

ISSN 0020-6539

IDJ

INTERNATIONAL
DENTAL JOURNAL

September 2013

Volume 63 Supplement I

Abstracts of the 101st
FDI Annual World Dental
Congress

WILEY
Blackwell



FDI Global Caries Initiative
"Leading the World to Optimal Oral Health"

fdi 
FDI World Dental Federation

Thursday, August 29, 2013

FREE COMMUNICATIONS SESSIONS 17–32

Free Communication Session 17 | B332 | 29.08.2013 |
09:00–11:00

Theme: Preventive Dentistry: Orthodontics

FC100

Antimicrobial Efficacy of *Salvadora persica* Extracts on Orthodontic Brackets

Hassan Suliman Halawany¹, Nimmi Biju Abraham², Yunus Mohammed Siddiqui¹, Hanan Abdulgafur Balto³, Vimal Jacob¹
¹Department of Periodontics and Community Dentistry, College of Dentistry, King Saud University, Riyadh, Saudi Arabia, ²Dental Caries Research Chair, College of Dentistry, King Saud University, Riyadh, Saudi Arabia, ³Division of Endodontics, Department of Restorative Dental Sciences, College of Dentistry, King Saud University, Riyadh, Saudi Arabia

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

Saima Nizar Hirji

Aga Khan University Hospital, Nairobi, Kenya

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.

FC102

Camouflage- A Viable Option for Treatment of Skeletal Class III Malocclusion

Vaishali Devidas Vadgaonkar¹, Girish Karandikar², Anita Karandikar³, Parag Gangurde¹, Rahul Hegde⁴, Varsha Rathod⁵, Rajesh Koppikar⁶, Arun Nayak¹, Manthan Patel¹, Aniket Gandhi¹, Nikhil Mahajan¹, Pallavi Shinde¹

¹Department of Orthodontics and Dentofacial Orthopaedics, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India, ²Department of Orthodontics and Dentofacial Orthopaedics, M.G.M. Dental College and Hospital, Navi Mumbai, India, ³Department of Orthodontics and Dentofacial Orthopaedics, Yerla Medical Trust Dental College and Hospital, Navi Mumbai, India, ⁴Department of Pedodontics and Preventive Dentistry, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India, ⁵Department of Periodontology, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India, ⁶Department of Periodontology, Bharati Vidyapeeth Deemed University Dental College and Hospital, Sangli, India

Treatment of Skeletal Class-III can be done by three modalities: Conservative, Camouflage and Surgical. In this paper we are describing Camouflage as a treatment modality for correction of Skeletal Class-III.

There are several advantages of camouflage treatment such as: it is Non-Surgical, Apprehension Free, Patient Friendly, Slow but Steady and economical. Decision for camouflage treatment depends mainly upon two main factors: Patient factors and Orthodontist factors.

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, co-operation 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 cases.

FC103

Comparison of Shear Bond Strength Between Waterlase Laser and Sandblasting Recycling Methods on Stainless Steel Orthodontic Brackets

Aida Nur Ashikin Abd Rahman¹, Faisal Ismail Bahnasi¹,
Mohamed Ibrahim Abu Hassan²

¹*Faculty of Dentistry, Centre of Studies in Paediatric Dentistry & Orthodontics, Universiti Teknologi MARA, Shah Alam, Malaysia,*
²*Faculty of Dentistry, Centre of Studies in Restorative Dentistry, Universiti Teknologi MARA, Shah Alam, Malaysia*

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 difference 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.

FC104

The Effect of Water Flow Rate Used for Laser Surface Treatment on Shear Bond Strength of Orthodontic Brackets

Tolga Topçuoğlu¹, Rıdvan Okşayan¹, Kadriye Ebru Ademci²,
Merve Göymen¹, Aslıhan Üşümez³

¹*Department of Orthodontics, Gaziantep University Dentistry Faculty, Gaziantep, Turkey,* ²*Department of Orthodontics, Bezm-i Alem University Dentistry Faculty, İstanbul, Turkey,* ³*Department of Prosthodontics, Bezm-i Alem University Dentistry Faculty, İstanbul, Turkey*

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 – $55 \pm 2^\circ\text{C}$ 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 standart deviations of the group 1, 2, 3 and 4 were $13,777 \pm 6581$, $12,1468 \pm 5439$, $13,289 \pm 2242$ and $13,945 \pm 4183$ MPa respectively. According to Kruskal–Wallis test no significant differences were found among the groups ($p \geq 0.05$). 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.

