
Laser-Assisted Periodontal Plastic Surgery in Two Cicatricial Pemphigoid Patients: One Year Follow-Up
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Aim: Cicatricial Pemphigoid (CP) is a rare, blistering disease, characterized by severe, erosive lesions of the skin and mucous membranes. CP patients have difficulties while practicing oral hygiene because of the vesiculo-bullous lesions in oral cavity and these lesions reduce the quality of their life. This report presents diode laser application for deepening the vestibule sulcus in two CP patients who have inadequate attached gingiva and vestibular depth.

Method: Two white females (50 and 52 years old) were referred to the Department of Periodontology, Faculty of Dentistry, Selcuk University with complaint of ulcerated gingiva and pain. After histological and immunofluorescence staining of gingival biopsies, they were diagnosed as CP. The first phase of treatment included oral hygiene instructions, scaling and root planning and dietetic suggestions. Systemic corticosteroid was prescribed by dermatologist of the patients. After patients’ lesions were alleviated, vestibule sulcus deepening surgery performed in mandibular anterior and left maxillary posterior region using 940 nm diode laser with 5 Watt output power, 0.05 ms pulse length and 0.20 ms pulse interval (average power; 1 Watt) parameters.

Results: The surgical procedure was well tolerated by patients and no postoperative complication was noted. At the end of the 1 year after laser application, increased attached gingiva and vestibular sulcus depth were observed.

Conclusion: Oral care and regular dental visits are important for supportive periodontal treatment in CP patients. We suggest that diode laser application for vestibule sulcus deepening is safe and predictable treatment modality for cicatricial pemphigoid patients.
Morphohistological Evaluation of Modifications Generated by Conventional and Non-conventional Surgical Techniques in Periodontal Tissues
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Introduction: Non-conventional surgical techniques represent a highly used alternative by dentists due to their minimally invasive character. Laser assisted technologies are avant-garde techniques, used by many dentists, having many application in periodontology.

Aim of the study: To identify eventual morphohistological differences on microscopic samples obtained through classical chirurgical technique and through non-conventional (laser-assisted) one.

Materials and methods: Using the classical technique gingivectomies were made on a pig jaw, extracting 10 tissue samples of comparable sizes. Similarly, in the opposite quadrant gingivectomies were made using a diode laser with a wave-length of 940 nm, selecting again 10 tissue samples. The samples selected have been conserved in a fixing solution and histological samples were done which were later analyzed in a pathology laboratory.

Results and discussion: Tissue evaluation showed signs of evident differences between the conventional and non-conventional techniques. The laser assisted surgery procedures took less time than the conventional ones. Among the obvious clinical advantages of laser assisted interventions we can note less/diminished bleeding, absence of edemas, increased patient comfort (due to less pain generated by the operation) and fast healing (due to accentuated tissue regeneration).

Conclusions: We can state that laser-assisted technologies can be an extremely helpful aid in future periodontal therapies, recomended in case of periodontal surgeries due to their minimally invasive character, minor histological damage, easy to learn and fast technique.

Treatment of Denture Stomatitis: A Case Report
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Introduction: Denture-related stomatitis is an inflammatory process of the mucosa caused by a complete or partial removable dental appliance or usually typically a denture. “Denture stomatitis” is a mild chronic erythematous lesions, usually seen after middle age as erythema limited to the area beneath an upper denture, with the presence of the denture as the only common aetiologic factor to these situations (Newton’s Type II stage). This lesions may show different clinical patterns, and are more frequently found in the upper jaw, especially on the palate. Although denture stomatitis is usually asymptomatic, sometimes patients may complain of halitosis, bleeding, burning sensation and swelling in the involved area, xerostomia, or taste alterations. The aetiology is considered multifactorial, but denture, especially when worn during the night, represents the major causative factor. Among the aetiological factors that should be considered are prothetic factors, infectious factors, predisposing factors (Systemic and local factors).

Case: In this case report the diagnosis and treatment of denture stomatitis was presented a 38 years old man patient.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

Clinical Follow-up of Edentulous Patient with Stress-Induced Bruxism: Case Report
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Aim: Bruxism is a nonfunctional and usually subconscious action of grinding and clenching of the teeth. Emotional Stress usually accompanies bruxism. In this presentation 2 years follow-up of an edentulous patient suffering from chronic pain due to stress-induced bruxism is revealed.

Case: Sixty-six years old edentulous male patient applied to Istanbul University Faculty of Dentistry seeking for treatment of chronic myofascial pain. Intra-oral and extra-oral examinations were performed according to Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). Patient self reported bruxism was seen to be in correlation with increased emotional stress. Vertical dimension loss and moderate to high pain scores of palpation according to RDC/TMD was recorded. Subsequent to stabilization splint treatment and supportive treatment protocols, prosthetic rehabilitation is completed and patient was followed at 3 months intervals thereafter.

Conclusion: Treatment success requires long term follow-up and a long treatment period in patients with chronic bruxism. Multidisciplinary approach is essential for those patients suffering from stress-related bruxism and psychologists should get involved in the team in order to reach satisfying treatment results.

Delayed Eruption of Permanent Teeth with Maxillary and Mandibular Overdentures
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Introduction: This case report describes management of teeth eruption by using overdentures and definitive prosthetic rehabilitation by removable partial dentures with precision attachments for a young patient.

Case: A 16 years old adolescent presented at Istanbul University Dental Faculty for decayed teeth and pain. After the clinical and radiographic examination 4 unerupted teeth (17, 27, 37 and 47) and several decayed teeth were diagnosed. The treatment plan included teeth extraction, endodontic treatment and prosthetic rehabilitation. By the time extractions and restorative treatments
were completed, root supported maxillary and mandibular overdentures were fabricated for erupting of second molars for both jaws. The case was followed up for a period of 2 years every month. During the follow-up appointments the prosthesis were modified as the adolescent grew and as the permanent teeth erupted into the oral cavity. The dentures were trimmed from the areas of erupting teeth to facilitate their eruption. After the period of 2 years, eruption of teeth was completed. Removable partial dentures with precision attachments were made for permanent maxillary and mandibular prosthesis.

P718
Clinical Outcome of Zirconia-Based Fixed Restorations
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Aim: The aim of this study was to evaluate the clinical outcome of zirconia based fixed restorations (Lava CAD/CAM system, 3M ESPE, Germany) after 5 years, between 2008 and March 2013.

Materials and methods: A total of 18 patients, 16 women and two men, age 52 and 40.5 respectively, were treated with zirconia based fixed partial dentures during 5 years period. A total of 111 abutment teeth (63 single crown (37 maxillary anterior, 14 maxillary posterior and 12 mandibular posterior) and 17 fixed partial dentures (6 three units, 6 four units, 1 five units, 2 six units and 1 seven units) with 48 abutment teeth (18 anterior and 30 posterior) were restored. Seventy restorations were luted with Rel-X Unicem self-adhesive resin cement and forty-one’s with glass ionomer cement. All the patients were called for control examination but, five of them did not respond. The mean restoration time were 38.55 months (range 13 to 60 months). The rate of success was assessed by clinical and radiographical examination.

Results: No framework fracture was observed among 92 restorations. Four failures were occurred: two veneer porcelain chipping at 3th months in service, one debonding at 29h months and one lost restoration at 13th months due to severe local periodontal problem of abutment tooth. No secondary caries, but few local periodontal inflammation were observed. Both of luting cements were found clinically successful.

Conclusion: Zirconia based fixed restorations exhibits satisfactory clinical outcome for a mean 38.55 months of follow-up period.

P719
Fracture Strength of Zirconium Resin Bonded Fixed Partial Dentures
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Aim: Evaluation the influence of luting agents on the fracture strength of zirconium resin-bonded fixed partial dentures (ZRBFPDs).

Materials and methods: Forty human right and left mandibular lateral incisors were embedded in acrylic resin as located on the mandibular dental arch. Supragingival chamfer finish line 0.5 mm and proximal chamfer finish line 1 mm in dept, ending 1 mm above the cemento-enamel junction were prepared to the lingual surfaces of abutment teeth. The impression of each cast was made with a silicon impression material. Twenty zirconium substructures (Lava 3M ESPE, Germany) were fabricated to replace missing two mandibular central incisors. The intaglio surface of the ZRBFPD was air borne particle abraded with 110-mm aluminum oxide particles. Ten specimens were cemented with Automix and the other ten with Clearfill resin cement (n:10). Prior to the testing all bonded specimens were stored in distilled water at 37°C for 24 h. The specimens were subjected to fracture strength tests in a universal testing machine. The debonding and fracture loads were measured. Results were analyzed statistically with Spearman’s rho correlation test and the data obtained was evaluated by Mann Whitney U test. The level of statistical significance was set at p < .05.

Results: Any statistical difference was found between debonding and fracture loads for the tested resin cements (p = 0.880 and p = 0.880 respectively). Mean debonding and fracture loads for Automix and Clearfill were 682.60, 873.20 and 643.50, 985.30 N respectively.

Conclusion: Zirconium resin-bonded fixed partial dentures could be cemented safely with Automix and Clearfill resin cement.

P720
Fracture Strength of Fiber – Reinforced Composite Fixed Partial Denture with Empress II Pontic
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Aim: In vitro evaluation of the shear bond strength of fiber-reinforced composite fixed partial denture with Empress II pontic constructed with polyethylene and glass fiber.

Materials and methods: Forty human left maxillary central and right lateral incisors were embedded in acrylic resin as located on the maxillary dental arch. Palatal groove, 2 mm in depth and 1 mm length, was prepared to the palatinal surface of the abutments. An impression of each cast was made with a silicon impression material. Twenty right central Empress II (IPS Empress System, Ivoclar, Vivadent) pontics were fabricated with a same palatinal groove. The pontics were placed between central and lateral incisors. The polyethylene fiber ribbons (Construct; Kerr, Orange, California), and glass fibers (EverStick (StickTech, Turku, Finland)) were placed along the grooves of the Empress II crown’s (n:10). Teeth-pontic
and fiber combination were luted with resin cement (Ivoclar, Vivadent). Prior the shear bond test all bonded specimens were stored in distilled water at 37°C for 24 h. The teeth were subjected to a compressive load in a universal test machine. Results were analyzed statistically with Spearman’s rho correlation test and the data obtained was evaluated by Mann Whitney U test. The level of statistical significance was set at \( p < 0.05 \).

**Results:** Statistically significant difference was observed for glass fiber (\( p = 0.041 \)). The mean fracture loads were 392.5 and 650 N for polyethylene fiber and glass fiber respectively.

**Conclusion:** Glass fiber was more resistance than the polyethylene fiber when used in fiber reinforced composite fixed partial denture.

**P721**

**Oral Rehabilitation of Patient with Anadontia**
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**Introduction:** Congenitally malformations or genetic defects can result in both soft and hard tissue loss and effect young patients' functional and social confidence. Patients with anadontia or oligodontia often need complex multidisciplinary treatment. The goal of the treatment must include improving aesthetic appearance, speech and masticatory function. The options for a definitive rehabilitation plan may be fixed, removable or implant supported prosthesis. However some constrains can prevent the choosing most desirable reconstruction.

**Case:** This clinical report describes the treatment provided to a young patient who presented with anadontia at both maxilla and mandible anterior segment and hard tissue defect at premaxilla. Before prosthetic rehabilitation, maxillary anterior alveolar crest was reconstructed. The reconstruction of the alveolar ridge was applied by augmentation of particulate bone which were collected from the anterior torus of the maxilla and the surgical reconstruction completed by destruction of anterior segment of this jaw. After surgical procedure, prosthetic rehabilitation was completed with tooth supported removable partial prosthesis with custom made bar. By applying prosthetic rehabilitation the chewing functions and physical appearance were reformed. During 8 year clinical follow up period no complication has been occurred. The patient’s functional and social confidence improved significantly.

**P722**

**Prosthetic Treatment of Non-Syndromic Oligodontia: A Case Report**
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**Introduction:** Oligodontia is the agenesis of six or more teeth, excluding third molars. Genetic factors play an important role in oligodontia which can occur as an isolated finding or as part of a syndrome. Characteristic dental symptoms are a reduced number of teeth, a reduction in tooth size, anomalies of tooth form and delayed eruption. The absence of teeth in patients can cause aesthetic, functional and psychological problems, particularly if the anterior region is involved.

**Case:** This case report describes the prosthetic treatment approach toward a patient 19 years of age with non-syndromic oligodontia, with absence of 10 permanent teeth. Genetic counseling revealed non-syndromic autosomal-recessive-linked oligodontia. The objectives of the treatment was prosthetic restoration of the missing teeth and provision of occlusion with full-mouth zirconia restorations after increasing occlusal vertical dimension by 2 mm.

**P723**

**Color Stability of Condensable Composites Polymerized with Halogen Light Unit**
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**Aim:** Color changes may be observed in composite restorations because of several physical factors in oral cavity for example water or drinks, and aim of this study was to examine the color stability of condensable composite samples immersed in deionised water after polymerizing with a conventional halogen light unit.

**Materials and methods:** In the study, a posterior condensable composite resin (Solitaire-2, Heraeus-Kulzer/Germany) was used. Color of composite was selected as “A2” owing to its high light permeability. Composite material were placed in teflon molds (sizes: 7 mm diameter \( \times \) 1 mm high) and surfaces were flattened with a glass plate. Light power intensity of a conventional halogen light unit was controlled with a radiometer device (Hilux, Benlioglu/Turkey) before polymerization of samples. Then, samples were polymerized for 40 s with light unit (Hilux 200, Benlioglu/ Turkey) (light power: 450 mW/cm²) according to the manufacturer’s recommendations. Color changes of samples were measured with a colorimeter device (Colorimeter CR-321, Minolta/Japan) according to “CIE-L*a*b* color system”. Measurements were performed at three different times during storing of samples in deionised water as; “1-initial time, 2-after 1 week, 3-after 1 month”. Data were determined with Duncan Comparison Test (\( p < 0.05 \)).

**Conclusion:** Statistically more color changes were observed at the group of “after 1 month” than the other groups (\( p < 0.05 \)). It was reached the conclusion that, the color changes in composites are possible depending on time as a result of exposure to water or other liquids in oral cavity. However, this opinion should be supported by new other studies.

**P724**

**Repeatability in Instrumental Shade-Matching**
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**Aim:** Repeatability of shade matching is the ability to reproduce a shade under defined conditions. Shade matching is often regarded as the most sensitive procedure in prosthetics. The aim of the study was to evaluate the short-term reproducibility of shade selection techniques. The results of this study are expected to provide guidelines for shade selection and to have positive effects on the success of restorative procedures.

**Materials and methods:** Three shade selection techniques were compared in this study. The first technique was the visual comparison with an artificial tooth. The second technique was the use of a shade guide. The third technique was the use of a colorimeter device. The shade of artificial tooth was measured with a spectrophotometer device (Colorimeter CR-321, Minolta/Japan) according to “CIE-L*a*b* color system”. Measurements were performed three times in the same day and the differences were calculated. The differences were evaluated with one-way ANOVA test.

**Results:** The visual comparison with an artificial tooth had the highest mean difference (3.06) followed by the use of a shade guide (2.54) and the use of a colorimeter device (2.14). The use of a colorimeter device had the lowest mean difference among the three techniques.

**Conclusion:** The colorimeter device was found to be the most feasible technique for shade selection in prosthetics.

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Objective: The aim of this study was to evaluate the results of dentists’ shade-matching procedure which is utilized by a dental spectrophotometer, in terms of repeatability.

Materials and methods: This study was conducted with 54 volunteer dentists at Suleyman Demirel University Faculty of Dentistry. The study was approved by the Suleyman Demirel University Ethical Committee. Each volunteer provided written informed consent. The study was performed in a dental clinic specially prepared for this procedure, with a stabilized dental unit, and standardized environmental illumination. Shade-matching procedure was conducted on one of the volunteers’ maxillary left central incisor. A dental spectrophotometer (Vita-EasyShade, Vita – Germany) was used for the shade-matching procedure. The participants were asked to match the shade of the designated tooth by using the dental spectrophotometer for two consequent days. Buccal 1/3 middle portion of the tooth was defined as target area. To eliminate individual failures of the dentists, a maxillary essix template with a hole coinciding to the buccal 1/3 middle portion of the tooth was prepared. Participant dentists were asked to repeat the same instrumental shade-matching procedure with the template “on”.

Matching the same shade in consequent measurements was defined as a “success” and recorded as “1”, while any inconsistency was defined as a “failure” and recorded as “0”. The chi-square test was used for statistical analyses (p < 0.05).

Results: Repeatability scores of the shade-matching procedures by dentists' shade-matching procedure which is utilized by a dental spectrophotometer for two consequent days. There were no significant differences among the three noble alloys and to compare with laser-sintered Co-Cr alloy using methodology in ANSI/ADA Specification No. 38.

Material and methods: Dental porcelain was applied on two cast (Co-Cr, palladium-silver) and one laser-sintered (Co-Cr) base metal alloy.12 specimens were prepared for each group for bond strength comparison. Alloys were cast into metal strips (25 × 3 × 0.5 mm), using torch melting. Vita VM 13 porcelain with overall dimensions of 8 × 3 × 1.1 mm was centrally applied on each strip. The specimens in the first casting group used 100% fresh alloy and served as control. Metal ceramic specimens were also prepared after each alloy was melted a second and third time. No new metal was added for the second and third casting. Results from 3-point-flexure test compared. Statistical comparisons were made using the Kruskal-Wallis test.

Results: There were no significant differences among the three alloys after the first casting. The flexure strength was not significantly different (p > 0.05) from that for the cast Co-Cr metal–ceramic specimens and the laser-sintered Co-Cr metal–ceramic specimens.

Conclusions: All three alloys had adequate porcelain bond strength. The new laser-sintering technique for Co-Cr alloy appears promising for dental applications, but additional studies are needed before its acceptance into dental laboratory practice.
fixed into the vestibular surface by screws. The surrounding area of the block graft was filled with allograft and covered with collagen membrane. The sutures were taken out after the 10th day and controlled monthly for the following 6 months. After the radiographic examination, two implants were placed on alveolar partial edentulous area. By means of using provisional restoration, papilla formation was completed. Also hyaluronic acid was injected related area for papilla formation. After using temporary acrylic restoration, metal supported porcelain restoration has been finished as a final restoration.