FC105

Dental Plaque Associated with Self-Ligating Brackets During Orthodontic Treatment

Saud A. Al Anezi

Department of Orthodontics, Bneid Al-Gar Sepcialty Dental Health, Ministry of Health, Kuwait

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

Atılım Akkurt¹, Mehmet Doğru¹, Mehmet İrfan Karadede¹, Arzum Güler Doğru², Veysi Akpolar³, Beyza Karadede⁴

¹Department of Orthodontics, Dicle University, Diyarbakır, Turkey, ²Department of Periodontology, Dicle University, Diyarbakır, Turkey, ³Department of Biophysics, Dicle University, Diyarbakır, Turkey, ⁴Department of Orthodontics, Yeditepe University, İstanbul, Turkey

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 Pillai'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 of present study, application of ELF-EMF was accelerated the orthodontic tooth movement on rats.

FC107

Disinfection of Thermoplastic Appliances

Atılım Akkurt¹, Mehmet Doğru¹, Arzum Güler Doğru², Nezahat Akpolar³, Mehmet İrfan Karadede¹

¹Department of Orthodontics, Dicle University, Diyarbakır, Turkey, ²Department of Periodontology, Dicle University, Diyarbakır, Turkey, ³Department of Microbiology, Dicle University, Diyarbakır, Turkey

Aim: The aim of this in-vitro study is to evaluate the efficiency of 0.12% chlorhexidine gluconate (CH) on the number of mutans

streptococci (MS) and lactobacilli (LB) on thermoplastic appliances.

Materials and methods: The material of this study is consisted of 58 sterilised thermoplastic appliances. Four groups ($n = 14$) were studied; in group 1 appliances were infected with MS and disinfected with CH, in group 2 appliances were infected with MS and disinfected with sterile tap water (STW), in group 3 appliances were infected with LB and disinfected with KH and in group 4 appliances were infected with LB and disinfected with STW. All microbiologic applications were made under aseptic conditions with using appropriate selective broths or incubation procedures according to the selected bacteria. After the microbial procedures, SEM micrographs were used for bacterial counting. Likely hood ratio (LHR) test was used to evaluate the statistical data. Pearson's chi square or Fisher's exact chi square tests were used if significant differences were found among groups. p -value of <0.05 was considered statistically significant.

Results: LHR test revealed significant differences between group 1 and 2 according to bacterial growth ($LR = 23,067$, $p < 0.001$). CH was significantly reduced the number of MS ($p < 0.001$). However no significant differences were found between Group 3 and 4 according to disinfectant.

Conclusion: Within the limitations, according to these results 0.12% CH was used for reducing the number of MS on thermoplastic appliance surface.

FC108

Do Intracoronar Bleaching Methods Effect on Shear-Bond-Strengths of Orthodontic Brackets?

Mehmet Akın¹, Yasin Erdem Akgül¹, İsmail Davut Çapar²

¹Department of Orthodontics, Selçuk University, Konya, Turkey,

²Department of Endodontics, Katip Çelebi University, İzmir, Turkey

Objective: The aim of this study was to evaluate the effects of different intracoronar 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 cemento-enamel 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. Intracoronar 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.

FC109

Relationship Between Cervical Column Morphology and Skeletal Deep Bite

Shahin Emami Meybodi¹, Hajir Rahimi¹, Leyli Sadri²

¹Orthodontic Department, Islamic Azad University, Dental Branch, Tehran, Iran, ²Students Research Center, Torabinejad Dental Research Center, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran

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 column 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

FC110

Investigation of Cement-Y-TZP Bond-Strength After Different Surface Treatments

Ovul Kumbuloglu, Bengisu Yıldırım, Ahmet Saracoglu
Department of Prosthodontics, Ege University, İzmir, Turkey

Objective: The aim of this study was to evaluate the bond strength between Y-TZP and various luting agents following different surface treatment techniques.