**Conclusion:** By this approach of therapy, the retention complaint of the patient was diminished.

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**P728**

**Laser Sintered Non-Precious Double Crowns Supported Overdenture- A Case Report**

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**Introduction:** The clinical use of removable partial denture is influenced by the concept of connecting remaining teeth and removable prostheses. An appropriate retainer for successful restoration is selected after considering the number and alignment of natural teeth, the periodontal condition of remaining teeth, and patient’s esthetic demands and financial limitations. Double crowns have proved to be an effective means of retaining removable partial dentures. The double crown system retains dentures more effectively than conventional clasp-retained removable partial dentures and also shows more favorable transmission of occlusal loading to the axis of abutment teeth. The indication for double crowns is a partially dentate arch with existing of few remaining teeth.

**Case Report:** A 57-year-old female patient presented to Istanbul University, School of Dentistry, Department of Prosthodontics, with functional and aesthetic concerns. The periodontal conditions of the remaining teeth revealed moderate scores. Three anterior teeth (11,12,21) are restored with double crown laser sintered cobalt-chromium alloy crowns and double crowns retained with a removable complete denture. Opposite arch restorated with a laser sintered crown. A composite resin restoration with screw post and a one-piece dowel crown.

**Conclusion:** Non–precious double crowns can be a treatment choice when used with accurate methods such as laser sintered because of their well adaptation and less price. Patient satisfaction, sufficient retention and stabilization are obtained with this method. Double crown-retained removable dental prostheses on teeth seem to be a promising treatment option for patients with a strongly reduced dentition.

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**P729**

**Primary Failure of Fixed Metal-Prostheses among Albanian Population**

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**Aim:** The aim of this study was to investigate primary failure during the preprosthetic and prosthetic treatment and shortly after the treatment, i.e. till 30 months afterwards.

**Materials and methods:** Primary failures related to fixed metal ceramic bridge prostheses made by Albanian dentists. Out of 60 patients treated during 2009–2013 randomized (31 woman and 29 men). Mean age was 40 years (range 26–65 years). Altogether was 65 fixed bridges. Single crowns were not included in our study. Data concerning preprosthetic treatment, the preparation phase and 3 years after follow-up examination after the completion of the treatment were collected from the patient files.

**Results:** During preprosthetic endodontic treatment of the fixed bridges in 2009–2013, in preparation of the abutment teeth there were nine pulp perforation of which therapy was successful in two cases, but in six cases of these endodontic treatment was carried out. Marginal fidelity was unsatisfactory in 13% of the bridges and gingival bleeding and pockets of 4–6 mm were noted in 27% and 12 cases, respectively. Two percent of the subjects had caries in the abutments, result of marginal leakage, notice minimum 1 year lead to dissolved sealant of the pontics.

**Conclusion:** During the treatment phase the most usual primary complications and failures related to fixed bridges occur during preprosthetic endodontic treatment of abutment teeth. The previous restoration of the prepared tooth did not have any marked effect on the prognosis of fixed metal-ceramic bridges, comparing a composite resin restoration with screw post and a one-piece dowel crown.

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**P730**

**Analysis of Traumatic Ulcerations Following Delivery of Complete Dentures**

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**Aim:** The frequency and location of traumatic ulcerations following delivery of complete dentures (CD) was evaluated in this study.

**Materials and methods:** Twenty-four female (mean age: 57.12 ± 11.37 years) and 26 male (59.38 ± 11.17 years) patients receiving CD were evaluated for traumatic ulcerations on the next day. The location, mucosal depth (epidermal or dermal), the reasons and the mucosal soreness severity index (MSSI) of the ulcerations were recorded. Data were statistically analyzed by using Kruskal-Wallis and Chi-square tests (p ≤ 0.05).

**Results:** The majority of the traumatic ulcerations were observed in the mandible compared to maxillae. The most frequent location for the mandible was the lingual sulcus (28.8%) (X² = 46.712, p = 0.0001) and the tubers for maxillae (42.1%) (X² = 9.158, p = 0.05), respectively. The most frequent reasons for were the over-extended mandibular denture borders (52.1%) (X² = 255.973, p = 0.000) and the maxillary undercut areas (42.1%) (X² = 6.895, p > 0.05). The majority of the lesions were epidermal (68.5%) and Type 4 according to the MSSI (55.6%).

**Conclusion:** The findings of this clinical study indicate that denture borders and undercut areas of CD should be carefully checked and
adjusted at the denture delivery appointment. Particular attention should be given to the mandibular denture border molding during impression taking as well as fabrication.

P731
The Effect of Different Mucosa Thickness on Stress Distribution of Two Different Implant-Supported Overdenture Designs under Bilaterally Loading
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Objective: The aim of this study was to evaluate the effect of different mucosa thickness on the stress distribution of two implant-retained mandibular overdenture designs under bilaterally loading using photoelastic stress analysis method.

Materials and methods: Six photoelastic models of an edentulous mandibular were fabricated with solitary two implants (4.0 x 11 mm) which were placed in the canine regions. The attachment systems studied were ball and locator stud attachments. Both ball and locator attachment groups that mucosa assumed three characteristics of thickness (1 mm-1 mm, 1 mm-2 mm, 1 mm-4 mm). In all models, implants were placed parallel to each other and to the midline. Static vertical force of 135 N was applied bilaterally to the central fossa of the first molars. Models were positioned in the field of circular polariscope to observe the distribution of isochromatic fringes around the implants and interimplant areas under loading. The stress fringes were monitored and recorded photographically.

Results: Ball attachment groups produced higher stress values than locator groups in all test models. Both attachment designs produced the lowest stress values in stimulated 1 mm-1 mm mucosa thickness model. Ball attachment caused the highest stress in stimulated 1 mm-4 mm mucosa thickness model. Locator groups showed the most equitable stress distribution in all groups.

Conclusion: In this situation, presence of different mucosa thickness between the implants choice of locator attachment may provide uniform stress distribution.

P732
Polyethylene Fiber-Reinforced Resin Bonded Bridges Prepared with Two Different Methods: Four Case Reports
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For missing anterior permanent tooth, different prosthetic treatment options can be considered including resin-bonded bridge with a metal substructure, conventional 3-unit fixed partial denture, removable partial denture or implant supported single crown. Direct and indirect fiber reinforced resin bonded fixed partial dentures are minimally invasive, esthetic and economic metal free tooth replacement. Other advantages include saving of time, elimination of second visit, ease of application, absence of metal allergy, ease of cleaning, naturalness of feel and allowing to repair.

Providing restoration almost without tooth preparation is the most important advantage of these restorations.

These four case reports describe clinical cases which fiber reinforced resin bonded bridges were fabricated according to the direct or indirect technique for replacement of missing tooth. Patients with one missing tooth at the anterior region were treated with direct fiber-reinforced fixed partial dentures in the anterior region.

In two cases, a polyethylene fiber reinforced resin-bonded bridge was fabricated according to the direct technique for the replacement of missing tooth. In other two cases, all composite resin pontic was prepared extraorally according to patient’s impressions. Than, fiber-reinforced resin bonded bridge prepared using polyethylene fiber material.

The advantages and proactively allowing to rehabilitation of other prosthesis options used indicates that these types of restorations may be a viable treatment option.

P733
Treatment of Mandibular Resection Patient with Implant Retained Hybrid Prosthesis
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Introduction: Segmental resection of the mandible may compromise orofacial function and often lead to patients psychological disorders. Facial asymmetry and esthetic deformity are frequent consequences of such process, which may also include deviation and intrusion of the mandible, motor and sensory disorders, abnormal intermaxillary relations and malocclusion. The aim of this case report was to present the prosthetic rehabilitation of mandibula which has bone and soft tissue loss after mandibular resection and immediate reconstruction plate fixation with implant supported hybrid denture and maxilla with precision attachment partial denture.

Case: A 48 years old woman exhibits mandibular defects due to the process of mandibular resection and immediately reconstruction plate fixation. Patient also presents facial asymmetry and esthetic deformity with deviation and intrusion of mandible, abnormal intermaxillary relation. Treatment plan is to placed four dental implants in anterior mandible and to establish implant retained fixed hybrid denture in mandible and precision attachment partial denture in maxilla. In 6 months follow up period no problem has occurred associated with dental implants and prosthesis.

Conclusion: Dental hybrid dentures are relevant treatment option for ensure the maintenance of reconstruction plate fixation and mandibular defect area. This case shows that maxillary precision attachment denture and mandibulary implant-supported dental hybrid prosthesis rehabilitation positively influence oral functions. The final result indicates an improvement of the local anatomy, with functional and esthetic optimization owing to the dental hybrid prosthesis in patients exhibited mandible defect.
P734
Correcting Thick and High Attached Labial Frenulum Using Diode Laser
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Introduction: A high maxillary labial frenulum attachment can be a major causative factor for denture midline fractures and/or decrease in retention. To overcome these problems, the frenulum should be modified or removed surgically. The use of lasers for frenectomy has been proposed as having many advantages such as hemostasis, minimal postoperative pain, no suturing and faster healing response. The aim of this case report was to examine the effectiveness of diode laser in frenectomy and evaluate the outcome of the surgical and prosthetic treatments.

Case: Under local anesthesia an 810 nm diode laser with a 400 micron fiber was used in contact mode at a 3.5 W output power with continuous and controlled movement to remove maxillary labial frenulum. Neither carbonization nor any bleeding at the operation site was observed. No suturing and analgesic was required for the patient.

The control examinations at 1–7 days, and 3 weeks postoperatively showed that the healing process was running a normal course and was uneventful, painless and without scarring, edemas and any other signs of infection in the tissues; whereas other alternative procedures have to be accompanied by administration of antibiotics and analgesics to minimize postoperative infection and pain. Starting after 3 weeks of the frenectomy, prosthetic rehabilitation was finished within 2 weeks. The follow-up after 6 months confirmed that the frenectomy and prosthetic rehabilitation were totally successful.

Conclusion: Laser therapy for soft tissue correction would conclude with more successful results and higher patient satisfactions compared with conventional surgical procedures especially for patients with systemic diseases.

P735
Evaluating Mechanical Properties of A New Modified Polyurethane Elastomer In Maxillofacial Prosthesis
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Aim: Lining the facial prosthesis with polyurethane liner (P) is recommended by the authors. However it is very difficult to have strong adhesion between polyurethane and maxillofacial silicone elastomer. For this reason modified polyurethane elastomers (MP) were manufactured. By using MP adhesion with silicone elastomer became acceptable. The aim of this study is to test and compare the mechanical properties of MP.

Material and methods: A total of 60 test specimens were prepared from P and MP for tear and tensile test. Fifteen test specimens were prepared for tensile test as a dumbbell-shaped and tear test for as a “pants leg” shaped for each materials. Test specimens subjected to tensile and tear test with a universal testing machine with a cross-head speed of 500 and 55 mm/min respectively. Tear strength, tensile strength, elongation percentage were calculated automatically by the software. The data were analyzed using T-test, (p < 0.05).

Results: There were no statistically significant differences (p < 0.05) for tensile strength (p = 13.79 ± 2.94 N/mm, MP = 14.9 ± 4.65 N/mm), tear strength (p = 4.85 ± 0.35 N/mm, MP = 4.52 ± 0.69 N/mm) for each materials. There were statistically significant differences for percent elongation (%E) and percentage of plastic deformation among the materials. Percent elongation (%E) of MP (258.6 ± 68) were higher than P (179 ± 33.1). Percentage of plastic deformation of MP (0.93 ± 0.27) were lower than P (21.21 ± 5.9).

Conclusions: Within the limitations of this study it can be concluded that mechanical properties of MP better than P. MP can be used as a liner in maxillofacial prosthesis.

P737
Facial Shield Used for Prevention during Sports: Case Report
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Introduction: Dental injuries, followed by facial fractures, are the most common orofacial injury sustained during participation in sporting events. The fabrication of mouth guards, helmets and face mask or facial shields are very important to decrease the number and
severity of dental injuries. This case report describes the fabrication of facial shield that is used for protecting nose during sport activities. Case: Two patients, who have nose surgery 2 months ago, applied to our clinic to protect their noses from sports trauma. Because of the nose surgery, this area must be protected against all impact during sports. The procedure requires a facial moulage, facial model, custom facial shield made of polymethylmethacrylate fitted with soft lining material and binding the facial shield with the orthodontic elastomeric strips. This simple procedure is applicable for athletes who participate in many contact sports. The shield was tried on the patient to ensure proper coverage of the desired facial areas. The patients were followed up after their basketball match without any complaints. Conclusion: Dentists play the key role in the prevention and treatment of sports-related dental and orofacial injuries, and can optimize fit and comfort rehabilitation with the custom-made protector. Dental, oral, facial and cranial injuries can be reduced by the use mouthguards and faceguards.

P738
The Custom Abutment of a Maxillary Premolar Metal Fused Porcelain Restoration
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Case: In this case report the 41 year-old female patient with an osteointegrated implant on left first maxillary premolar came to our clinic, 4 months after surgery. The implant was inserted nearly angled to 45°. The angled abutments produced by the implant firm were only angled to 25°. We obliged to do “custom abutment”. The impression was taken by an impression post with polyether impression material (Impregum Penta H Duosoft Polieter). The 25° angled abutment was prepared and a retention groove was made to the palatinal surface of the abutment. Then a wax sample was prepared and a custom abutment was cast from Crom-Nikel material angled to 45°. The metal fused porcelain crown was prepared. The final restoration was cemented conventionally.

P739
Antibacterial Activity of Dental Luting Agents: Direct Contact Test
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Aim: Luting cements used in dentistry for cementation of different materials and their physical, chemical and antibacterial properties are very important. The aim of this in vitro study was to evaluate different manufacturers’ resin, phosphate, polycarboxylate and glass ionomer cements antibacterial activity using Direct Contact Test (DCT).

Materials and methods: Direct contact test method, Streptococcus mutans, Streptococcus salivarius, Candida albicans micro-organisms prepared for the four different cements. The materials were tested immediately after application to the microtiter wells (fresh samples) and after setting for 3 days (set samples), a total of 24 groups. Luting cements 96- well cell culture dish to be 2 mm in height. Cement samples prepared with a solution of 1 h direct contact with bacteria is provided. Using a spectrophotometer at intervals of 1 h, 24 h for the solution of bacteria was measured 530 nm optical density.

Results: In all groups fresh samples DCT results are better than old samples DCT results.

Conclusion: Phosphate cements were found more potent bacterial growth inhibitors when their fresh with DCT.

P740
Rehabilitation of Patient with Cleft Lip and Palate: Case Report
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Introduction: Cleft lip and palate is congenital deformity cause by abnormal nasal development during gestation. In most of the patients with cleft lip and palate have narrow maxilla. The aim of this treatment was to enlarge maxillary bone with RME apparatus, subsequent to orthodontic treatment; laminate veneer restorations performed to closure of diastema and satisfy patient’s aesthetic expectations.

Case: Twenty-one-year-old female patient came to our clinic with complaint of aesthetic, functional and nutritional problems by reason of oro-nasal communication. Detailed medical anamnesis were obtained the patient had cleft lip and palate surgery when she was 3-year-old. In extraoral examination, the patient had scared lip. In intraoral examination, unilateral cleft palate, bilateral cross bite related to maxillary transversal deficiency and rotatory-complicated teeth in maxillary anterior region were seen. In temporomandibular joint examination, the patient hadn’t any complaint or pain. Her mouth openness and muscles were normal.

Conclusion: And with our treatment, the patient’s aesthetic, functional and nutritional problems were solved.
mine the average values for root length (using test $t$ Student, ANOVA). Those determinations were made on 140 extracted permanent teeth. Using simple regression from the tests General Linear Models (program Statistic 6.0) we identified a linear function, $y = b_0 + b_1x$, upon which we established a correlation between periodontal effective surface variation ($y$) and intraalveolar bone root length ($x$), for each tooth with periodontal disease. Let $b_0$ and $b_1$ be intercept and slope, respectively.

**Results:** Simulating the same level of periodontal attachment (e.g. 7 mm) has shown that, in case of monoradicular teeth, the periodontal (desmodontal) functional surface resulted was greater as tooth root increased (e.g. 38.19% for the upper central incisor vs. 50.54% for maxillary canine). In case of multiradicular teeth, the desmodontal functional areas were almost equal (e.g. 45.84% on upper M1 vs. 44.36% on mandibular M1).

**Conclusions:** The longer the root, the better the implantation (i.e. the larger periodontal support for a fixed prosthesis). Also, by comparison, pluriradicular teeth have a more pronounced decrease of desmodontal area, for the same periodontal recession.

**P742**

**Inlay Retained Dental Bridges with Using CAD-CAM Technology**

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**Introduction:** In recent decades, patient requests for aesthetics and biosafety has been increased the desire for inlay-retained fixed partial dentures (FPDs), to minimize loss of dental hard tissue, in addition new fabrication systems combined with a computer-assisted fabrication systems (CADCAM) are becoming very popular and suitable. The aim of this study is providing one chair time treatment to the patient and making minimal preparation on tooth structures. Design and fabrication of the ceramic inlays are performed using machine set at the chairside in the dental treatments. There are advantages to using CAD-CAM: new materials are safe, aesthetically pleasing and durable; increased efficiency in laboratory processing; quick fabrication of the restoration; and quality control of restorations such as fit, mechanical durability and predictability.

**Case:** In this study only one tooth was missing and abutment teeth had composite restorations. Patient had good hygiene and no signs of periodontal diseases. Filling materials are taken out and inlay cavities are prepared without removing vital dental hard tissue.

All restorations were constructed as three-unit end-to-end FPDs. Cerec Sirona Blocks “40 size” were used. After milling block 3 units FPB was made. By using panavıa resin cement restoration was cemented at same day. Resin cement provides bonding strength of restoration to the tooth surfaces.

**Conclusion:** At the end of this study it can be told; by using CAD-CAM devices it is easy to create best fitting marjins and aesthetic restorations at one chair time more over inlay retained bridges provides minimally prepared design and keeps tooth vital structures.

**P743**

**Assessment of Hygiene Habits and Attitudes among Removable Denture Wearers**

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**Purpose:** To determine denture cleaning habits and attitudes of removable partial denture wearers as well as conducting the social status of the studied population sample.

**Methods:** A total of 150 removable partial denture wearers, who sought treatment at İstanbul Medipol University, School of Dentistry were involved in this study. Ethical approval was sought and granted. All patients were interviewed using a structured questionnaire, related to age, sex, educational status, general health, overnight denture wearing, cleaning tools, materials, frequency and ever being informed about removable denture hygiene maintenance. Possible statistical relationships among some of questioned items were analysed by descriptive statistics.