Materials and methods: Y-TZP specimens ($2 \times 2 \times 2$ cm) were polished and then divided randomly into three groups as; (i) Control, (ii) Silica coating with Rocotec (3M-ESPE) and (iii) Experimental Zr Primer (Bisco). After surface treatments, cement specimens ($2 \text{ mm} \times 3 \text{ mm}$) of Super Bond C&M (Sun Dental), Bifix QM (VOCO), Panavia F2.0 (Kuraray), G-Cem (GC) and Poly-F (Dentply) were bonded onto testing surfaces. All specimens were subjected to thermocycling ($5\text{--}55^\circ\text{C}$, 5500 cycles), followed by shear bond strength test on a universal testing machine with a crosshead speed of 0.5 mm/min. Surfaces were evaluated under SEM. All data were statically analyzed with SPSS ($p < 0.05$).

Results: Difference among bond strength values of cements to zirconium oxide material groups investigated was statically significant. The highest bond strength in control group was observed in Panavia ($11.8 \pm 1.5 \text{ MPa}$), where the lowest bond strength value was recorded with Poly F ($1.27 \pm 0.3 \text{ MPa}$). The highest bond strength in silica coating group was observed with Super Bond ($25.32 \pm 2.2 \text{ MPa}$), while the lowest value was in Poly F ($1.73 \pm 0.2 \text{ MPa}$). In Zr Primer group, the highest value was observed in Panavia ($15.43 \pm 1.9 \text{ MPa}$) where the lowest value was recorded in Poly F ($2.24 \pm 0.5 \text{ MPa}$).

Conclusion: Within limitations of this study, combination of silica coating Y-TZP and a 4-META/MMA-TBB based self-cure luting cement (Super-Bond C&B) yields the highest bond strength among the groups.

FC111

Effect of Curing Mode on Microhardness of Resin-Modified vs. Conventional Glassionomer

Mohamed Hussein Zaazou

Department of Restorative & Dental Material Research,
Oro-Dental Division- National Research Center, Cairo, Egypt

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 mean 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.

FC112

Effect of Different Exposure Times on the Amount of Residual Monomer Released from Adhesive Systems

Mustafa Altunsoy¹, Murat Selim Botsalı², Gonca Tosun³, Ahmet Yaşar⁴

¹Department of Pediatric Dentistry, Şifa University, İzmir, Turkey, ²Department of Pediatric Dentistry, Selçuk University, Konya, Turkey, ³Department of Pharmacy, Karadeniz Technical University, Trabzon, Turkey, ⁴Department of Chemistry, Karadeniz Technical University, Trabzon, Turkey

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 Tukey 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.

FC113

Effect of Surface-Treatments on Bonding of Composites to Porcelain

Hatice Özdemir, Nuran Yanıkoğlu

Department of Prosthodontics, Faculty of Dentistry, Atatürk University, Erzurum

Purpose: The aim of this study was to evaluate the shear bond strength of nano-hybrid and nano-ceramic composite resins to two feldspathic porcelains (Vita and Ivoclar).

Materials and methods: One hundred and twenty ceramic disc, 7 mm in diameter and 3 mm thick, were fabricated from feldspathic porcelain. The following surface treatment was applied on

the ceramic surface: (i) Hydrofluoric acid (9.5%) + silane, (ii) Air-abrasion (50 µm Al₂O₃ particles) + silane, (iii) Air-abrasion = Control group. Nano-hybrid and nano-ceramic composite resin was placed on the porcelain surface and they were polymerized. After the surface treatments, the surfaces of two marks feldspathic ceramics were analyzed topographically under scanning electron microscopy (SEM) at magnification of ×1000 and ×2000. Half of the specimens were stored in 37 ± 2°C distilled water and another half were subjected to thermocycling (5000 cycles between 5 and 55°C) before shear bond strength testing. The samples placed in an universal testing machine and applied shear force until separation occurred. The data were analyzed by multi-way analysis of variance (ANOVA) and Duncan test (p < 0.05).

Result: The results show that Ivoclar porcelain and Vita porcelain had almost equal fracture values. Nano-hybrid composite resin showed high bond strength than nano-ceramic composite resin. In the Ivoclar porcelain, hydrofluoric acid etching had highest fracture values than other surface treatments, and in the vita porcelain air-abrasion had a little difference from hydrofluoric acid etching.

Conclusion: Surface treatments and types of composite resin effected the bonding to the porcelain surface.

FC114

Effects of Boron on the Physical Properties of PMMA

Ali Kemal Ozdemir, Derya Özdemir Doğan, Faik Tugut, Hakan Demir, Hakan Akin

Department of Prosthodontics, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey

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 (transverse 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% Borax 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

Ewelina Mielko¹, Jakub Nowak², Renata Chalas¹

¹*Department of Conservative Dentistry, Medical University, Lublin, Poland, ²Department of Chemistry, The John Paul II Catholic University, Lublin, Poland*

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 1 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 the 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

Halenur Onat, Gül Tosun

Department of Pediatric Dentistry, Selçuk University, Konya, Turkey

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. 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

Fadhel Ali Alsanabani¹, Ahmed Abdullah Madfa¹, Jaber Saleh Alsanabani¹, Nasr Hamid Alqudaimi²

¹*Department of Conservative Dentistry, Faculty of Dentistry, Thamar University, Dhamar, Yemen, ²Department of Orthodontic*

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 packing amalgam gingivally combined by composite occlusally.

FC118

Influence of TiO₂ Nanoparticles on Surface Microhardness and Roughness of Experimental Resin Composites

Zeynep Yegin, Gül Tosun

Department of Pediatric Dentistry, Selçuk University, Konya, Turkey

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

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 ($\alpha = 0.05$). 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

Meral Arslan Malkoç¹, Necla Demir², Abdülkadir Şengün³, Şerife Buket Bozkurt⁴, Sema Sezgin Hakkı⁵

¹Department of Prosthodontics, İnönü University, Malatya, Turkey, ²Department of Prosthodontics, Selçuk University, Konya, Turkey, ³Department of Operative Dentistry, Kırıkkale University, Kırıkkale, Turkey, ⁴Research Center, Selçuk University, Konya, Turkey, ⁵Department of Periodontology, Selçuk University, Konya, Turkey

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 Automix (Ivoclar)] were evaluated. Totally, ten cylinders (5 × 2 mm), prepared by using different resin cements were incubated in α MEM 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 α MEM 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 μ l 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 Automix, 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

Taraji Ali Abdallah

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

Dalia Mohammed Moheb, Mervat Rashed,

Manal Ahmed Elsheikh

Pediatric Dentistry Departement, Oral and Dental Medicine School, Cairo University

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

Murat Ünal¹, İhsan Hubbezoğlu², Recai Zan³, Arife Kapdan¹, Feridun Hürmüzlü²

¹Cumhuriyet Üniversitesi Dişhekimliği Fakültesi Pedodonti Anabilimdalı, ²Cumhuriyet Üniversitesi Dişhekimliği Fakültesi Restoratif Diştedavisi Anabilimdalı, ³Cumhuriyet Üniversitesi Dişhekimliği Fakültesi Endodonti Anabilimdalı

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, Heliaseal and Heliaseal 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

Kübra Tonguç Altın¹, Nüket Sandallı¹, Güलगül Duman², Senem Selvi Kuvvetli¹, Emine Nursen Topçuoğlu³, Güven Külekçi³

¹Department of Pediatric Dentistry, Faculty of Dentistry, Yeditepe University, Göztepe, İstanbul, Turkey, ²Department of Pharmaceutical Technology, Faculty of Pharmacy, Yeditepe University, Atasehir, İstanbul, Turkey, ³Department of Oral Microbiology, Faculty of Dentistry, İstanbul University, İstanbul, Turkey

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 were 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

Shady Ahmed Moussa¹, Samy Youssef El Bauomy²

¹Department of Pediatric Dentistry, Zagazig University, Zagazig, Egypt, ²Department Pediatric Dentistry & Dental Public Health, Faculty of Dental Medicine, Al-Azhar University, Cairo, Egypt

Aim: This 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 remineralized 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.