**Results:** Majority of the patients had poor educational level and reported that they had not been informed about the denture hygiene methods by their dentists. Brushing either with or without toothpaste was the most frequent method used to clean dentures where soaking in denture cleansers revealed as a less preferred method. More than half of the patients reported that they brush their remaining teeth once a day and get informed about dental health by dentists and by media.

**Conclusion:** Most of the patients in this study did not clean their dentures properly and should be thoroughly informed and instructed, concerning denture hygiene methods and denture removal overnight.

**P744**

**Oral Rehabilitation of A Patient with Broken Dolder-Bar and Unretentive Prosthesis in The Edentulous Mandibula: A Clinical Report**

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**Introduction:** Implant supported removable prosthesis have been used over 30 years. For renewing the old prosthesis it’s important to know implants brand names.

**Case:** This clinical report describes the rehabilitation of a 80 years old patient with two implants at canine region and a broken dolder-bar in mandibula. She doesn’t know implants brand names and in this situation patient’s gingenva covered the implant surfaces which is then treated periodontically and broken dolder-bar and prosthesis renewed with hader bar and without using implant level impression.
Bacterial Adhesion of *Staphylococcus epidermidis* on Polyamide and Polymethylmethacrylate Denture Base Resins

Hatice Agan, Gülay Kansu, Semih Ożkan

Objective: The aim of this study was to examine the adhesion of *Staphylococcus epidermidis* on different types of denture base materials before and after thermocycling process. Nylon was introduced in 1950’s as a flexible denture base material, proving to be entirely unsatisfactory owing to its poor ability to resist oral conditions. Modified polyamide denture base materials have become available with improved physical and chemical aspects. *Staphylococcus epidermidis* is an important pathogen in immunocompromised patients.

Materials and methods: In order to produce comparable smooth surface, fourteen specimens from each material (diameter 10 mm and thickness 2 mm) were prepared against glass from four polyamide (T-crystal, Deflex, Valplast, Bre-flex) and one PMMA (Meliodent) denture base materials. After manufacturing, half of the specimens selected randomly were subjected to 10,000 thermocycles with a dwell time of 30 sec, between 5 to 55°C. A frozen pre-culture of the strain *S. epidermidis* were transferred onto an agar plate and incubated at 37°C for 48 h. A single colony was incubated with sterile Mueller Hinton Broth at 37°C for 24 h, and subsequently kept at 4°C. Cells were harvested by centrifugation, washed twice with phosphate buffered saline and resuspended in the same buffer the optical density of the bacteria suspension was adjusted to 0.3 at 550 nm. Then the specimens were placed into an agitated culture of the strain at 37°C for 48 h. Quantification of bacteria was done by Wilcoxon signed rank test and Bonferroni Adjustments (p < 0.005).

Results: There is statistically significant differences between tests materials, and test groups.

Oral Health Status and Related Factors in A Group of Dental Patients

Ayşe Gürkahlı, Çiğdem Çelik, Bulem Yüzyügüllü

Objective: To investigate the relation between oral health status and, oral health behavior and sociodemographic factors in a group of dental patients.

Materials and methods: The data were collected from 500 patients, aged between 13–71 years. Oral health behaviour was assessed with questionnaire. Oral health status was assessed both clinical and radiologic examination. The radiologic examination included a panoramic radiograph and periapical radiographs when seen necessary. Oral health status was evaluated using the World Health Organization caries diagnostic criteria for decayed, missing and filled teeth (DMFT). A multiple linear regression analysis was conducted to relation with DMFT index.

Results: Of the patients, 185 (37%) were male and 315 (63%) were female. The mean age of the study population was 32.97 ± 13.11 years. The mean age for visiting a dentist for the first time was 13.82 ± 8.43 years. The average DMFT score was 8.01 ± 5.64. As age increased, DMFT score was increased as well (p < 0.001). While education level was increased, missing tooth was decreased (p < 0.001); but filling tooth was increased (p < 0.001). Other sociodemographic factors and oral health behaviour were not related to oral health status.

Conclusion: According to the results, age and education level was significant predictor for oral health status in this study population.
Introduction: The ameloblastoma originates from odontogenic ectodermal epithelium with differentiation in to ameloblasts. Ameloblastoma is a benign odontogenic tumour, which often shows aggressive growth and a high recurrence rate after conservative surgical treatment. Unicystic ameloblastoma is considered to be a less aggressive form of ameloblastoma. Conservative surgical treatment is thought to be adequate for the majority of cases.

Case: In this case report, a 1.5-year-old boy referred to our clinic with the complaint of collapse in his symphysis region. Radiographic examination revealed an unilocular radiolucency in this region. The lesion was enucleated totally, two teeth germ extracted under general anesthesia and was diagnosed as unicystic mural type ameloblastoma by histopathological examination. After the surgery, complete healing was obtained clinically and radiographically.

Conclusion: No sign of recurrence was seen during the follow-up period of 2.5 years. To the our knowledge, this is the youngest case ameloblastoma in the english literature.

Salivary Flow and Buffering Capacity in Patients with Cardiovascular Diseases

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Background: Cardiovascular diseases are the main cause of death in many countries. There has been widespread discussion on the influence of medications that could alter salivary flow.

Objective: This study aimed to identify the influence of medications used by cardiac patients, prior to heart surgery, on their salivary flow and pH.

Methodology: The study included 70 adult patients with heart disease. Investigation of their socioeconomic profile, baseline heart diseases, medications used and evaluation of pH and salivary flow were performed.

Results: The mean age was 50 years and 52.9% of the patients were males. Among the heart diseases, 52.9% were valve diseases, while 35.8% were individuals with coronary artery disease (CAD). Hypertension was present in 58.5% and diabetes in 22.8%. Platelet antiaggregants, statins, hypoglycemic agents and especially beta-blockers were the major drugs shown to be responsible for reduced saliva flow, while the buffering capacity of saliva was considered normal.

Conclusion: There was a positive relationship between decreased salivary flow and the use of medications, especially beta-blockers, whereas the saliva-buffering capacity was normal. Such patients require rigorous oral hygiene including thorough brushing, the use of dental floss and antiseptic mouthwashes, and shorter intervals between tooth cleanings. The use of artificial saliva, when flow reduction is confirmed, has been shown to be an appropriate therapeutic method for controlling these symptoms, in addition to certain drugs that facilitate the recovery of normal salivary flow.

Surgical and Dental Treatment of Extra-oral Fistula: Two Case Reports

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Introduction: Dental infections are common lesion in the mouth and many of them are localised and are treated by dentist. Odontogenic infections can be disseminated along the circumambient structure, such as alveolar bone and soft tissues. In case it isn’t treated completely, a sinus with an external opening, which named oro-cutaneous fistula, can be comprised on the face.

Case 1: A 32-year-old female patient who had small seropurulent discharging lesion located anterior mandibular region with 2 months history was presented to Gaziosmanpasa University, Faculty of Dentistry. The surrounding skin appearance was normal. According to the intraoral examination, there were full mouth bridges and the radiographs confirmed that there was apical radiolucent lesion around the lower incisor teeth and left canine. Furthermore, failed root canal treatments observed. Teeth were retreated by endodontist and apical resection operation was performed. At the same time the resection of oro-cutaneous lesion was reconstructed extra-orally by surgeons.

Case 2: A 13-year-old female patient who had small submental oro-cutaneous lesion with 3 week history was presented to Gaziosmanpasa University, Faculty of Dentistry. The surrounding skin appearance and intraoral examination was normal. There was apical infection around the lower incisor teeth in radiographic examination. The root canal treatment and the surgical treatment of patient was carried out by the same team as mentioned above.

Conclusion: Early diagnosis of the underlying dental infection is essential and surgical reconstruction of discharging lesion with dental treatment and oral surgery is also important for recurrence of the lesion.

Dental Patient, Drugs and Dental Treatment – Corticosteroids

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Aim: Corticosteroids are synthetic versions of cortisone, a hormone produced by the adrenal glands, and are widely considered «miracle» drugs, capable of restoring health and save the lives of people suffering from a wide range of serious diseases.

Materials and methods: Corticosteroids suppress the immune system and inflammation, preventing the progress of numerous diseases. On the other hand, their often observed side effects can be just as serious as the diseases. Over the past years, corticosteroids have been also found to be responsible for a series of adverse effects in the oral cavity such as osteonecrosis of the jaws and metallic taste. Furthermore, increase of risk of jaw osteonecrosis can be observed in cases of simultaneous intake of corticosteroids and other drugs such as bisphosphonates or other immunosuppressive drugs.

Results: In dentistry corticosteroids are widely used in various specialties. In stomatology local application of corticosteroids is considered to be the primary therapeutic approach in treatment of oral ulcers, whereas more severe cases demand parenteral administration. Parenteral administration of specific drugs is also recommended in the treatment of various autoimmune diseases that exhibit manifestations in the oral cavity, as well as other inflammatory diseases.

Conclusions: Despite the positive effect of corticosteroids on the systemic health, the administration of such drugs should be made with caution due to the often observed side effects. Close monitoring is also recommended as osteoporosis, increase of blood sugar and blood pressure, weight gain, fissures in the skin, cataract etc. may occur during treatment.

Ethical Evaluation of Informed Consent at Dentistry of a Public Hospital
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Purpose: At the implementation stage, a status assessment is conducted about receiving the informed consent of the patients at the dentistry clinic and some courses of actions are proposed about the issues, those are required to be developed.

Materials and methods: This research has been conducted by reaching 90.9% (60 personnel) of the whole dentists at a public hospital. A questionnaire containing 34 items was implemented. The relations of the total scale points of each part with the individual variables were investigated and the data was evaluated by using SPSS 15.0 statistics program.

Result: According to the results of the questionnaire implemented: 36.7% of the participants stated that they received the ethical training during the dentistry education; related to the ethical and legal issues 51.7% of the participants stated that s/he needs to have more information; 68.3% of the participants found their knowledge on the “informed consent” as partially adequate; 38.3% of the participants stated that the information should be delivered to the patient orally by the physicians and by using the written brochures; 71.7% of the participants stated that the informed consent of the patient should be received with a document signed by the patient and the physicians. It is proposed for the physicians that, they should be cautious at the stage of receiving informed consent and should inform the patient through all aspects for more confident implementation of dentistry practice.

Halitosis and Related Factors in Patients with Chronic Renal Failure
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Objective: To analyse the relation between the VSC levels (especially dimethyl sulfide level), and organoleptic measurement and blood urea nitrogen levels (BUN) of a group of patients with Chronic renal failure (CRF).

Materials and methods: A total of 50 patients with CRF and together with 28 healthy subjects was included the study. One trained examiner performed halitosis measurements prior to and after hemodialysis. To determine the halitosis both organoleptic measurements and VSC measurements by using a portable gas chromatography were performed. Statistical analyses was performed by using Mann-Whitney U test, Wilcoxon signed ranks test and chi square test.

Result: While no significant difference observed between the hydrogen sulfide and methyl mercapitan levels of the CRF patients and controls before HD (p > 0.05); dimethyl sulfide levels were significantly higher in the CRF patients than controls (p < 0.05). Compared with before and after HD, there were statistically significant decreases in hydrogen sulfide, methyl mercapitan and dimethyl sulfide levels of the CRF patients (p < 0.01). Prior to HD, organoleptic measurement levels were not correlated with hydrogen sulfide and dimethyl sulfide levels; but methyl mercapitan level was significantly correlated with organoleptic measurement (p < 0.05). After the HD, organoleptic measurement levels were not correlated with hydrogen sulfide, dimethyl sulfide and methyl mercapitan levels (p > 0.05). BUN levels were not correlated with hydrogen sulfide, dimethyl sulfide and methyl mercapitan levels neither prior to nor after HD (p > 0.05).

Conclusion: Hemodialysis may play an important role in decreasing the level of halitosis chronic renal failure patients.

Patients’ Knowledge of the Relation of Dental Health and Systemic Diseases
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Objectives: The objective of the study was to assess the patients’ knowledge about oral health and dental caries associated with systemic diseases, habits and nutritional factors.
Materials and methods: A 20-item cross-sectional questionnaire was delivered to 600 patients, who were treated at Istanbul University Department of Operative Dentistry clinic. Patients who agreed to answer the detailed questionnaire were participated in the study. All of the questionnaires were carried out as interviews by two dentists. Only fully completed questionnaires were evaluated by SPSS 21.0, and the significance of association between variables were analyzed using chi-square tests.

Results: Of the 600 patients, ages ranging from 18 to 80 years, 59% were females and 41% were males. According to the data obtained, 79.5% of the patients had systemic diseases, smoking/alcohol habits. Compared with the others, smoking 49% was the most frequent habit among patients. Forty six percent of the patients had their diseases under control, and 61% of them had never been directed to a dentist by their physicians. As a result, there was a significant difference between patients thinking that systemic diseases show specific oral symptoms, and patients perceiving systemic disease as a reason for their oral problems (p < 0.001). Only 3.5% of participants answered all of the questions correctly when the knowledge of cariogenic nutrition was evaluated. In conclusion, showing a high prevalence of systemic diseases, patients had inadequate knowledge of the relationship between oral and general health.

P755
Cytotoxicity of the Polyalthia Evecta on Human Primary Osteoblast Cells
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Purpose: Polyalthia evecta (P. evecta) (Pierre) Finet & Gagnep has been used for Thai traditionally herbal medicine as a galactagogue and a carminative. It has been reported that 50% ethanol-water extraction of P. evecta showed the antioxidant activity and anti-inflammagicity. Moreover, it has been shown anticancer effect on human hepatoma cell line (HeptG2). However the effect of P. evecta on osteoblast cells is yet unknown. Thus, the aim of this study was to evaluate the cytotoxic activity of P. evecta on human primary osteoblast cells.

Materials and methods: The bark of P. evecta was extracted by 50% ethanol-water and freeze-dried method. Human primary osteoblast cells were treated with P. evecta at concentrations of 31.25, 62.5, 125, 250, 500 and 1000 μg/ml. Cytotoxicity was determined by MTT assay at 24 h incubation.

Results: The result showed that P. evecta treatment had no effect on cytotoxicity. Additionally, human primary osteoblast cells, which treated with P. evecta, especially ranging from 31.25–250 μg/ml, had cell proliferation higher than that of the control group.

Conclusions: This study demonstrated that P. evecta did not affect on cytotoxic activity of human primary osteoblast cells. Furthermore, P. evecta promoted cell proliferation. This result was the fundamental data for the further study for the effect of P. evecta on osteoblast cells in other aspects such as bone formation and anti-inflammation.

P756
Knowledge and Awareness about needle stick injuries among dental students and staff - An Institutional study
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Aim/Objective: To ascertain knowledge and awareness of dental students and staff regarding needle stick injuries (NSI) before and after awareness lectures on NSI and post exposure prophylaxis (PEP).

Methods: A Cross sectional survey was conducted among the consenting dental students of 3rd, 4th years, and staff at Faculty of Dentistry, Melaka Manipal Medical College, Melaka, Malaysia. Pre-tested questionnaires were administered to 70 students, 10 staff and 10 para dental staff before and after a series of awareness lectures on NSI and PEP.

Results: The response rate of the survey was 100%. The areas covered in the questionnaire were regarding the diseases transmitted by NSI’s, risk of transmission, high risk fluids, first aid measures to be taken after NSI, PEP administration, necessity to monitor patients HIV/Hepatitis status, and whom to contact in case of NSI. The overall awareness before the lectures was rated to be 59.5% among the 3rd year students, 61% among the 4th year students and 67.5% among the staff. After the awareness lectures, a significant increase in the knowledge and awareness was found among the 3rd years, 4th years and staff with 85.7%, 91.5% and 93.2% respectively.

Conclusion: Overall knowledge and awareness of dental students and staff regarding various aspects of needle stick injuries improved significantly following awareness lectures. This implies that more awareness programmes need to be organised to improve the knowledge among various health care professionals.

P757
Masticatory Process - The Effect of Diabetes in Function of Stomatognathic System
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Aim: The objective of this study was to analyze the electromyographic activity of masseter and temporalis muscles, right and left.

Methods: Sixteen subjects 23–59 years, divided into two groups: Group I (diabetic) and Group II (control) during habitual chewing of different foods. The subjects were matched for each subject was nasal breathers. The masticatory process was assessed through electromyographic signal (Myosystem – BR3.5 – DataHominis Ltda – Brazil) with differential active electrodes (silver bars 10 mm apart, 10 mm long, 20 × gain, input impedance 10 GΩ and 130 dB common mode rejection ratio). Surface differential active electrodes were placed on the skin on both masseter and temporalis muscles. The signals were digitally filtered using a bandpass filter of 10–500 Hz in the data processing. The data were obtained during habitual chewing of peanuts and raisins (5 g each), for 20 s.

Results: The average EMG were tabulated and subjected to statistical analysis using t-test (SPSS 19.0). It was found that individuals with diabetes had the lowest averages for the two chews, with a significance level of 5% (p < 0.05), but the activation pattern of the masseter and temporalis muscles were similar to the control group, with masseter more active than the temporalis, especially during mastication of hard food (peanuts).

Conclusion: It was concluded that diabetes caused alterations in muscle fibers request during the masticatory process, highlighting the need for health professionals to be aware of this change in the stomatognathic system of individuals with this chronic degenerative disease.

P758
Chewing Prevents Stress-Induced Heart Failure in Rats
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Aim: It is now well established that stress causes autonomic imbalance to promote cardiovascular diseases. We investigated whether chewing during stress acts as an active coping strategy to prevent stress-induced heart failure in the right ventricle (RV) hypertrophy rat model.

Materials and methods: We induced pulmonary hypertension and RV hypertrophy in male SD rats by intraperitoneally administering a single dose of monocrotaline (MCT, 60 mg/kg). The rats were divided into three groups of: (i) no stress group (M), (ii) stress group (MS), and (iii) MS with chewing group (MC). The survival rate of all rats was followed up for 6 weeks after the MCT injection, at which their heart and lung tissues were harvested. Rats in the MS and MC groups were subjected to 1 h of immobilization stress twice a week from 3 weeks after the MCT injection. Rats in MC groups were allowed to chew a wooden stick during the immobilization stress. We used the ratio between RV weight and the weight of the left ventricle and interventricular septum (RV/LV+S) as the index of RV hypertrophy.