FC125

Effect of Water Rinsing After APF Gel on Plaque Acidity

Fatemeh Mazhari¹, Homa Noorollahian², Marjan Sharifi³, Mahsa Sharifi⁴

¹*Pediatric Department, Dental Material Research Center, Mashhad University of Medical Sciences, Mashhad, Iran,*

²*Pediatric Department, Oral & Maxillofacial Diseases Research Center, Mashhad University of Medical Sciences, Mashhad, Iran,*

³*Pediatric Department, Mashhad University of Medical Sciences, Mashhad, Iran,* ⁴*Restorative Department, Mashhad University of Medical Sciences, Mashhad, Iran*

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 application can reduce its effect on dental plaque acidity; however, the inclusion of a controlled water rinse 15 min after APF gel application did not seem to influence the inhibitory effect of fluoride on plaque acidity.

FC126

Mineral Mapping of Incipient Fissure Enamel Lesions

Mahdi Shahmoradi, Mike Swain

Department of Dental Biomaterials, University of Sydney, Sydney, NSW, Australia

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.

FC127

Consequences of Untreated Caries in Preschool Children Expressed According to Pufa-Index

Agim Begzat Begzati, Teuta Kutlllovci, Blerta Xhemajli, Ajtene Begzati, Fehim Haliti, Blerta Musliu, Rina Prokshi, Arijana Bytyci
Department of Pediatric and Preventive Dentistry, Dentistry School, Kosovo, Serbia

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 Prishtina, 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.

FC128

Natural Mouthwash Provides Long Term Dental Prevention

Bálint Bencze

Laboratory Medicine Institute, PTE KK, Pécs, Hungary

Introduction: Mouthwashes used in daily dental prevention consist mainly of synthetic active agents increasing the chemical exposure of the body.

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. parapsylosis*. We used tube dilution method. Direct bactericide 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 prepare 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

Raghad Hashim¹, Sheila Williams², W. Murray Thomson³

¹Growth and Development Department, Ajman University of Science and Technology, Ajman, United Arab Emirates, ²Social Sciences Department, Otago University, Dunedin, New Zealand, ³Oral Science Department, Otago University, Dunedin, New Zealand

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

Saima Akram Butt¹, Anwar Ali², Lubna Avesi³, Tazeen Mustansir Raja³, Mehwish Hussain⁴

¹Department of Pathology, Dow University of Health Sciences,

²Department of Oral Surgery, Dow University of Health Sciences,

³Department of Histopathology, Dow University of Health

Sciences, ⁴Department of Statistics and Research, Dow University of Health Sciences

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

Afsheen Maqsood¹, Anwar Ali², Tazeen Mustansar³, Mehvish Hussain⁴, Naseer Ahmed⁵, Saima Butt⁶

¹Department of Oral Pathology, Dow University of Health

Sciences, Karachi, Pakistan, ²Department of Surgery, Dow

University of Health Sciences, Karachi, Pakistan, ³Department of

Histopathology, Dow University of Health Sciences, Karachi,

Pakistan, ⁴Department of Research, Dow University of Health

Sciences, Karachi, Pakistan, ⁵Department of Prosthodontics,

⁶Department of Oral Pathology

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.

FC132

The Role of a Fluorescence Screening Method in the Detection of Oral Precancer and Cancer

Şebnem Erçalık Yalçınkaya¹, Nihan Aksakallı², Asım Dumlu¹, Canan Alath², Semih Özbayrak¹

¹Department of Dentomaxillofacial Radiology, Marmara University, Istanbul, Turkey, ²Department of Tumour Pathology and Oncologic Cytology, Institute of Oncology, University of Istanbul, Istanbul, Turkey

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 cytopathology (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.

Theme: Implantology: Oral Surgery

FC133

A Case of Aggressive Calcifying Cystic Odontogenic Tumor

Ali Abu Hantash¹, Alaa Shuibat², Farid Museyibov², Benay Yıldırım², Serkan Dadakoğlu¹

¹Oral Surgery Department, Ankara University, Ankara, Turkey,

²Oral Pathology Department, Gazi University, Ankara, Turkey

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.