Results: Chewing significantly reduced stress-induced increase of lung weight (M: 2598 ± 236 mg, n = 10; MS: 3597 ± 373 mg, n = 7; MC: 2368 ± 177 mg, n = 8; p < 0.05) and RV/LV+S ratio (M: 0.54 ± 0.05%, MS: 0.60 ± 0.06%, MC: 0.58 ± 0.06%). Chewing also improved the survival rate (M: 50%, MS: 35%, MC: 40%).

Conclusion: The results suggest that chewing under stressful conditions might relieve stress-induced lung remodeling and progressive heart failure.

P759
Dentists’ Knowledge on the Oral Manifestations of Systemic Diseases
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Objectives: This study aims to identify, compare and analyze the knowledge and opinions of dentists regarding oral manifestations of systemic diseases.

Materials and methods: An 18 items in a cross-sectional survey were used in investigation of demographic attributes, dental practice characteristics, knowledge of oral manifestations and opinions of dentists and were delivered to 466 dentists all over Istanbul. Only fully completed questionnaires were used in the data analysis. Descriptive statistics were analyzed by using chi-square tests.

Results: Of the 466 dentists, ages ranging from 21 to 52 years, 53% were females and 47% were males. According to collected data, 99% of the dentists reported that systemic diseases manifest themselves by certain oral manifestations. Compared to the other systemic diseases, dentists reported that diabetes had specific oral manifestations (100%) and only 19.4% of them thought that cardiovascular disease had specific oral manifestations. At the same time about 99.6% of the dentists declared that early detection of abnormal oral manifestations can be helpful in early diagnosis of underlying diseases. On the other hand 90.8% of the dentists mentioned that team-work treatments side by side with physicians must be planned to achieve the optimum benefits.

Conclusion: In conclusion the dentist’s knowledge about oral manifestations are insufficient to fulfill the questionnaire so educational programmes about diagnosing oral symptoms of systemic diseases should be supported by dental associations.

P760
Incisor the Early Loss of Primary Teeth Due To Oral Bad Habit: Case Report
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Introduction: Early loss of primary teeth in children is usually associated with systemic diseases or aggressive periodontitis other than dental caries. This systemic diseases include hypophosphatasia, leukocyte adhesion deficiency, neutropenia, Papillon-Lefèvre syndrome and Langerhans’ cell histiocytosis. Early loss of primary
teeth in children with bad oral habits that frequently encountered in routine clinical examination is a quite rare and atypical case. The aim of this case report is to present an unprecedented case which include loss of primary teeth due to biting foreign objects.

**Case Report:** Clinical examination of a 2-year-old male patient’s parents without a systemic disease admitted to our clinic with complaint of lack of teeth it was observed that teeth numbers 81, 82, 83 were not in the mouth and in radiographic examination only tooth germ number 82 was observed in that area. According to the anamnesis there was no traumatic injury at that region but as a result of a bad habit about biting foreign objects and pull them out rapidly.

**Result:** In children bad oral habits seem so frequently but due to this situation tooth loss is so rare. To determine bad oral habits in children at early stages is so important for not only to prevent the developmental defects of face and occlusion and also to avoid early tooth loss because of chronic trauma.

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**P761**

**Effects of Solar-Powered TiO2 Semiconductor on Oral Biofilm**

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**Aim:** The formation of bacterial biofilm on tooth surfaces brings about caries and periodontitis, one of the most common oral diseases of human. Biofilm removal by toothbrush plays a crucial role in the prevention of caries and periodontitis. However, there have been no reports on biofilm removal ability of an electric toothbrush with solar-powered titanium dioxide (TiO2) semiconductor. In this study, we investigated effects of solar-powered TiO2 semiconductor on oral biofilm.

**Materials and methods:** *Streptococcus mutans* and *Porphyromonas gingivalis* were grown in brain heart infusion broth at 37°C under anaerobic condition. The cover glasses were coated by bacteria (108 CFU/ml) and cultivated anaerobically at 37°C for 18 h. After incubation, solar-powered TiO2 toothbrush was placed on the covered glasses and brushed for 1 min under illuminating with a blacklight at a distance of 7 cm. After mechanical brushing, the cover glasses were stained with 1% crystal violet (CV) for 10 s at room temperature. Biofilm removal ability was evaluated from the absorbance of CV stained solution containing removed biofilm at 492 nm in a spectrophotometer.

**Results:** The electric toothbrush with solar-powered TiO2 semiconductor, bacterial removal rate of *S. mutans* was 75.0% and that of *P. gingivalis* was 88.7%. These rates were significantly greater than those of an electric toothbrush without solar-powered TiO2 semiconductor (p < 0.01).

**Conclusions:** In these results, we suggest that photocatalytic property of TiO2 and electric current of solar battery contribute the reduction of bacterial biofilm and promote the prevention of caries and periodontitis.
non-ergonomical ordinary dentist stool. Even though the majority of the participants were young dentists, 98.6% of them hadn’t been using new magnification devices (dental loops, operation microscopes...) and 94.41% hadn’t been doing stretching exercises during microbreaks. 56.74% of the participants indicated that they had had an education about ergonomic principles. 90.69% of the participants stated that, their working conditions aren’t ergonomical because of most frequent; inadequate resting time (36.13%), excessive work load (50%) and unsuitable environmental conditions (crowd, noise, air pollution...) (45.28%), respectively.

Conclusions: Although, it was seen that dentists’ education about ergonomical principles is enough, their unfavourable environmental and working conditions (equipments, time planning...) must be reorganized ergonomically.

P764
Psychosocial Profiles of Patients in Different TMD Diagnostic Subgroups
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Aim: To compare psychosocial characteristics in research diagnostic criteria for temporomandibular disorders (RDC/TMD) diagnostic groups.

Materials and methods: One hundred forty-four consecutive patients (119 females, age range 18–36 years) diagnosed to have at least one of RDC/TMD Axis I diagnoses were recruited from subjects referred for TMD treatment from January 2011 to December 2012. Depression, somatization, and chronic pain grade were evaluated according to RDC/TMD Axis II scoring protocol. Data were subjected to Kruskal–Wallis and Mann–Whitney tests at a significance level of 0.05.

Results: According to our results, patients diagnosed with myofascial pain had higher depression and somatization scores comparing to patients with arthralgia (p = 0.046, p = 0.018, respectively). Patients with disc displacement reported significantly lower levels of chronic pain and related disability than patients with myofascial pain and arthralgia (p < 0.001, p = 0.017, respectively).

Conclusions: The results suggest that patients with various clinical TMD diagnoses may differ in psychosocial profiles. Psychological distress experienced by patients with myofascial pain is higher than in patients with arthralgia. Patients diagnosed to have pain-related TMD diagnoses are characterized by higher level of chronic pain and related disability.

P765
Delayed Eruption of Primary and Permanent Teeth
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Aim: The aim of this presentation was to discuss possible causes and the terminology of tooth eruption problems.

Materials and methods: Clinical findings, periapical, panoramic and cone beam computed tomography imaging examinations of patients with delayed primary or permanent tooth eruption were evaluated. Possible causes of delayed tooth eruption were determined.

Results: Possible causes of delayed tooth eruption were determined as odontogenic cysts and tumors like dentigerous cysts, odontomas; supernumerary teeth; ankylosis; premature loss of primary tooth; lack of resorption of deciduous tooth; positional deviations and systemic disease like hypothyroidism.

Conclusion: The clinicians should be aware of possible causes of delayed tooth eruption in order to prevent retarded and difficult treatment procedures.

Theme: Implantology: Implantology

P766
Gender-Based Prevalence of Peri-Implant Disease
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Background: The objective of this study was to evaluate sexual dimorphism in peri-implant disease.

Materials and methods: Out of 433 patients, 234 women and 85 men were matched according to patient and implant characteristics. Effects of gender and confounding factors were tested in a binomial frailty model. Mean age in women was 61 ± 12.7 and 59 ± 13.1 in men. The mean loading time was 6.9 ± 4.3 for women and 6.8 ± 5.6 for men.

Results: The 313 patients had been treated with 1461 implants. Mean marginal bone loss did not significantly differ between genders. Early loss was higher in men (p = 0.01) while late implant failure occurred significantly less in men (p < 0.05). Also men had a lower prevalence of peri-implantitis (p < 0.01). A moderately rough (p < 0.01) and rough surface (p < 0.01), plaque (p < 0.01) and smoking (p < 0.05) are risk indicators for late implant failure. Smoking and periodontitis are risk indicators for peri-implantitis (p < 0.05) in both genders. Other risk indicators for peri-implant disease differ between genders.

Conclusion: Gender has an influence on peri-implant disease and risk indicators differ between men and women.
P767
Bone Augmentation with Allograft Block in Esthetic Site: Case Report
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Purpose: The purpose of this study was to show the usage of cancellous allograft bone block (CABB) for alveolar ridge augmentation of the maxilla in preparation for dental reconstruction with endosseous implants, as an effective alternative to harvesting and grafting autogenous bone from intra- or extra-oral donor sites.

Materials and methods: The case presented clinically demonstrates the usage of CABB in the augmentation of a severe maxillary atrophy in local anesthesia, and the outpatient treatment with implants insertion and prosthetic restoration.

Results: Clinical outcome is shown with good volumetric and morphological reconstruction of the alveolar ridge in cone beam computed tomography. Excellent graft integration and bleeding newly formed bone was seen at 4 months after operation, when fixation screws were removed and implant placement procedure was performed.

Conclusion: The usage of CABB in major preprosthetic surgery may be an acceptable therapeutic alternative to the autogenous block graft for its success rate as graft material.

P768
Treatment of Early Bone Loss around A Dental Implant with Demineralized Bone Graft and Plasma Rich Fibrin: A Case Report
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Background: Peri-implantitis can be defined as an inflammatory lesion around dental implant tissues with bone loss. Peri-implantitis can become before and after the loading of the implants with prosthetic restorations. In the treatment of peri-implant defects bone regenerative procedures have been applied with successful results. Platelet rich fibrin (PRF) have been presented as an membrane like material in the treatment of bone defect. This clinical report presents the possible reason for early bone loss around dental implants and the treatment of peri-implantitis with demineralized bone graft and PRF.

Case: At a 31 year old male patient with dental implant on tooth numbered 15# that applied 3 months ago, a radiolucency around the implant had noticed in control radiography. Intraoral examination revealed slightly mucosal changes in color and there was a clear alvelar crestal bone loss at periapical radiography. In treatment, flap opened, bone defect area cleaned with mechanical debridment and filled with demineralized bone greft material and covered with PRFs. Three months later new bone regeneration observed at periapical radiography, after 1 year, intra-oral examination revealed an established healthy peri-implant soft tissue with no bleeding or no bone loss at periapical radiography.

Conclusion: Dental implants should be followed frequently for the risk of early bone loss. Peri-implantitis can be succesfully treated with deminerlized bone graft and plasma rich fibrin as a membrane at bone regeneration procedures.

P769
Removal of a Fractured Abutment Screw: A Clinical Report
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Introduction: Although high success rates have been reported related to implant supported prostheses, unfortunately clinicians and patients still can encounter mechanical complications that are not uncommon. These complications can be observed as veneering material fracture, prosthetic screw loosening, prosthetic screw fracture, implant fracture or framework fracture. Retaining and abutment screw loosenings/fractures are one of the most common technical problems.

Case: A 62-year-old male patient, whose upper right posterior edentulous site restored with a cantilever bridge supported by two implants, had a fractured abutment screw in an anterior implant body. Although attempts were made to remove the fractured fragment by dental explorer and periodontal probe, they were useless. This clinical report presents the removal of fractured abutment screw fragment using an implant service set.

P770
Successful Treatment of a Patient with Reparative Giant Cell Granuloma: 5 year Follow-Up
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Background: Reparative giant cell granuloma (RGCG) is usually a asymptomatic benign lesion of the attached gingiva or the perios- teum of the alveolar ridge. The etiology of RGCG is not clearly described. Some investigators mentioned that trauma can be a reason for the development of lesions. Extensive lesions usually cause esthetic problems due to the excision of the lesion, root exposure and in some cases tooth loss.

Aim: The aim is this case report is to treat the defect caused by reparative giant cell granuloma with surgical and prosthetic procedures functionally and esthetically.

Case Presentation: A female patient was referred to Istanbul University Faculty of Dentistry Department of Periodontology clinic with gingival enlargement around her right maxillary central incisor. Following initial periodontal treatment, the enlargement was resected and the effected tooth was extracted. According to patho- logical examination it was diagnosed as reparative giant cell granuloma. After waiting for 7 weeks, the defect site was augmented...
Materials and methods: In patients in a private practice showed excellent 3-year survival. Probing was only performed when clinical signs of inflammation were present and then evaluated with intra-oral radiographic examination. The survival and success rates of the implant-supported prosthesis were evaluated following 1 year of loading.

Results: Three years after implant placement, no fixtures were removed because of loosening. One implant was lost 3 months after cementation of prosthetic restoration. In two different patients three implants, 1 in maxilla and 2 in posterior mandible were lost before prosthetic loading during impression taking procedure. No other prosthetic complications occurred, giving a 98.79% cumulative survival rate.

Conclusions: Dental implants placed according to two-stage procedure in patients in a private practice showed excellent 3-year results. This may be a result of multidisciplinary approach of surgeon and prosthodontist, paying attention to organized recall sessions to keep oral hygiene, parafunction and other patient oriented factors under control. Long-term follow-up data is needed to confirm these results.

Aim: The aim of this study is to evaluate the effect of implant locations on the stress around the two different attachment systems in mandibular two-implant overdentures.

Materials and methods: The data obtained from Visible Human Project were modified with the use of VRMESH and Rhinoceros 4.0 software to establish a 3D mandible model with 2 mm cortical bone covering the trabecular bone and 2 mm mucosa. Three Dimensional models (totally 6 models) of mandibular two-implant overdenture were designed according to different implant locations [lateral-lateral (LL), lateral-canine (LC), lateral-second premolar (LP)] and attachment systems [ball (BA), locator (LA)]. Foodstuff was used for occlusal loading (100N) and to simulate different biting configurations, foodstuff was positioned on incisors (anterior) and between the second premolar and first molar (posterior) bilaterally. The finite element analysis was performed by ALGOR FEMPRO software and von Misses stresses on attachments were evaluated.

Conclusion: For symmetric configuration (LL), there was more von Misses stress on BA compared to LA when foodstuff was positioned posteriorly. For asymmetric configurations (LC and LP), when the implant in the asymmetric side was positioned more posteriorly, von Misses stresses increased on both BA and LA of the implant positioned in the opposite side. In LC configuration, on BA higher von Misses stresses detected when compared to LA, whereas in LP configuration the higher stresses determined on LA when foodstuff was positioned posteriorly. In LL and LP configurations, LA showed lower stresses, which should lead the clinician to choose the appropriate attachment system according to the individual clinical situation.

Aim: The aim of this study is to evaluate success and survival rate of three different brands of implants. Three hundred and thirty-one implants placed and loaded according to conventional procedures in a private practice.

Materials and methods: One-hundred and fifty healthy adult patients scheduled for implant-supported restorations were included in the study. One Seventy nine final fixed prostheses supported by 331 implants (184 ITI, Straumann AG, Basel, Switzerland; 42 BioHorizons, Atlanta, GA and 103 Zimmer Dental Implant, Carlsbad, CA, USA) were placed according to conventional procedure. All patients were treated according to two stages protocol. All implants were incorporated in a prosthetic restoration. Probing was only performed when clinical signs of inflammation were present and then evaluated with intra-oral radiographic examination. The survival and success rates of the implant-supported prosthesis were evaluated following 1 year of loading.

Results: Three years after implant placement, no fixtures were removed because of loosening. One implant was lost 3 months after cementation of prosthetic restoration. In two different patients three implants, 1 in maxilla and 2 in posterior mandible were lost before prosthetic loading during impression taking protocol. No other prosthetic complications occurred, giving a 98.79% cumulative survival rate.

Conclusions: Dental implants placed according to two-stage procedure in patients in a private practice showed excellent 3-year results. This may be a result of multidisciplinary approach of surgeon and prosthodontist, paying attention to organized recall sessions to keep oral hygiene, parafunction and other patient oriented factors under control. Long-term follow-up data is needed to confirm these results.

Aim: The use of acetal resins in implant abutment combines high aesthetics with ease of use and high elastic memory. They also have a high resistance to abrasion, excellent tensile and shock strength, high elastic memory, low thermal conductance and rigidity. They also are neither allergenic nor toxic. The new prefabricated abutments that can be prepared, allow ease of use in dental clinic, thus providing both advantages but also difficulties due to the need of special equipment in order to use them. Their use in creating an implant abutment has opened a new field of use for these materials.

Materials and methods: Several cases of edentulism are presented where the TMI True Max Implant was used. These implants are in the anterior and posterior region and different types of acetal resin abutments were used. They were tested for at least 2–5 years looking for structural changes and possible problems.

Results: The gathered results are represented visually in the presentation.
Conclusions: The acetal resins represent good capacities in reconstructing the implant abutment. They represent ease of use, high esthetics achievement, reduced working time and are relatively cheap. The fiber reinforced acetal resin makes in our opinion one of the best solution for the implant abutments.

P774
Prosthetic Restorations using CBCT and Implant Procedures
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Aim: Prosthetic restorations are, in many clinical situations, very difficult due to different axis of implants. The authors present their experience in the prediction of architecture of the fixed and removable prostheses. Preprosthetic implant imaging using CBCT allow to observe the surgical site and its relationship to the planned restorations.

Materials and methods: Thirty-two patients who where diagnosed with multiple edentations caused by various factors (decays, periodontal disease, trauma, etc.). For everyone was realized a surgical guide according to surgical protocol and finally to prosthetic plan. The titanium surgical guide was produced by the 3D model using CBCT. Surgical procedure was planned and realized using surgical guide tooth-supported (21 patients) or mucosa supported (11 patients). In 12 cases was necessary bone addition to correct bone loss caused by pathological origin or to add in the sinus floor elevation. One hundred and six implants were introduced using surgical guide under local anesthesia.

Results: Immediate results using surgical guide are excellent only if are respected the surgical plan and adequate protocol. In three cases was necessary to re-suture the surgical wound caused by local conditions of oral flaps. Failure of implants was observed only in four cases due to inadequate bone quality.

Conclusions: Implant surgical procedures using prefabricated surgical guide are improved only if we use an adequate protocol both in planning and in the accurate technique.

P775
Screw-Cement Retained Implant Restorations in One Rigid Fixed Partial Denture
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Introduction: In implant therapy, the debate between screw -vs. cement -retained implant prosthesis has long been discussed. Making the right decision to select the ideal prosthesis for each case, implant position, interocclusal space, advantages and disadvantages must be considered.

Case: A 50 year-old female patient referred to our clinic at Ankara University, Faculty of Dentistry for her dental treatment. We decided to rehabilitate the patient with maxillary full mouth metal-ceramic fixed partial dentures using implants for edentulous areas (14, 17, 22, 24, 26). Limited interocclusal space inflict us to plan screw retained implant restorations. However, because of unfavorable position of lateral incisor (22) implant, we had to use angled abutment. Screw retained implants necessitate ideal inclination, so we had to plan to use cemented abutment for the implant number 22 together with screw retained abutments for the implants number 24 and 26 in a five unit bridge. Occlusal adjustments were made to eliminate excussion stresses on the implant number 22 and canine pontic area. Lateral excussion contacts were tired to make with most of the premolar and the molar teeth for the working side. For esthetic expectations we made conventional metal ceramic restorations for maxillar anterior incisors (11, 12, 13, 21) too.

Conclusion: In this case, patient was satisfied about esthetics and function. Clinic and radiographic controls were made at 6 months and 1 year intervals. No complication was observed.

P776
Influence of Chitosan Coating to Titanium on HGF-1 Cells Attachment and Proliferation in Vitro
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Aim: The aim of this study was to evaluate the biocompatibility and the influence on the HGF-1 attachment of chitosan on titanium surfaces.

Materials and methods: Three groups were prepared (n = 3). These were unprocessed, chitosan coated and aged after chitosan coated. In order to define the chemical composition of the surfaces, SEM linked EDS device was aimed for usage. The presence of phases and bonds was characterized by XRD and FTIR spectroscopy. Biocompatibility was evaluated by MTT cell viability assay. HGF-1 cells were selected as model to recognize fibroblastic cell attachment and proliferation. Statistical significance was determined by one-way ANOVA with Bonferroni correction.

Results: According to the analysis, presence of C, H and O elements in the SEM linked-EDS device indicated that coating processes was successful, although chitosan was not observed in XRD measurement at chitosan coated titanium and chitosan coated and aged samples. In addition of these results, FTIR patterns showed the presence of characteristic bands of chitosan on the titanium surfaces. On the other hand, it was concluded that aging process decreased the amount and efficacy of chitosan. Fibroblastic cell attachment and proliferation of HGF-1 cells were enhanced with chitosan coated surfaces significantly.
Conclusion: Chitosan is one of the popular coating material for biomedical sciences. According to results of this study, it can be concluded that chitosan coating is effective for titanium surfaces biologically.

P777
Removal and Replacement of Fractured Zirconia Abutment, Case Report
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Case: A 58-year-old male patient presented with fractured upper left central incisor cervically in a very strange way, two oblique lines meet coronally. Tooth was treated for endodontic and prosthetic, a temporary crown. But, tooth could not withstand those treatments, So, Patient was advised to extract and replaced by implant with immediate non-functional loading. Later, Zirconia abutment was inserted and porcelain crown with Zirconia base was cemented. Two years later, patient came with fallen down crown for cementation, unfortunately, He bit on very hard subject resulted in fractured Zirconia abutment close to its base. To remove the abutment, I use orthodontic wire to engage the base of abutment to remove it. New final impression and new crown has been delivered.
Conclusion: Patient satisfaction is really high.

Theme: Implantology: Oral Medicine
P778
The Prognostic Concept: “Thick vs. Thin Gingival Tissue” in the Implantology
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Introduction: In a respect of a fact for the essential role of the actual concept: “thick vs. thin gingival tissue as a key determinant in the tissue response to disease and restorative treatment”, as well as, the possible periodontal bioprotective influence of the functional width of the attached gingiva.
Case: We have formed the aim of our clinical study- to determine the restorative effect in treated patients with detected thick or thin gingival tissue irrespective of the employed implantology technique; using different standard clinical indicative parameters. At the end of the 24 months clinical observation period, the obtained clinical findings showed that there is a correlation between the thick (voluminous) gingival tissue (always followed by functional zone of attached gingiva) and the implantology reconstructive treatment response, in comparison with the group of treated patients with verified thin gingiva, followed very often by unsatisfactory width of attached gingiva, bone alveolar dehiscence or fenestration, whose direct consequence was expressed (peri-implantitis) inflammation, bone resorption and early implant disintegration, suggesting the use of the prognostic concept as a crucial determinant in the implantology restorative treatment planning.

Theme: Implantology: Oral Surgery
P780
The Incidence of Tuberosity Fracture after Complicated Erupted Third Molar Extraction
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Introduction: Maxillary tuberosity fractures during molar teeth extraction can occur in dental practice; however, very few cases are reported and discussed in the literature. The extraction of a tooth requires that the surrounding alveolar bone be expanded to allow an unimpeded pathway for tooth removal. However, in general the small bone parts are removed with the tooth instead of expanding. Fracture of a large portion of bone in the maxillary tuberosity area is a situation of special concern.
Case: In this study we revised the incidence of fracture of tuberosity after complicated third molars extraction.

Theme: Implantology: Oral Pathology
P779
Reduced Expression of Smad4, a TGF-β Signaling Molecule, Correlates with Tumor Progression in the Oral Mucosa
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Aim: Transforming growth factor-β (TGF-β) acts as a tumor/metastasis suppressor in tumorigenesis. The objective of the present study was to compare the expression of Smad4, a signaling molecule of the TGF-β pathway, among normal oral mucosa, oral dysplastic epithelium and different grades of oral squamous cell carcinoma (OSCC).
Methods: A total of one hundred formalin-fixed paraffin-embedded tissue specimens were retrieved for this retrospective study. The samples comprised 20 normal mucosa, 20 dysplastic mucosa, 20 cases of OSCC (grade I), 20 cases of OSCC (grade II) and 20 cases of OSCC (grade III). We assayed Smad4 by performing immunohistochemistry using a mouse monoclonal anti-Smad4 antibody. Immunostained sections were evaluated by two investigators.
Results: Reduced Smad4 expression was significantly observed from normal mucosa to OSCC III.
Conclusions: The data suggest that decreased expression of Smad4, may be important in oral epithelial tumor progression.

Theme: Implantology: Oral Pathology
P781
Autotransplantation of A Permanent Maxillary Central Incisor Impacted by Compound Odontoma: A Case Report
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Introduction: The maxillary incisors are the most prominent teeth in an individual’s smile, they are also the teeth that are on maximum display during speech in most individuals and the normal eruption, position and morphology of these teeth are crucial to facial esthetics and phonetics. Impaction of maxillary permanent incisors occurs in 0.2–1% of the population. Eruption failure may occur if pathological obstructions, such as supernumerary teeth, odontomas, cysts, develop in the eruptive path of the incisor.

Case: The present report describes the surgical management of a case in which a maxillary central incisor was impacted because of an odontoma and successful autotransplantation of the teeth in a 13-year-old boy. A maxillary incisor (21) was transplanted into the alveolar sockets of the deciduous central and lateral incisor (61, 62) after extraction of the teeth and excision of the odontoma. Autotransplanted tooth is stabilized by orthodontic braces for 6 weeks and root canal treatment was done by then. After 1 year, clinical and radiographic examination revealed satisfactory outcome with no signs or symptoms suggestive of pathology.

Conclusion: In conclusion; autogenous tooth transplantation, even after complete root formation of the donor tooth, may be considered as a practical treatment alternative to conventional prosthetic rehabilitation or implant treatment. A high success rate can be achieved if the cases are selected and treated properly also should be considered the treatment of choice in the growing child.

P782

Head and Neck Cancer Effects on Masticatory Muscles
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Introduction: In front of the eight million new cancer cases that occurs today worldwide of which 212,000 are initiated on mouth, is necessary to study more influences of head and neck cancer disease on mastication.

Aim: The aim of this clinical study was to evaluate the electrical activity of masticatory muscles of patients with head and neck cancer and compare this data with healthy person.

Methods: The experimental group consisted of 35 patients (mean age 45 years) with head and neck cancer diagnostic. The control group consisted of 35 healthy subjects paired with experimental group according to age, gender and oral situation. The electromyographic (sEMG) activity of masseter and temporalis muscles was carried out at situations: rest, protrusion, right and left laterality, opening and closing mouth, parafilm chewing and clenching. Inter-group comparisons were made using independent sample t-test. Significance level was set at p < 0.05.

Results: There are statistic differences between groups in all postural activities tested (rest sig. value = 0.13, protrusion sig. value = 0.14, right and left laterality sig. value = 0.006 and 0.22).

On dynamic situations evaluated like opening and closing mouth, parafilm chewing and clenching was not verified statistic differences comparing groups.

Conclusions: The presence of head and neck cancer lesion can affect the maintenance of rest and postural position of mandible. People with head and neck cancer has a poor EMG activity during maintenance of mandibular postural position when compared to people that don’t have this disease.

P783

Radiation Therapy to the Head and Oral Health (Case Report)
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Introduction: Radiation caries is often consequence of radiation therapy to cancer of the head or neck. Also after radiation the full function and flow of the salivary glands does generally not fully return.

Case: Our patient came to us for careful dental examination after his radiation therapy because of worsened situation in his mouth. He had two bridges on the left and right side in the lower jaw, with dry mouth and many new developed caries lesions. The teeth with questionable prognosis were extracted and teeth with caries restored. We made circular bridge in the upper jaw and a few crowns in the lower jaw. After 3 years the patient came with extensive caries lesions on the teeth in the lower jaw, which start at the line of the gum and strangulate the teeth. The abutment teeth under the bridges were with periodontal disease and they must be extracted. So we treated the teeth and made new crowns and the partial denture in the lower jaw. Our patient has not take fluoride protection, so we recommended him daily fluoride treatments for the rest of his live.

P784

Peripheral Giant Cell Granuloma around Dental Implant: A Clinical Report
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Purpose: The purpose of this clinical report is to present the clinical management of peripheral giant cell granuloma (PGCG) around an implant, which was related to excess cement remnants.

Materials and methods: The patient who had complained about the gingival mass in the right maxillary posterior area referred to oral surgery clinic. Intra-oral examination demonstrated bleeding
localized lesion at the gingival mucosa around previously placed implant. Periapical x-rays revealed excess cement remnants at the level of abutment-fixure connection with no accompanying significant bone loss. The lesion was excised totally and the excess cement was removed. Histopathology confirms the diagnosis of PGCG. Patient was scheduled for regular visits in order to follow the healing of the soft tissue.

**Results:** One-year after surgery, uneventful healing of the patient with no recurrence was observed.

**Conclusion:** Clinicians should remove residual excess cements thoroughly while cementing implant supported crowns or bridges in order to prevent the possibility of the occurrence of peri-implant complications such as PCGG.

**P785**

**Large Parakeratinized Odontogenic Keratocysts: Report of Three Cases**

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**Aim:** The aim of this study is to present clinical and radiological features and the surgical managements of three patients with odontogenic keratocyst.

**Introduction:** Odontogenic keratocyst is a developmental cyst that was first described by Philipsen (1956). In the 2005 WHO classification of head and neck tumors, OKC was reclassified and renamed to Keratocystic Odontogenic Tumor (KCOT). WHO defined it as a benign uni/multicystic, intraosseous tumor of odontogenic origin, with a characteristic lining of parakeratinized stratified squamous epithelium and potential for aggressive infiltrative behavior. The peak prevalence is seen in patients in the second or third decades. The cyst characteristically grows within the medullary spaces of the bone in an anteroposterior direction and may reach a large size without causing obvious expansion of the jaw clinically. Treatments are generally classified as conservative and aggressive. Conservative treatment includes simple enucleation, with or without curettage, or marsupialization. Aggressive treatment generally includes peripheral ostectomy, chemical curettage with Carnoy’s solution, cryotherapy or electrocautery and resection.

**Case:** In this study we present the treatments of three cases with large parakeratinized odontogenic keratocysts. First case is a 56-year-old male patient with a painful swelling, second case is a 17-year-old male patient without any complain and the third case is 62-year-old male patient with expansion in vestibular compact bone.

**Conclusion:** If the treatment is made by marsupialization (as in our first case) follow up periods become very significant.

**P786**

**Effect of Local Anesthesia on Trigeminal Somatosensory-Evoked Magnetic Fields**

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**Objectives:** Inferior alveolar nerve injuries are associated with a high incidence of dental treatment such a lower third molar extraction, dental implant placement, orthognathic surgery etc. However, objective assessment of inferior alveolar nerve injuries is absolutely imperative for knowing severity of impairment and prognosis. The aim of this study was to evaluate the severity of inferior alveolar nerve injuries via focus on brain activity of somatosensory cortex.

**Methods:** Ten healthy volunteers participated in this study. We have made temporally inferior alveolar nerve paralysis by injecting a local anesthetic to unilateral mental foramen. Using magnetoencephalography (MEG), we examined for cortical responses to somatosensory evoked field (SEF) from the lower lip both anesthetic and unaffected side in each subject.

**Results:** On the unaffected side, the SEF was observed within the primary somatosensory cortex (SI). The peak latency was about 20 ms at stimulus side. In contrast, on the anesthetic side, the SEF was not observed within the SI.

**Conclusions:** These results suggest that we can assess the inferior alveolar nerve injuries objectively by using an MEG.

**P787**

**Management of Denti Gerous Cyst at Patience with Mix Dentification- Case Report**

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Denti gerous cysts is a bone lesion that develops adjacent of unerupted or impacted developed tooth crown, which sacus is attached on the cervical part of the tooth. At children with mix dentition this kind of pathology is common adjacent of mandibulary premolars. There are different treatments of deni gerous cyst.

**Aim:** In this case report is presented spontaneous eruption of second mandibular premolar after removal of cystic lesion at the boy of 9 years old, despite the dislocation of the involved tooth until the bases of the mandibula.

**Treatment:** Under local anesthesia a cystic sacus has been removed, while conserving the involved tooth. With jodophorn gaze wound kept open. Hystopathologic analisys has confirmed the diagnose: Denti gerous cysts. Eruption of tooth and bone regeneration has been monitored with periodic radiography and after 16 months
mandibulillary second premolar has erupted completely in the dental arch, without orthodontic traction.

**Conclusion:** Removal of Dentigerous cysts while conserving the involved tooth allows the spontaneous eruption, even when tooth is deeply dislocated. This modality of treatment of dentigerous cysts with mixed dentition is very advantageous and ethical because it saves vital structures and allows tooth eruption.

**P788**

Incidents of Dry Socket during the Post War Period in Kosova

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**Background:** Dry socket is a postoperative complication that occurs after dental extraction and has been defined as an inflammation of the alveolus.

**Aim:** The objective of this study was to determine the prevalence, and risk factors of dry socket that occurred during period after war period 1999–2004 in Kosova.

**Methods and materials:** The evidence that is held in the UCCK, Department of Oral Surgery in Prishtina has been analyzed throughout the postwar period to determine the frequency of dry socket;

We analyzed: (i) the percentage of dry socket from the number of all extractions (ii) the percentage of dry socket after extraction of the third molar (iii) the distribution of these two rates by gender and age.

**Results:** During 1999–2004 were registered 16,297 dental extraction. The average for dry socket in this period was 0.85%. From 201 cases of dry socket, 62.2% were female, while 37.8% male. There was significant difference by sex (Chitesti = 11.95, p < 0.01), therefore we can conclude that dry socket was more frequent in females than in males. The largest number of patients with dry socket were 20–29 years age, 42.8% of all cases. In our clinical from 201 cases, 4% dry socket were dry socket of the mandibular third molar teeth of third maxillary molar. With Chi test we have significant statistical correlation (p < 0.05).

**Conclusion:** Based on these results the average for dry socket in this period was 0.85%, therefore we can conclude that dry socket is in normal margins compared the literature.

**P789**

Case Reports of Two Unusual Tonsiloliths with CBCT Findings

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**Introduction:** Tonsiloliths are precipitation of calcium salts in tonsillar crypts that are packed with bacterial and organic debris. They are seen single, multiple, unilateral or bilateral. Using the CBCT two cases of unilateral tonsiloliths detected as bilateral tonsiloliths on panoramic image is presented this report.

**Case-1:** A 38 year-old woman was referred to our clinic complaint of mild moderate pain of left mandible. A panoramic radiology findings revealed that bilateral slight radiopaque image located on the right and left in the midst of ramus mandible. A CBCT scan was taken to determine exact anatomical location of radiopaque lesion. There was a 5.6- 4.2- 4.2 mm diameter hiperdens calcified mass in the left tonsile region. Our diagnosis is a tonsilolith for this case according to history of the patient and CBCT images.

**Case-2:** A 26 year-old woman was referred to our clinic complaint of slightly pain of mandible. A panoramic radiography findings revealed that bilateral radiopaque image located on the right and left ramus mandible. A CBCT scan was taken to determine exact anatomical location of radiopaque lesion. There was a 6.6- 4.1- 5.4 mm diameter hiperdens calcified mass in the left tonsile region. Our diagnosis is a tonsilolith for this case according to history of the patient and CBCT images.

**Conclusion:** Cone-beam computed tomography is a great diagnostic tool for to detect and to differentiate superimposition images from actual calcifications of tonsils.

**P790**

Paranasal Sinuses Abnormalities on Cone-Beam Computed Tomography

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**Aim:** The aim of this study was to investigate paranasal sinus abnormalities detected on cone-beam computed tomography (CBCT) in an adult population.

**Materials and methods:** Three hundred fifty-three consecutive CBCT scans that were obtained at Suleyman Demirel University, Faculty of Dentistry, Dentomaxillofacial Radiology Department between November 2011 and April 2013 were retrospectively inspected for abnormalities in the paranasal sinuses by three observers. Examinations of categorical parameters according to prevalence’s were analyzed using descriptive statistics, chi-square tests.

**Results:** The age of patients ranged from 18 to 85 years old (mean 41.27 ± 16.76). There were 172 (48.7%) female and 181 (51.3%) male. Muscosal thickening, mucous retention cyst, sinusitis, antrolith, oronasal fistula, periostitis, foreign body, tooth, odontogenic cysts, tumours, osteoma and hypoplasia were observed. The most frequent abnormality was mucosal thickening in maxillary (48.7%), sphenoid (14.7%) and ethmoid (73.4%) sinuses.