FC134

A Rare Foreign Body within a Radicular Cyst in a Child

Marouene Bel Hadj Hassine, Hajer Hentati, Nour Ben Messaoud, Radhia Ben Ali, Jamil Selmi

Department of Oral Medicine and Oral Surgery

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

Akanbi Olurotimi Olojede¹, Olutayo James¹,
Olalekan Micah Gbotolorun¹, Segun Oluseye²

¹College of Medicine, University of Lagos, Idiaraba, Lagos,

²Lagos State Health Service Commission Lagos

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

Ingy Ahmed Hussein¹, Hamed Anwar Fouad¹,
Sahar Mohamed El Sheikh¹, Ibrahim Mohamed Zeitoun²

¹Department of Oral Pathology, Alexandria University, Alexandria, Egypt, ²Department of Oral & Maxillofacial Surgery, Alexandria University, Alexandria, Egypt

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 Immunoexpression 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

Norina Consuela Forna

Implantology Departement, Faculty of Dental Medecine, UMF "Gr.T.Popa" Iasi

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 implanto-prosthetic rehabilitation, quantifying the necessity of classical maneuvers of measurements and vizualisation 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.

Theme: Implantology: Oral Surgery

FC138

Epidemiological Considerations for Stage 0 Bisphosphonate-Associated Maxillary Osteonecrosis

Andreea Paula Moraru, Octavian Dinca, Tiberiu Nita, Cristian Vladan, Ana Falcan, Alexandru Bucur

Department of Oral and Maxillofacial Surgery, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

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.

Free Communication Session 21 | B332 | 29.08.2013 | 11:30–12:30

Theme: Preventive Dentistry: Public Health

FC139

Can Mothers Be Empowered to Screen Dental Caries in Their Own Preschool Children?

Syarifah Haizan Sayed Kamar, Nasruddin Jaafar

Department of Community Dentistry, University of Malaya, Kuala Lumpur, Malaysia

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 finding 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 ($\kappa = 0.71$) at child level and almost perfect ($\kappa = 0.84$) 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.

FC140

Caries Experience in 6–15 Years Old Type 1 Diabetic Children in Karachi

Anjum Younus Mirker¹, Ambrina Qureshi¹,
Abdur Rasheed Rasheed²

¹Department of Community Dentistry, DIKIOHS, Dow University of Health Sciences, Karachi, Pakistan, ²Department of Research & Ph.D. Program Dow University of Health Sciences, Karachi, Pakistan

Purpose: The Present study aimed to investigate the caries experience in a group of diabetic children and determine if correlation exists between the caries experience of diabetic patients and the metabolic control of diabetes and the duration of diabetes.

Subjects and methods: A total of 105 (36 males and 69 females), 6–15 year old children with Type 1 DM attending the outpatient diabetic clinic at public sector hospital, Karachi were examined during the study. The study protocol was approved by the ethical committee of Research at DUHS. The study was conducted during period of 2 months in 2012. Caries lesions were assessed using DMF-index and Diabetes-related data were collected from medical records and completed with the lab data on HbA1c.

Results: The mean \pm SD DMFT for diabetic children was 4.18 ± 1.98 ($D/d = 3.44 \pm 1.7$, $M/m = 0.44 \pm 0.85$, and $F/f = 0.33 \pm 0.60$). The data showed a significant ($p < 0.05$) association between the level of glycemic control and mean DMFT score in children with primary and secondary dentition.

Conclusion: In conclusion, our findings show significantly higher DMFT scores were observed in our study regarding the caries experience of diabetic children at primary and permanent dentition level. significant correlation exist between DMFT scores and glycemic control.

On the other hand, our results suggest that the level of untreated dental decay among the diabetic children is considerably high indicating that the diabetic patients as well as their parents lack important knowledge about oral health problems.

FC141

Delay in Diagnosis of Oral Cancer in Malaysian Population

Ngah Nurul Aida¹, P. Shanmuhasuntharam²,
Jamaludin Marhazlinda²

¹Universiti Teknologi MARA, ²University of Malaya

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 reason 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 continues 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

Afesobi Afunbiokin Leo Olagbaye, Omolara G. Uti,
Oyinkansola O. Sofola

*Department of Preventive Dentistry, College of Medicine,
University of Lagos, Lagos, Nigeria*

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

Miljana Miljko Petrovic Punoševac¹, Slobodan Grašić²,
Slađana Mitic³

¹Preventive Paediatric Dentistry, Health Care Centre, Niš, Serbia,

²Waterworks Kruševac, Kruševac, Serbia, ³Preventive Paediatric Dentistry, Health Care Centre, Prokuplje, Serbia

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 Niš 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 wellbeing.