**Conclusions:** Cone-beam computed tomography is a preferable imaging method for evaluation of paranasal sinuses. Dentomaxillofacial radiologists should examine the whole volume of CBCT images not to miss paranasal sinus abnormalities.
A 46-year-old woman presented with a swelling in the anterior maxilla. Clinical examination revealed a swelling in the right anterior maxilla. Panoramic radiography revealed a well-defined radiolucent lesion involving permanent central and lateral teeth germs, extending from midline to the primary canine and nasal floor. A diagnosis of CGCG was made with incisional biopsy. In this case, intralesional steroid injection was performed in the lesion for 6 weeks under sedation because of patient’s age and localization of the lesion. Therefore the treatment was failed; enucleation of the lesion was performed under general anesthesia. During the surgery, permanent teeth germs were preserved. Conclusion: The patient’s follow-up continues for 7 year and no recurrence has seen, her teeth erupted in normal position.

Enamel Demineralization Following Orthodontic Treatment
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Aim: The aim of this study was to evaluate the in vitro effects of a fluoride topical agent in reducing enamel demineralization around orthodontic braces.

Materials and methods: On a 40 teeth sample (premolars) extracted for orthodontic reasons, brackets were bonded with Fuji Ortho LC. The teeth were divided into two groups of 20 teeth (experimental and control). The first, experimental group included the tooth samples that were treated with Fluorogal (0.05% F), every day for 1 min in the period of 6 months. The teeth were stored in artificial saliva for a period of 6 months. After that, the samples were prepared with the sputter technique in vacuum evaporator, for a SEM analysis (JEOL JSM 5300).

Results: The results showed that the prevention of dental caries is highest with passing the daily low dose of fluoride, which leads to a small but significant increase of strengthening the concentration of fluoride in the oral cavity. Examination of enamel surfaces adjacent to orthodontic brackets revealed calcium fluoride-like material (CaF2) deposition as a reaction product of topical fluoride application.

Conclusion: Topical application of fluoride on enamel adjacent to orthodontic accessories, incorporated as a routine clinical preventive procedure, is a simple measure of great significance. It is strongly recommended for decreasing the risk of enamel demineralization during orthodontic treatment.
Aim: To evaluate possible different salivary parameters in whole saliva such as flow rate, salivary pH, the concentrations of calcium, phosphate and total protein in caries-free children and caries active children which were characterized by ICDAS II index.

Materials and methods: The Research Human Ethics Board of Western University was approved for 10 caries-free and 8 caries-active subjects. After measuring the salivary flow rate and salivary pH, calcium determination was carried out with QuantiChrom-TM Calcium Assay Kit, (BioAssay Systems, Hayward, CA, USA). Phosphate determination was performed by Gee-Deitz method. Bicinchoninic acid protein assay kit (Pierce Chemical, Rockford, IL, USA) was used to determine the total protein concentration.

Results: The breast feeding period of 18 children (46.8 ± 9.5 months) were not found statistically significant on the presence of active lesions. However, the frequency of teeth brushing (p = 0.034) and daily snacks (p = 0.04) were statistically significant. The average of saliva flow rates and mean pH values were found 0.359 ± 0.20(ml/min), 7.15 ± 0.15 in caries-free group and 0.455 ± 0.24(ml/min), 7.035 ± 0.38 in caries-active group respectively. The slight differences on the concentrations of Ca, phosphate and total protein in caries free children compared to caries active children were not found statistically significant (p ≥ 0.05). On the other hand, an increase in the salivary flow rate was observed among both the groups with a decreased protein concentration indicating an inverse relationship due to protein dilution levels in saliva.

Conclusion: At this time, we are attempting to establish a standard baseline of whole saliva for future studies. Further studies on salivary research need to be effected to understand and compare biological characteristics in children population.

P795
Effect of CPP/ACP and Fluoride on Inhibition of Enamel Demineralization
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Aim: To evaluate the effect of casein phosphopeptid amorphous calcium phosphate (CPP/ACP) containing tooth-mousse and fluoride containing mouth-rinse as a prophylactic measure to inhibit enamel demineralization during fixed orthodontic treatment by evaluating with laser fluorescence in vivo.

Materials and methods: Thirty volunteers (aged 14–22) planned for fixed orthodontic treatment without any skeletal disorders were recruited for this investigator-blinded in vivo study. Subjects planned for fixed orthodontic treatment with no active caries were randomly assigned to three groups including CPP/ACP containing tooth mousse (3 min/day), fluoride containing mouth-rinse application (twice a day) and a control group without any additional application. All participants were instructed to use standard fluoride toothpaste (1450 ppm NaF) and informed about their basic oral hygiene routines. Buccal bracket-bonded enamel surfaces were measured by laser fluorescence device (DIAGNOdent; Kavo) by two calibrated independent examiners at the baseline, 3, 6, 12 months and after 24 months. LF changes between the groups were analyzed by Friedman Variance Analysis Test while Kruskal Wallis test revealed the changes due to time intervals.

Results: Statistically significant LF changes were found within all the time periods (p < 0.001) while CPP/ACP containing tooth-mousse exhibited the most inhibitory effect against enamel demineralization with significantly less LF reading values (p < 0.001) when compared to fluoride mouth rinse. CPP/ACP containing tooth-mousse seemed more efficient than fluoride containing mouth rinse however both of them are recommended to inhibit possible enamel demineralization during orthodontic treatment.

P796
The Antibacterial Effect of Oral Mouth Washes on Streptococcus mutans Species
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Introduction: Streptococcus mutans is the species with the biggest cariogenic potential. There are many commercially available oral antiseptics that are recommended as a supplement in the prevention of caries and periodontitis. They contain different substances that have an antimicrobial effect. The choice of antiseptic is often a problem for both patient and therapist.

Aim: The aim of this study is to determine effect of some mouthwashes on cariogenic bacterial species S. mutans.

Materials and methods: The testing was done using diffuse technique. The S. mutans strains used was isolated from saliva on TYC-SB agar in anaerobic conditions. The obtained bacteria were inoculated on TYC-SB agar and disks of filter paper soaked with mouthwashes were placed on that surface. Twelve independent measures were done for each mouthwash. After 48 h of incubation on 37°C in anaerobic conditions, the diameter of the growth inhibition zone of bacterial colonies was measured. The values used for comparison were the mean values with one standard deviation. The homogeneity of the results was confirmed by calculating the coefficient of variation.

Results: The coefficient of variation of the diameters showed that all results were homogenous. The mean values of the diameter of of the growth inhibition zones for different mouthwashes were the following: Curasept 220° (14.41 ± 0.02), PerioAid 0.12° (13.42 ± 0.02), Lacalut° (11 ± 0.01), Vitiss° (7.83 ± 0.08), Colgate Plax° (7.58 ± 0.03), Active oxygen° and Gengigel° (0).

Conclusion: This study showed that Curasept has the greatest anti-cariogenic potential and that active oxygen and Gengigel had no antibacterial effect on the cariogenic species S. mutans.
P797
Periodontal Health Status, Dental Caries and Risk Habits among Malaysian Indigenous Group
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Aim: To evaluate the common risk habits among Malaysian indigenous group (so called “orang asli”) with the prevalence of periodontal diseases and dental caries in a few settlements in Malaysia.

Materials and methods: The study population comprised of 378 indigenous subjects residing in a few settlements in states of Pahang and Johor, Malaysia. Data were collected through an oral examination and a questionnaire interview. Periodontal status was assessed using Community Periodontal Index (CPI) and DMFT were noted according to WHO recommendation. Information on sociodemographic, betel quid chewing and smoking habits were obtained.

Results: Most of the orang asli had periodontal problem with 42.1% had gingivitis and 32.9% had periodontitis. Among them only 5% had healthy periodontal status. The mean DMFT was 8.61 with mean decay (DT), Missing (MT) and filled (FT) were 3.53, 4.06 and 1.01 respectively. The main risk habits practiced by them are betel quid chewing and smoking. 14.3% of them were chewing betel quid and smoking, while 13.0% and 20.2% were either had betel quid or smoking respectively.

Conclusion: The prevalence of periodontal problems was relatively very high as compared to the prevalence of the decay. Practicing risk habits such as betel quid chewing and smoking are the main contributors for the poor periodontal health.

P798
Tracking Investigation of Dental Caries among 156 3 Years Old Children in Shanghai Suburb for 3 Years
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Objective: To investigate the incidence trend and feature of dental caries among 3 years old children in Jiading district, and to provide the first hand data for the prevention and treatment of caries.

Methods: Longitudinal study was used, and 156 3 years old children were investigated for 3 years, randomly selected from a preschool in Jiading District meanwhile, question-and-answer survey based on paper were also used for their parents. SPSS 14.0 software package was used for statistical analysis.

Results: The annually prevalence of dental caries among the subjects were 61.54%, 70.51%, 75.64%, while dmft were 2.99, 3.81, 4.51. The prevalence of dental caries and dmft increased with the ages increasing. There was significant difference in prevalence of dental caries and also in dmft every year (p < 0.05). There was no significant difference between boys and girls (p > 0.05). The investigation showed that with more times of daily teeth brushing, the prevalence of dental caries decreased significantly.

Conclusions: The dental caries among the children in Jiading District were serious, and the prevalence of dental caries increased with the growing ages. It was indicated that more prevention and treatment for dental caries should be strengthened.

P799
Dental Trauma and Mouthguard Usage among Soccer Players in Izmir, Turkey
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Aim: The risk of athletes getting dental injuries while playing sports is very high and can be minimized by the use of mouthguards. The aim of this study was to determine the occurrence of dental injuries and the level of knowledge about dental trauma and mouthguards in professional Turkish soccer players.

Materials and methods: The present study is based on data obtained from personal and direct interviews through questionnaires concerning the question of dental trauma and the usage of mouthguards answered by 343 professional soccer players with an average age of 15.11 ± 1.9 years.

Results: Among the respondents, 10.2% of the players reported the occurrence of some type of dental injury while training, including avulsions (5.7%) and dental fractures (80%) being the most prevalent. After dental trauma, only two players were treated immediately. When the players were questioned about tooth avulsion, 18.4% answered that replantation of the avulsed tooth is possible and 20.1% said that it is possible to obtain success if the replantation is done immediately after the trauma. Regarding mouthguard use, a total of 212 players (61.8%) did not know about mouthguards and only one (0.3%) reported using a mouthguard. Among the players, 31.5% responded that a mouthguard was not necessary. In addition, dental staff are not a part of teams’ medical and health staff. It was possible to conclude that dental injuries are common during professional soccer trainings and there is a lack of information amongst players with regards to mouthguards and prevention of dental trauma.

P800
Dental Status Investigation of Identical Twins
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Dental genetics as a part of medical genetics is developing fast because of the fact that tissues and organs in maxillo- facial area are accessible, visible, it is easy to be measured and clinically and functionally investigated.

Aim: To study and compare the dental status of identical twins.
Materials and methods: Thirty pairs of identical twins at the age of 11–55 have been investigated at the Department of Operative Dentistry and Endodontics, Faculty of Dental Medicine, Medical University- Plovdiv, Bulgaria in the period April–December 2012. An original questionnaire with patients’ history and clinical observations has been filled in. Collected data is analyzed by statistical software SPSS 13.0.

Results: 56.6 percents of the investigated twins are males and 43.3 percents are females. The mean age of the group is 26.6 years. The average twins’ pair living together period is 20.8 years. Mean DMFT index for the first born twins is 40.9 and for the second born is 38.1. The average frequency of oral hygiene per day for the first group is 1.86 and for the second is 1.93.

Conclusions: The identical twins are not only a medical phenomenon. This study reveals the tight relationship between the genetic disposition and the dental status of the pairs. Further investigations in the context of dental medicine practice are needed.

P801
Students’ Reasons for Choosing Dentistry and Dental Students’ Views on Postgraduate Education
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Aim: Purpose of the study is researching dentistry students’ reason for choosing dentistry and the views on postgraduate education before and after determining dental expertise exam.

Materials and methods: Totally 364 students (Group 1; 2008–2009 years 162 students and Group 2; 2012–2013 years 202 students) questionnaire evaluated. Group 1–2 divided into two subgroups A and B according to clinical internship and determined opinions the reasons for choosing dentistry, questions about the area of expertise they prefer. Results of the questionnaires evaluated by t-test and chi-square test.

Results: Factors for choosing dentistry are as following: wish to helping people, professional reputation and high business warranty, adequate financial gain and between these factors are significantly different. However, the rate of who choose dentistry willingly (19.7%) was less as a result of university exam (38.7%). Compared to gender, boys trust their hand skills more than girls (p = 0.004), and they want to be independent in working environment (p = 0.001). Students of 40.6% preferred universities that near the place of residence. There is a significant ratio between the number of students who want to postgraduate education in Group-2 (89.1%) and the Group 1 (71.0%). Comparing the ratio of desire of postgraduate education Group 1A (83.3%) and Group 1B (60%) first one is higher, and for Group 2A (86.6%) and 2B (90.4%) this ratio is contrary.

Conclusion: Postgraduate education preferences is increased by the beginning of clinical internship and dental expertise exam. Consequently, dentistry is a trade section protects its reputation, highly preferred at graduate/postgraduate dental education.
The including criterias were: no caries, no enamel cracks and no previous chemical reactions.

The teeth were placed in 20 × 10 × 10 mm polymethylmetacrylic blocks (Meliodent, Heraeus Kulzer). The blocks were randomly divided into three equal groups and received the following treatments: Group I: Cleaned with pumice +37 orthophosphoric acid + bonding (3M Unitek Transbond XT); Group II: Proplylacetic paste (Sultan TOPEX) +37 orthophosphoric acid + bonding (3M Unitek Transbond XT); Group III: Gaseous ozone (Biozonix, Germany) application +37 orthophosphoric acid + bonding (3M Unitek Transbond XT).

All samples’s shear bond strengths were determined using an universal testing machine. An analysis of variance (ANOVA) was used to determine whether there were significant differences between the groups.

**Results:** Group III (ozone application before bonding) showed the highest bond strength. Group II showed less bond strength than Group III and higher than Group I.

**Conclusion:** According the results of this in-vitro study, it was shown that gaseous ozone application before bonding increases the bond strength of orthodontic brackets. It can be a better idea to apply gaseous ozone before bonding to prevent bracket loss during the orthodontic treatment.

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**P806 Effects of Casein Phosphopeptide Amorphous Calcium Phosphate (CPP-ACP) and Sodium Fluoride Mouth Rinse on Enamel Demineralization Adjacent to Elastomeric vs. Metal Ligated Brackets**

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**Aim:** To investigate the effects of casein phosphopeptide amorphous calcium phosphate (CPP-ACP) and sodium fluoride mouth rinse on enamel demineralization adjacent to fixed elastomeric or metal ligated orthodontic brackets using laser fluorescence in vivo.

**Materials and methods:** Twenty-four healthy adolescents (14–22 years) undergoing orthodontic treatment were randomly divided into two experimentals and a control group consisting of two subgroups each according to ligation type of the brackets. The control groups used only fluoride toothpaste (1400 ppm) for oral hygiene maintenance twice a day while the fluoride groups were instructed to use 0.005% sodium fluoride rinse and the
CPP-ACP groups to use GC tooth mousse once a day in addition to fluoride toothpaste. Measurements were performed from 4 selected sites around the brackets for each tooth by laser fluorescence device at baseline, 3, 6, 12 and 24 months from the baseline. The changes between the groups were analyzed by Friedman variance analysis test while Kruskal Wallis test revealed the changes due to time interval.

Results: There were no statistically significant intragroup differences with either ligation method compared with the baseline (p > 0.05). The CPP/ACP and fluoride rinse groups developed less laser fluorescence differences then the control groups (p < 0.01).

Conclusion: The use of CPP-ACP and fluoride rinse can be more beneficial than fluoride tooth paste alone for prevention of enamel decalcification adjacent to fixed orthodontic appliances. The type of ligation has no effect on the development of decalcification.

P807
The Relationship between Orthodontic Treatment Need and Dental Caries
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Aim: The aim of this study was to evaluate the relationship between orthodontic treatment need and dental caries in 11–14-year old children in İzmir/Turkey.

Materials and methods: A one hundred and sixty-five 11–14-year old children (105 female, 60 male) in İzmir were included in this study. One experienced orthodontist recorded the orthodontic treatment need by using dental aesthetic (DAI) and two experienced clinicians performed and decayed, missing, filled teeth (DMFT) indices. Spearman’s rank correlation coefficients were used to measure the association between variables.

Results: The mean of DAI score ± standard deviation was 24.24 ± 7.12. Although 66.7% of the children had DAI scores of Grade 1 (<26) which were classified as not requiring orthodontic treatment, 17% of the children had DAI scores of Grade 2 (between 26 and 30) indicating definite malocclusion and elective treatment. As a total 27 children need orthodontic treatment (14 of them Grade 3 and the others Grade 4). The mean and standard deviation of DMFT index was 2.2 ± 1.95. According to DMFT index, 29.1% of the children shown no caries risk, 46.7% had moderate caries risk and 24.2% had high caries risk. No significant correlation was observed between DAI and DMFT scores (r = 0.006, p < 0.939).

Conclusions: Within the limitation of this study, a correlation was not found between the severity of malocclusion and dental caries. Studies with larger sample are needed to investigate the relationship between orthodontic treatment need and dental caries for adolescents.

P808
The Evaluation of the Effects of Bionator Appliance on Airway Volume in Mandibular Retrognathia Patients with Computed Tomography
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Aim: The aim of the present study was to evaluate the effects of Bionator appliance on airway volume with CBCT.

Materials and methods: Our study has two groups. Bionator group (n = 10) and Airway control group (n = 10). All patients were Class II div 1 malocclusion with mandibular retrognathia and low angle growth pattern. Patients were at the peak pubertal growth period. CBCT images were taken at the start of study and after 6 months of appliance usage. No treatment is given to the airway control group. Intragroup differences were evaluated with SPSS 15.0 statistical analysis program.

Results: Statistically significant differences were found between Bionator and Control group. Airway volume was affected positively by Bionator treatment.

P809
The Orthodontic Approach to the Congenital Deficiency of Maxillary Lateral Incisor
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Introduction: Agenesis of lateral maxillary tooth, lack of wisdom tooth and lower incisor teeth are the most common congenital deficiencies. Lack of maxillary lateral tooth creates a serious aesthetic problem for the smile and also leads to psychological problems. In these cases, a multidisciplinary approach is necessary to provide an aesthetic and psychological solution. Those approaches often include orthodontic or prosthetic interventions. The first approach can be the mesialisation of the posterior group tooth for the fulfillment of the lateral tooth space. In this type of approach canine tooth is given lateral shape with the use of stripping. The second approach can be the use of lateral implants or bridges, but this approach would be much more prostetic solution.