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

Kazim Serhan Aksit¹, Gamze Mandalı¹, Funda Erol²,
Aysegül Yurdakos¹

¹Department of Prosthodontics, Private Provincial Administration of Istanbul, Oral and Dental Diseases Hospital, Istanbul, Turkey,

²*Department of Prosthodontics, Faculty of Dentistry, Yeni Yuzyil University, Istanbul, Turkey*

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.

FC145

Assesment of Dimensional Stability and Accuracy of Three Different Elastomeric Impression Materials Using Micro-Computed Tomography

Yılmaz Umut Aslan, Yasemin Özkan

Department of Prosthodontics, Faculty of Dentistry, Marmara University, Istanbul, Turkey

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 (μ 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 ± 0.001) and the highest change was observed in polyether group at day 7 (-0.052 ± 0.004).

Conclusion: From the standpoint of volumetric accuracy and stability, all three elastomeric impressions are clinically acceptable and μ CT is a useful tool for assessments of volumetric dimensional changes.

FC146

Biomechanical Aspects in Prosthetic Rehabilitation Through Removable Partial Denture

Ovidiu Stamatini¹, Monica Andronache¹, Doriana Forna², Norina Consuela Forna¹

¹Department of Implantology, Removable Prosthetics, Technology, Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania, ²Faculty of Dental Medicine, Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania

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 biomechanics 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.

FC147

Bond Strength of Different Adhesive Systems on Resin-bonded FDPs with Different Inlay-Retainer Designs

Ediz Kale¹, Ayça Deniz İzgi², Remzi Nigiz²

¹Department of Prosthodontics, Mustafa Kemal University Faculty of Dentistry, Hatay, Turkey, ²Department of Prosthodontics, Dicle University Faculty of Dentistry, Diyarbakir, Turkey

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 ($\alpha = 0.05$).

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.

FC148

Relationship Between Satisfaction with Complete Dentures and Basal Seat Characteristics

Bolanle Oyeyemi Akinboboye¹, Olufemi Peters Shaba¹, Patricia Tokunbo Akeredolu¹, Olabisi H. Oderinu²

¹Department of Restorative Dentistry, University of Lagos, Lagos, Nigeria, ²Department of Restorative Dentistry, Lagos University Teaching Hospital, Lagos, Nigeria

Aim: The purpose of this study is to investigate the relationship between self perceived satisfaction and basal seat characteristics among edentulous patients.

Method: Thirty patients participated in the study but only 24 complied with the study protocol. A digital caliper was used to determine the residual ridge width and height. The shape of residual ridge was determined using a reference scale and complete dentures fabricated and fitted. Subjects were followed up for a year and required to fill a structured questionnaire on satisfaction.

Result: The use of objective assessment in classifying maxillary residual ridge showed that there was a significant association ($p = 0.045$) between the ridge and self perceived satisfaction. There was no significant association between self perceived satisfaction and shape of mandibular ridge, palatal vault and vestibular depth.

Conclusion: There is a significant association between shape of maxillary residual ridge and satisfaction of complete denture. U shaped residual ridge augments satisfaction.

Free Communication Session 23 | B343 | 29.08.2013 | 11:30–12:30

Theme: Preventive Dentistry: Periodontology

FC149

Extrinsic Stain Removal with a Toothpowder: A Randomized Controlled Trial

Muhammad Khalil Khan¹, Syed Akhtar Hussain Bokhari², Ayyaz Ali Khan³, Tasleem Hosein⁴, Muhammad Usama Khan⁵

¹College of Dentistry, Qassim University, KSA, ²University Medical & Dental College, Faisalabad, Pakistan, ³Sheikh Zayed Federal Postgraduate Medical Institute Lahore, Pakistan, ⁴Fatima Jinnah Dental College, Karachi, Pakistan, ⁵Liaquat College of Medicine & Dentistry, Karachi, Pakistan

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 \times 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