Case: In this case report, a 17-year-old female patient with unilateral agenesis of upper lateral teeth is treated by the mesialization of posterior tooth group by the use of mini-screws. The duration for posterior mesialisation was 6 months and the total treatment time was 14 months. After the mesialisation of canine teeth for space closure, lateral form was given to the canine to provide an aesthetic result.

Conclusion: As a conclusion, mini-screw was successfully used for en masse mesialisation of posterior tooth.
P810
The Observation of Individuals’ Mandibular Volume with Ectodermal Dysplasia by Three Dimensional Computer Tomography Method
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Aim: In this research project, it is aimed to observe the mandibular volume of the ones with anhydrotic ectodermal dysplasia, by the three dimensional computer tomography method and to compare these findings with the normal individuals.

Materials and methods: The test group consists of seven people with the ectodermal dysplasia, and the control group consists of seven people with skeletal class I. Three dimensional computer tomography is taken from both the test group with the ectodermal dysplasia and the control group.

Results: At the end of the statistical analysis, which is applied among the metric measurements that are by using the method of three dimensional computer tomography, no difference is found in the dimensions of the mandibular volume of the ectodermal dysplasia compared to the control group.

P811
The Evaluation of Salivary Total Oxidant-Antioxidant Status and DNA Damage of Children Undergoing Fixed Orthodontic Therapy
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Aim: To determine the relationship among salivary levels of total oxidant status (TOS), total antioxidant status (TAS) and 8-Hydroxy-2’-deoxyguanosine (8-OHdG) of children undergoing fixed orthodontic therapy.

Materials and methods: Thirty healthy children (mean age 13.72 ± 1.7 years) were randomly divided into three groups of 10. For standardization, same brand brackets, tubes and arch wires (Dentaum, Germany) was used and attachments were bonded to all teeth in both arches using three different orthodontic light cure composites, Transbond XT (3M Unitek, USA), Kurasper F (Kuraray Europe, Germany) and GrenGloo (Ormco Corporation, USA). The level of salivary TOS, TAS and 8-OHdG were collected three times, before treatment (T1), 1 month (T2) and 3 months (T3) after appliance placement. All data were analyzed statistically using Wilcoxon and Kruskal-Wallis tests.

Results: There were no statistically significant differences in the salivary levels of TOS, TAS and 8-OHdG within same time periods among three different orthodontic composites (p > 0.05). The levels of TAS in all composite groups decreased over time. These decreases were found statistically significant in Kurasper F and GrenGloo at T1-T3 and T2-T3 time points (p < 0.05). The levels of 8-OHdG in all composite groups decreased between T1 and T2 (p < 0.05). However, the levels of 8-OHdG in all composite groups increased from T2 to T3. These differences of levels of 8-OHdG were statistically significant in Kurasper F and GrenGloo applied groups (p < 0.05).

Conclusions: Fixed orthodontic appliances bonded with tested composites did not increase cytotoxicity markers in saliva. Orthodontic treatment has no cytotoxic effect on children in evaluated time period.

P812
Interdisciplinary Treatment Correction of Previous Treatment Diagnose and Planning Mistakes and their Consequences-Case Report
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Aim or Purpose: The aim of this study is to show interdisciplinary treatment correction of previous treatment diagnose and planning mistakes and their consequences. Through this case we will show you our standing point and results acquired with adequate correction with fixed orthodontic treatment, conservative and fixed-prosthetic restorations (FPR).

Materials and methods: Patient, J.G. age 38 came in our clinic 2011, for quick correction of the consequences of mistaken previous treatment diagnoses and planning. After the clinical examination, anamnesis and radiographic analyses we established presence of hipodonta 12, 22 tooth, impaction of 23 tooth, early extraction of 33 tooth, extraction of lower posterior teeth, midline shift to the left, non satisfactory smile and aesthetics. The therapy plan consists of orthodontic fixed appliance in first phase, conservative restorations in second phase and prosthodontic treatment in third phase.

Results: The results obtained confirm that the main reason for the mistakes of diagnosis and treatment planning is wrong extraction of teeth. In 1 year period with fixed appliance, conservative reshape of 13 tooth and 24 tooth into lateral incisors, correction of linea mediana, dental bridges in lower posterior parts we have achieved satisfying results and aesthetics.

Conclusion: In our experience we can conclude that the protocol must be valued individually for each patient respecting patient’s desires and needs, detail analyses for each case with prediction of possible mistakes. Satisfying results and the satisfying smile of the patient are motivation for the therapeutic team for further interdisciplinary collaboration.

P813
Changes in Oropharyngeal Airway and Respiratory Function Following Class-III Bimaxillary Surgery
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Aim: To determine the relationship among salivary levels of total oxidant status (TOS), total antioxidant status (TAS) and 8-Hydroxy-2’-deoxyguanosine (8-OHdG) of children undergoing fixed orthodontic therapy.
Objective: To evaluate the cephalometric, oropharyngeal airway volume, respiratory function during sleep and pulmonary functions changes in a severe Class-III patient undergoing bimaxillary orthognathic surgery.

Method: A 19-year-old male patient referred for treatment with complaint inability to incise food and unesthetic profile. Cephalometric evaluation revealed a significant Class-III skeletal discrepancy (ANB = −15°) with a negative overjet of 17 mm. Maxilla was advanced 10 mm with LeFort-I downfracture, mandible was positioned back 13 mm with BSSO. Cephalometric analyses, pulmonary function tests (PFT), and a 1-night sleep study for full polysomnography (PSG) were performed before and repeated after 6 months to surgery. Simultaneously, volumetric measurements were performed with computed tomography (CT). CT scans were assessed and analyzed using Simplant (Materialise, Belgium) software. Pre- and postoperative pharyngeal airway volumes were compared.

Result: Maxillary advancement and mandibular setback revealed an occlusion with a Class I molar and canine relationship. The overbite and overjet relationships were ideal and facial esthetic appearance was improved as a result of the reduction in the lower third of the face height in accordance with cepholometry. The PSG, PFT and CT alterations indicated an enlargement in oropharyngeal volume, better airflow and improved sleep quality.

Conclusion: A large amount of mandibular setback might inhibit biological adaption and cause sleep-disordered breathing, and it might be better to consider maxillary advance that does not reduce the airway for patients with skeletal Class-III malocclusions. The patient gained an appropriate facial aesthetics and oral function using multidisciplinary approach.

P814
Treatment of Simple Orthodontic Malocclusion by Removable Appliances
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Case: In this case report, the treatment of two young individuals, who had simple orthodontic abnormalities and referred to our clinic, with removable appliances was presented. The first case was 20 and second was 17 years old. In intra-oral examination of the first case, it was observed that overjet was 1 mm, overbite was 3.5 mm and class I molar and canine dental relationship. On the upper jaw, 2.4 mm crowding and retruded upper two central teeth were detected. In intra-oral examination of the second case, Class I molar and canine dental relationship, malaligned upper left canine were observed. In the cephalometric evaluation of the two cases, vertical and sagittal values were found to be normal. In both cases, removable appliances, with labiolingual springs were planned for treatment. In the first case, after protrusion of upper central teeth with labiolingual springs, incisors were stripped and they were retracted by narrowing vestibule arch. In the second case, bite opening was provided by adding acrylic on the occlusal and posterior surface of plate to avoid contact of tooth with the lower teeth. By activating the spring beyond incisor, it was protruded.

Conclusion: Existing problems in both patients were treated successfully with a good patient compliance and simple appliances. In both patients, the results were quite satisfactory and stable.

Theme: Preventive Dentistry: Periodontology

P815
The Large Mutations and Aggressive Periodontitis in Identical Twins: A Case Report
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Aim: Periodontitis is a multifactorial disorder related to several susceptibility factors such as age, gender and genetic. In this report, twin male adolescent one of who had advanced periodontal disease (Twin A) and other had moderate aggressive periodontitis (Twin B) were compared to the view of genetical status.

Materials and methods: Genomic DNA was extracted from EDTA-anticoagulated peripheral blood samples of the patients by using QIA amp DNA Blood Kit according to manufacturer’s instruction. The Affymetrix® Cytogenetics Whole-Genome 2.7M Array in combination with the standard Affymetrix protocol was used to detect chromosome aberrations across the entire genome. In genome analysis of twin A, there were diffuse heterozygote (CN State 1) deletions in multiple chromosome sequences respectively; heterozygote duplication (CN State 3) in chromosome 8 sequences; homozygote duplications in X and Y chromosomes. Remarkable pericentromeric heterozygote (CN State 1) deletions in chromosome 9 sequences were observed. In genome analysis of twin B, there were diffuse heterozygote (CN State 1) deletions in multiple chromosome sequences respectively; heterozygote duplication (CN State 3) in chromosome 6., 8., 11. and 12. sequences; homozygote duplications in X and Y chromosomes. Remarkable pericentromeric heterozygote (CN State 1) deletions in chromosome 9 sequences were observed. The mutation in chromosome 21 sequences of both patient included metaphysic dysplasia together with autoimmune polyendocrinopathy syndrome gene.

Conclusion: Genetic status is a crucial factor influencing of systemic or host response related risk. Identification of genetic factors for aggressive periodontitis is important for preventing the development of periodontal destruction.

P816
The Effects of Ozone on the Local and Systemic IL-1β and IL-10 Levels in Ligature-Induced Periodontitis in Rats
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Aim: The aim of the present study was to evaluate the effect of ozone on alveolar bone loss in experimental periodontitis in a rat model.

Materials and methods: The study protocol were approved by the Animal Ethics Committee of Cumhuriyet University School of Medicine. Twenty-two male Wistar rats were used in this study.

- Non-ligated (NL) group (n = 6)
- Ligature-only (LO) group (n = 8)
- Ligature + Ozone (LOZ) group (n = 8)

The rats from LOZ and LO groups were placed ligature. In LOZ group, Ozone was applied by gingival probe at a rate of 60 s/each tooth twice a day. On the 15th day, all the animals were sacrificed and the blood samples were taken for serum ELISA analyses. After the mandibles were dissected, the vestibular gingival tissues were taken from each animal to use for the gingival cytokine analyses. The mandibles were defleshed and stained with 1% aqueous methylene blue. The alveolar bone height was measured under a stereomicroscope by recording the distance from the CEJ to the alveolar bone crest. For the histopathological evaluation, osteoclast number, osteoblastic activity and inflammatory cell infiltration were determined. Statistical analysis were performed using the Kruskal–Wallis test.

Results: While Ozone lowered the IL-1β levels, it dwelled the IL-10 levels. The mean alveolar bone loss was reduced by ozone. Furthermore, the number of osteoblasts was increased and the mean osteoclast number and inflammatory cell infiltrate were decreased.

Conclusion: It is probable that ozone may prevent the destruction of alveolar bone loss and gingival inflammation.

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P817

Oral Health-Related Quality of Life and Chronic Periodontitis
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Aim: To assess oral health-related quality of life using the Oral Impacts on Daily Performance (OIDP) questionnaire in patients with chronic periodontitis.

Materials and methods: Twenty-five patients (13 females, mean age 40.5 ± 6.5) with chronic periodontitis and 25 periodontally healthy controls (12 females, mean age 37.4 ± 5.3) were recruited. All patients underwent a comprehensive periodontal examination and completed self-administered Bosnian version of the OIDP questionnaire. Data analysis used Chi square and Mann-Whitney tests.

Results: A total of 96% patients with chronic periodontitis and 88% periodontally healthy patients confirmed at least one impact in the last 6 months. The periodontitis patients OIDP score was significantly higher than that of healthy controls (16.6 ± 11.1 vs. 6.6 ± 4.8, p < 0.001). Oral impacts on speaking, smiling, going out and enjoying the contact of other people were significantly higher in patients with chronic periodontitis.

Conclusion: This study has identified that patient with chronic periodontitis report significantly poorer oral health-related quality of life than periodontally healthy patients.

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P818

Gingival Recession Caused by Lip Piercing: Case Report
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Aim: Gingival recession is the exposure of root surfaces due to apical migration of the gingival tissue margins. Lip piercing is a very rare agent that may produce mechanical trauma to oral tissues and that might be associated with gingival recessions. Two cases with gingival recessions caused by lip piercing in mandibular central incisors were presented.

Case: Two female patients aged 20 and 22 were referred to periodontology department with the complaint of gingival recession in mandibular central incisors. The patients had undergone lip piercing 6 and 9 months earlier. No abrasion on root surface was observed. Piercings seemed to be the main causative agent of the gingival recessions. The patients were advised to remove piercing, however, it was not accepted by both patients. For this reason no attempt was done to cover defects surgically.

Conclusion: The use of lip piercings may be associated with the occurrence of gingival recession in the anterior mandibular region. Dentists should be aware of the increasing number of patients with piercing and to provide appropriate guidance to patients for potential side effects.

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P819

Rheumatoid Arthritis as a contributing factor of Marginal Periodontitis
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Introduction: Rheumatoid Arthritis (RA) and Marginal Periodontitis (MP) are both inflammatory disease symptoms but with different etiology. Clinical studies have shown a possible interrelation between these two diseases, but neither clinical aspects or common pathogenic mechanisms are not yet known.

Materials and methods: The study participants consisted of 28 patients divided in MP group – patients with Marginal Periodontitis and MP+RA group – patients with Marginal Periodontitis and Rheumatoid Arthritis. Were recorded BOP and CAL and have been achieved statistic tests for comparison the obtained data and their correlation.

Results: Clinical data showed a higher number of periodontal affected teeth in the MP-RA group likewise the increased severity of periodontal injuries in this group.

Conclusion: These results suggest the need to extend the clinical studies on a higher number of patients and conducting basic
research to support the interrelation Marginal Periodontitis- Rheumatoid Arthritis.

**P820**

**Efficacy of Diode Laser as an Adjunct to Non-surgical Treatment of Chronic Periodontitis**  
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**Aim:** Periodontitis is a chronic inflammatory disease that affects the supporting structures of teeth, resulting in tooth loss. Smoking increases the level of free radicals in periodontal tissues, which in turn may be responsible for the destruction seen in periodontal diseases. Low-level laser therapy (LLLT) is recommended for its pain-reducing, wound healing promoter and anti-inflammatory effects. The aim of this study is to evaluate the effect of LLLT as an adjunct to non-surgical periodontal therapy of smoking and non-smoking patients with chronic periodontitis.

**Materials and methods:** The study group comprised 30 patients (15 smokers and 15 nonsmokers) (16 men and 14 women) with a mean age of 38.7 ± 5.5 years (range 22–58 years) with chronic periodontitis. Laser therapy was performed four times to the LLLT group by a clinician, on the baseline, first, second, and third weeks after treatment.

PD, CAL, GI, PI, and BOP were measured. Gingival crevicular fluid (GCF) was collected for assay of Total Oxidant Status (TOS) and Total Antioxidant Status (TAS) levels at baseline and 6 weeks.

**Results:** A significant decrease in clinical parameters were observed in both groups at 6 week, with a further decrease in the LLLT groups. LLLT groups showed a greater reduction of TOS in GCF, and increased of TAS in GCF at 6 week than the control sites.

**Conclusion:** The present study showed that associated therapy was suitable for non-surgical periodontal treatment. Furthermore, the results suggest that a LLLT could be a beneficial adjunct to non-surgical treatment of chronic periodontitis.

**P821**

**Expression of MMP9/NGAL in Gingival Crevicular Fluid during Orthodontic Movements**  
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**Objectives:** In the present study the aim was to measure the levels of Lipocalin (MMP9/NGAL) in gingival crevicular fluid (GCF) at different time points of orthodontic treatment.

**Materials and methods:** Gingival crevicular fluid samples were collected from 19 young orthodontic patients with maxillary fixed orthodontic appliances. Samples were gathered from a test tooth and also from a control tooth. As a test tooth was chosen a maxillary canine on which was applied an orthodontic force and as control tooth was chosen an orthodontic free mandibular canine.

**Results:** MMP9/NGAL increased from 1 h before activation of orthodontic appliance to a maximum at 72 h, returning to the level before the appliance of the orthodontic force after a week.

**Conclusions:** The results show a change in time of MMP9/NGAL levels in GCF of patients with orthodontic treatment. To establish the role of MMP9/NGAL in the cascade of mediators during orthodontic movements, require extensive studies that can determine the relationship between the marker and other substances in GCF.

**P822**

**Surgical Approaching of Endodontics Failure Teeth**  
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**Aim:** The aim of this study is to analyze the difference of success by retreatment with orthograde and retrograde filling method of endodontically failure teeth.

**Materials and methods:** In a period from 2010 to 2011 year were surgically treated 48 patients (27 males and 17 females) in age from 11 to 68 years old. Forty eight surgically treated teeth with periapical lesions were divided into two groups. First group (control group) was compound from 24 teeth with periapical lesions filled by orthograde way. Second group (study group) was also compound from 24 teeth with periapical lesions filled by retrograde way, because they have intra radicular restorations or metal ceramic crowns.

**Results:** After 12 months, bay all patients was made X-ray control, and by first group (control group) were evaluated eight cases with complete healing, 10 cases with unfinished healing, four cases with suspect healing, and two failure cases. By second group (study group) were evaluated 14 cases with complete healing, six cases with unfinished healing, four cases with suspect healing. Concerning the postoperative healing of lesions, by X-ray controle there was no statistically significant difference between two groups after 12 months (p = 0.59).

**Conclusions:** From this study, we can conclude that application of a retrograde filling with surgical intervention-apicectomy, could be considered like a minimal invasive procedure, which has positive effect by postoperative clinic results.

**P823**

**Comparative Analyze of Variables of Metal Ceramic Dental Bridges**  
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**Aim:** Our aim in this study is to:
1. Analyze the odontometric values of pontic elements of occluso-cervical, mesio-distal and vestibulo-oral dimensions:
2. Compare the getting values with homologous values of natural teeth.
3. Determine the difference in per cent of values from our study with values of control group.

**Materials and methods:** During 2010 and 2011 year, clinically were analysed and measured 455 pontic elements of lateral dental bridges by 151 treated patients from both sex, and in age from 26 to 70 years old. Measurement was made with an instrument for precise measuring (shubler), with precision of 0.1 mm. Like control group were used results from measurement of natural teeth according authors: Lavelle, Lenhossek, Sicher-Tandler and De Yonge-Cohen, realised with same measured precision of variables from 0.1 mm. The statistically significance of results from our study is showed with T-test ($t = 6.75$), and coefficient of probability ($p < 0.01$).

**Results:** The getting results showed that: Pontic elements in our study are in average for: $-23.49\%$ highest than control group $-16.13\%$ shorter than control group and $-8.82\%$ narrower than control group teeth.

**Conclusions:** Like conclusion we can say that:
1. The highest of pontic elements of dental bridge increase the resistance and the hardness of bridge with geometric progress.
2. The shorter pontic elements in mesio-distal dimension will influence on defence of dental bridge from deformity and breaking.
3. The narrower pontic elements will increase the hardness of dental bridge in linear manner.

**Theme: Preventive Dentistry: Public Health**

**P824**

**Masticatory Function and Obesity: A Review**

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**Aim:** It is already known that masticatory function has an impact on nutrition. Abnormal eating behaviors, such as avoiding hard food, high intake of soft fatty or palatable food, compulsive overeating, eating fast and chewing less are observed in obese subjects. This review aim is to known if there is an alteration of masticatory function in obesity.

**Materials and methods:** A research in the PubMed and ScienceDirect databases was performed, with the terms “masticatory function” and “obesity” from 2000 to present.

**Results:** From the research we retrieved 82 papers, from them we select 10 papers according to the purpose of the review.

**Conclusions:** Actually a very few information are available about masticatory function in obesity. Although there was evidence that a reduced masticatory function can induce nutritional disorders, such as gastrointestinal dysfunctional, in obesity the papers are contradictory, some reported that masticatory function was reduced, others that there is no change in masticatory function. In the actual issue, so as obesity, it is very important to improve our knowledge in this field, a lack of evidence is still present, more randomized trials are needed.

**P825**

**Relationship between the Type of Employment and the Edentulousness of Sri Lankan Women**

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**Aim:** Principal aim of this study is to find out the relationship between the type of employment and edentulousness of Sri Lankan women.

**Materials and methods:** A sample of 515 partial and complete edentulous women between 35–55 years of age was selected. They were examined and the general oral health status and missing teeth were recorded. They were given a questioner to find out the Educational standard, employment, income level, number of children and the amount of time available for health related matters. Reasons for extraction of teeth and awareness about the availability of alternative treatments were also recorded.

**Results:** Out of the total of 515, there were 152 house wives, 137 laborers, 89 teaches, 62 clerical staff, 51 medical personals and 24 other employments. There were 21 complete edentulous, 62 more than 15 teeth missing, 77 more than 10 teeth missing, 210 more than 5 teeth missing and 145 more than 1 tooth missing. A large majority (73%) out of the 83 subjects who had more than 15 teeth missing (including complete edentulous) were House wives and laborers. Unavailability of time despite of being aware of the alternative treatment seems to be the main reason for extractions.

**Conclusions:** Laborers who work on daily paid basis and house wives who are largely loaded with work at home and looking after children have the highest rate of complete and partial edentulousness in Sri Lankan women.

**P826**

**Evaluation of the Oral Health Data From 6 Elementary Schools**

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**Introduction:** Tooth decay is one of the most common diseases. In order to control this widespread problem, we have to increase consciousness of the protective methods and provide the most appropriate treatment. Oral health problems and tooth decays are especially common among children.

**Purpose:** To evaluate the oral health data obtained in the examination conducted in six elementary schools in Istanbul, in 2011.

**Materials and methods:** In 2011, the students in six elementary schools, in six counties of Istanbul received a general health
examination from the mobile health personnel of Istanbul Metropolitan Municipality Health Corporation. (General practitioners and nurses) This examination included all the students in the Kindergarten, special education and first through eighth grade. The results were electronically recorded.

**Findings:** The number of participants was 11,943. Tooth decays were recorded in 49.1% of the examinees (n. 5866), and different oral health problems were recorded in 0.2% (n.30) including bleeding in gums, dental filling, purulence, blacking and tartar. No oral health problems were observed in 50% of the examinees (n. 6047).

**Results:** Oral health problems were recorded in 49.3% of the 11943 students who were examined, 49.1% of which was tooth decays. The parents of the students with oral problems were informed and encouraged for treatment. As a result of this research, oral health educations provided by Istanbul Metropolitan Municipality Women and Family Health Protection and Education Department became more frequent, in order to increase the consciousness of oral health protection among students and to develop positive behaviour.

**P827**

Efficacy of Education on Infant Oral Health Care For Parents
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**Aim:** The aim of this study is to evaluate the efficacy of infant oral health education programme using a pre-post questionnaire for parents attending at the pediatric clinic of children’s hospital.

**Methods:** Fifty parents (father or mother) who had a baby aged 0–12 months, appointed at the well baby clinic in Dr. Behçet Uz Children’s Hospital participated in the study. This study was approved by the local ethics committee of the hospital. Parents completed a questionnaire immediately before and after a 30 min education programme performed as a PowerPoint presentation. The education programme was developed by using the AAPD (American Academy of Pediatric Dentistry) guidelines. The differences in pre and post questionnaires were evaluated. Paired t-test, McNemar, Wilcoxon tests were used for statistical analyses.

**Results:** A lack of knowledge about infant oral health care was found regarding the proportion of “incorrect” (%25) responses and “I don’t know” (%23) responses to the questionnaire before education. Statistically significant increase (%53) was determined in “correct” responses of the questionnaire between “before” and “after” education (p < 0.01, t = −14.423).

**Conclusion:** Results of this study indicated that education improved the oral health knowledge of parents caring for their infants and provided anticipatory guidance. Widespread application of education programme is suggested for establishment of dental home care.

**P828**

The Prevalence of Caries in Preschool Children Expressed by Dmft-Index
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**Introduction:** Dental caries in preschool children represents health and social problem, especially when the treatment rate is very low.

**Aim:** The purpose of the study is to determine the prevalence of caries among preschool children, expressed by dmft-index.

**Methods:** In study are involved 478 preschool children of 3–6 age. Preschool children were examined at various kindergartens in Pristina (capital of Kosovo) in period 17.10.2012–14.02.2013. This was a cross-sectional study conducted in randomly selected kindergartens. Dental caries was scored as the number of decayed, missing, or filled primary teeth (dmft), following the recommendations of the World Health Organization. Diagnostic criteria were calibrated, with an inter-examination reliability of kappa index.

**Results:** Prevalent of caries at the preschool children (dmft > 0), was 76%. Mean dmft was 5.97 ± 5.1. There was not significant differences between gender (p < 0.05). The prevalent ECC was 19% with dmft of 12.5. Structure of dmft-index shows that: carries teeth include 95%; missing teeth 1.3%; filling teeth 3.36%.

**Conclusion:** All data assessed at our preschool children, showed the very poor dental health status. Implementation of preventive measures at the earliest age, are necessary.

**P829**

Smile Healthy to Your Diabetes: Periodontal Disease at Diabetes Management
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**Aim:** To assess the correlation between diabetes management and periodontal disease among diabetic patients with diabetes type II (DM2).

**Materials and methods:** The present study is part of a prospective intervention study among DM2 patients (n = 186), Istanbul, Turkey. The data comes from the clinical baseline measurements: [Periodontal Clinical Attachment Loss (CAL), Community Periodontal Need Index (CPI), fasting blood glucose, HbA1c (glycated haemoglobin)]. Total sum of the highest scores for CAL at mesio-buccal (MB) and mid-buccal (MIDB) sites were taken separately for maxilla and mandible, in line with NHANES studies. Factor analysis and spearman rank correlation were applied.

**Results:** Mean CAL, for the whole mouth, at MB sites was 3.6 (± 1.8) and 3.7 (± 1.9) for MIDB. Participants having healthy gums for the whole mouth (CPlmax = 0) was 1.1% and 57% had at least bleeding in one sextant or more (CPlmax = 1 or 2). Patients with favourable HbA1c (HbA1C < 6.5%) had lower mean CAL at MB sites at the maxilla, mandible and the whole mouth compared to those with unfavourable HbA1c. Participants with unfavourable HbA1c were more likely to have periodontal pockets
(48%, CPImax = 3 or 4) compared to those with favourable HbA1c (24%), (p = 0.007). The two cluster found by Factor analysis; oral health (CAL and CPImax) and diabetes (Fasting Blood Glucose and HbA1C); were highly correlated with each other (rs = 0.83, p = 0.01).

Conclusion: Present findings highlight that periodontal disease contributes to diabetes; there is a need for integration of oral health to the diabetes management, in line with IDF and FDI declaration (2008).

P830
Oral Health Knowledge and Habits of Children under State Protection
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Aim: The aim of this study is to evaluate the level of oral health knowledge on causing and preventing of dental caries and bleeding gums and eating habits of children who were under state protection.

Materials and methods: Fifty-five girls that were living in “Society for the Protection of Children” in between the age of 12–19 were evaluated according to oral health knowledge and eating habits that were marked by the children on the questionare forms. All datas were statistically analysed by chi square test.

Results: 30.9% (n:17) of the children indicated that they haven’t gone to dentists previously. Twenty percent of them were afraid of dentists due to subjective experiences among people. 94.5% (n:52) knew that sugar and sweets can cause dental caries. 78.2% (n:43) were aware of brushing teeth can prevent caries. 63.6% (n:35) were thinking that irregular brushing teeth can cause gingiva bleeding. 98.2% (n:54) were brushing their teeth and 34.5% were brushing in the morning and evening regularly. 72.7% (n:40) were not using dental floss but on the contrary 50.9% (n:28) were using mouthwash. 65.5% (n:36) were not smoking. 52.7% of the children were not satisfied with the the apperance of their teeth. Six girls were stated that they were using antidepressant.

Conclusion: In this study, children who were under state protection know what causes dental caries and bleeding gums. However, oral hygiene habits should be improved.

P831
Electromyography Study during Dental Work in Sitting and Standing Position
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Background: Because of the narrow work area (the mouth), it is very hard for the dentist to find the optimal body posture during their work. Working posture is the highest risk factor for development of musculoskeletal disorders (MSD).

Aim: We studied electromyography (EMG) data during dental work in order to determine differences in muscular work load between standing and sitting position during dental work.

Materials and methods: Ten healthy, right-handed dentists, on postgraduates study were included in the EMG study. The recording electrodes were placed on the left and right sides of back: erector spinae (ES), shoulder: trapezius descendens (T), and neck muscles: sternocleidomastoideus (SCM) and splenius capitis (SC). During the measurements they performed typical dental examination in standing and sitting positions.

Results: Significant difference between muscle activity in two working posture was evident only in SC muscle groups on left (p = 0.032) as well right side of the body (p = 0.049), and in muscle activity of SCM muscle on the left side (p = 0.029).

Conclusions: Sitting is not always better than standing. In standing position, different muscle groups were used, than in sitting position during work. Etiology of MSD is multifactor and long sitting position in combination with static work can be one of the most important etiological factors for development of MSD. Dynamics working environment might be enabled by combining sitting and standing working posture.

P832
Assessment of the Impressive Factors in Treatment Anxiety
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Objective: The purpose of this study is to compare the patients’-living in two cities (A City-Van, B City: Konya) with different socio-cultural levels- anxiety level when they enrolled for different interventional treatments in individually and as a whole population. Intervention types, gender, medical and treatment backgrounds will be discussed as independent values.

Materials and methods: We conducted a survey of anxiety before the surgical treatments on 200 patients at the Department of Oral and Maxillofacial Surgery participated to the study. The State-Trait Anxiety Inventory (STAI) questionnaires were completed by patients while they were waiting for different interventional treatments at two cities. We evaluated the data with non-parametrical statistic method (Mann–Whitney U Test).

Results: According to the results of statistics, the level of State anxiety was statistically significant (p < 0.01) between two cities; however, it was not significant for the level of Trait anxiety (p > 0.05). Level of dental anxiety in A city was higher than B city. The difference of dental anxiety was found significant for the patients having a dental intervention before. Regardless of the cities they live, it was found that undergoing a psychological therapy, gender and the types of interventions (surgery or extraction) do not have any effect on the level of anxiety.

Conclusion: In conclusion, the socio-cultural difference is an important factor that affects the level of anxiety.
hand, it is found that having dental intervention before is a significant factor that increasing the treatment anxiety.

**P833**

**Effect of Protamine-Hydrolysate Peptides (DMX) in Oral Hygiene**

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Aim: The effect of protamine-hydrolysate peptides (DMX) on oral hygiene was evaluated.

Materials and methods: Eight individuals (mean age: 23.1 ± 1.2 years) and eight individuals (mean age: 41.6 ± 9.5 years) who had no systemic underlying disease and had not been medicated within the past 3 months were selected as the subjects for clinical study. Informed consent was obtained from all patients. DMX was administered 3 times a day during the 7-day treatment period. The correlation between different parameters, i.e. the coated area of the tongue, state of plaque attachment, and state of gingival inflammation, obtained before and after using DMX were compared. The coated area of the tongue was significantly reduced after DMX treatment (Wilcoxon signed-rank test, p < 0.05).

Result: The state of gingival inflammation also showed a significant improvement (paired Student’s t-test, p < 0.01). No significant difference was noted in the state of plaque attachment. Hydrogen sulfate was significantly reduced in breath odor in DMX group (paired Student’s t-test, p < 0.05).

Conclusion: Our results provide new information on DMX to maintain good oral hygiene and may thus aid in the understanding of oral environment.

**P834**

**Sickle Cell Disease: Strategy to Improve Oral Health in Brazil**

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Aim: Demonstrated training and information strategies for the promotion of oral health of people with Sickle cell disease (SCD). SCD is one of most common hereditary disease in the world and public health problem in Brazil.

Methods: A working group with experts in SCD and Oral Health had drafted a manual addressing: physiopathological and clinical aspects of SCD; oral manifestations in SCD; risk to oral disease of people with SCD; dental approach of people with SCD. The manual was used in the training of undergraduates, graduate students, teachers and technicians dental surgeons of the Single Health System (SUS). In addition, the use of “Manual of Health Education – Self-care in Sickle Cell Disease” as a tool in trainings such multi-professional skills.

Results: The training conducted between 2009–12 trained about 5500 health professionals over Brazilian territory; with a circulation of 30,000 copies per issue, the Handbook of dental health is in its third edition, also available electronically.

Conclusion: Sickle cell disease has as main need visibility in the country and qualification of the assistance. Multi-professional health care team, including oral health professionals, it is essential to reaching the goal proposed by the national policy of integral care for people with SCD which is to promote longevity with quality of life changing the natural history of SCD in Brazil.

**Theme: Dental Treatment & Restorative Dentistry: Endodontics**

**P835**

**Microtensile Bond Strength of Root Canal Dentin Treated With Three Different Adhesive Systems and Four Different Fiber-Reinforced Posts**

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Aim: Recently demand for esthetic restorations increased and non-metal esthetic posts have become popular, made of either high strength ceramics or reinforced resins such as carbon fiber-reinforced resin posts, glass fiber-reinforced resin posts, polyethylene fiber-reinforced posts. Important characteristics of fiber posts include a modulus of elasticity similar to that of dentin and their ability to be cemented using an adhesive technique. Clinically, there has been a wide range of reported failure percentages. Post loosening was reported in 16 of the 23 studies, making it the most commonly reported complication. It has been shown that failure of adhesively luted fiber posts often occurs due to debonding of the post. Many investigations have been conducted concerning improvement of the bond strengths between the post and the root canal dentin, including different pretreatment techniques of the post surface, pretreatment of root canal dentin, or use of different luting agents. Besides, post cementation into a root canal is still a concern, as confirmed by clinically observed failures. The purpose of this study was to evaluate the microtensile bond strength of three adhesive systems to root canal dentin restored with four adhesively luted fiber-reinforced post systems.

Methods: Thirty-six incisors were divided into four groups (n = 9). Four adhesively luted fiber-reinforced (glass fiber, quartz-glass fiber, zirconia-glass fiber and polyethylene fiber) post systems used in this study. Post spaces were prepared using drills corresponding to each group and each post was adhesively luted with one of three systems: a one-stage self-etch, a two-stage total-etch, and a three-stage total-etch adhesive. Three segments per root apical to the CEJ were obtained by sectioning the root under distilled water coolant with an Isomet saw (Buehler). The sections were 2.0 ± 0.1 mm thick. Each specimen was marked on its coronal
side with an indelible marker, and specimen thickness was measured with digital caliper with an accuracy of 0.001 mm. The sections (total = 108 sections) were stored individually in black film canisters with sterile water. To determine the bond strength, the bonding area of each specimen was calculated, and specimens were attached to a device to test microtensile strength at a crosshead speed of 1 mm/min. Data were analyzed using three-way analysis of variance and the Tukey test ($\alpha = 0.05$).

**Results:** Statically analysis showed no significant differences between the adhesive systems and fiberreinforced composite resin posts. Otherwise, significant differences were observed among root dentin regions ($p < 0.001$). Also, no interaction was significant. No cohesive fractures within resin cement, fiber-reinforced resin post, or root dentin were identified.

**Conclusions:** Adhesive systems tested demonstrated reliable bonding when used with fiber-reinforced resin posts.

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**Microleakage Study of an Experimental Restorative Material Through Radioisotopes**

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**Aim:** The purpose of this study was to evaluate the microleakage of the dental restorations using GCP Fill. The null hypothesis was that the type restorative system didn’t have influence in what concerns to microleakage.

**Methods:** Sixty noncarious extracted human molars were cut in two equal halves occlusogingivally and Class 5 cavities were prepared on the buccal or lingual surfaces of each tooth. The specimens were divided randomly in four groups. Two were restored with GCP Fill, while another was restored with FiltekTM Supreme (3M ESPE). The control group wasn’t restored. The specimens were stored in distilled water at 37°C for 7 days and after thermocycling 500 cycles between 5 and 55°C with a dwell time of 30 s. The specimens were submersed in a solution of 99mTc-Pertechnetate during 3 h, being the radioactivity then counted.

**Results:** In order to choose the adequate statistical test both group results were compared. There was not found homogeneity of variances and the Kruskal–Wallis test with multiple comparisons according to Bonferroni correction was chosen. Data analysis showed that there were statistically significant differences between experimental groups and control groups ($p < 0.05$).

**Conclusions:** Within the limitations of this study, it can be concluded that:

- The GCP Fill and the FiltekTM Supreme XTE do not differ in regard to microleakage.
- This technique proved to be simple, quick and fulfills the objective of a quantitative method in the evaluation of microleakage.

Long-term clinical studies need to be carried out to substantiate the results of this study.
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