Basma Mostafa Zaki¹, Omnia Aboul Dahab², Somaya Abdel Lateef³, Wessam Abd Elmoniem², Amany Mohy Eldin¹, Marwa Kamal³, Abir El Mouelhy¹

¹Department of Surgery and Oral Medicine, National Research Center, Cairo, Egypt, ²Department of Periodontology, Faculty of Oral and Dental Medicine, Cairo University, Egypt, ³Department of Microbiology and Immunology, Faculty of Medicine, Cairo University, Egypt

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

Iryna Mazur, Pavlo Leonenko

Department of Dentistry, National Medical Academy of Postgraduate Education named after PL Shupyk, Kiev, Ukraine

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 – deoxypyridinoline (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

Mariana Caramida, Claudiu Calin, Loredana Cristina Dumitrascu, Ruxandra Ionela Sfeatcu, Claudiu Ciortea, Mihai Ciortea, Adina Mihaela Dumitrache

Department of Oral Health, Faculty of Dentistry, “Carol Davila” Medicine and Pharmacy University, Bucharest, Romania

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 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

Martu Silvia, Rudnic Ioana, Martu Alexandra, Solomon Sorina, Balan Adriana, Sincar Dorina Cerasella

Gr.T. Popa Medicine and Pharmacy University, Iasi, Romania

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

Helin Kara, Sule Bulut, Serif Bayazit Bagci

Department of Periodontology, Baskent University Faculty of Dentistry, Ankara, Turkey

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. StentCad 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 StentCad 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 StentCad 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, StentCad 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

Walid Samir Salem

Oral and Maxillofacial Surgery and Diagnostic Science, Qassim University, Saudi Arabia

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

Philipp Streckbein¹, Roland Streckbein², Jan Falco Wilbrand¹, Christoph Yves Malik¹, Heidrun Schaaf¹, Hans Peter Howaldt¹, Matthias Flach³

¹Department of Cranio-Maxillo-Facial Surgery, Justus-Liebig-University, Gießen, Germany, ²Institute for Postgraduate Education in Dental Implantology (IZI), Limburg, Germany, ³Department for Virtual Prototyping, University of Applied Sciences, Koblenz, Germany

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 $<15^\circ$. 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 ($<15^\circ$) 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 Support Fixed Ceramic Fused to Metal Prosthesis in Periodontally Compromised Mouths

Saad Yasin Nori

Mosul Dental College, Prosthodontic Department, Iraq

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. Antibio-

tic were given pre and postoperatively for a period of 5 days. Chlorhexidine mouth washes and calcium and vit. D tablets were prescribed also. After a 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 periimplant soft tissues revealed excellent osseointegration 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 osseointegration 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

Omid Moghaddas¹, Omid Moghaddas²

¹Department of Periodontology, Islamic Azad University, Dental Branch, Tehran, Iran, ²Department of Periodontology, Kerman University of Medical Sciences, Kerman, Iran

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 parallel 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 corticocancellous 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.

Theme: Preventive Dentistry: Epidemiology

FC159

Oral Health Knowledge and Behavior Among 12-Year Olds Female StudentsEman Abdalhamed Almenezaa¹, Huda Shaker Nazar¹, Sabiha Abdulkadir Almutawa¹, Jitendra Ariga², Pramod Soparkar³¹Ministry of Health, Dental Department, Kuwait, ²School Oral Health Program, MOH, Kuwait-Forsyth Institute, Cambridge, United States, ³Forsyth Institute, Cambridge, United States**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-Ahmadi (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 DecadeSiew Lian Yaw¹, Khairiyah Abdul Muttalib¹, Jamalludin Ab Rahman²¹Oral Health Division, Ministry of Health Malaysia, WP Putrajaya, Malaysia, ²Department of Community Medicine, International Islamic University Malaysia, Kuantan, Malaysia**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 (7.1–51.1%). 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.

FC161

Odontogenic Infections Due to the Untreated Caries in Children

Teuta Ademaj Kutlllovci, Agim Begzati, Aida Rexhepi, Blerta Xhemajli, Nita Kutlllovci

Department of Pediatric and Preventive Dentistry, University of Pristina, Dentistry School, Pristina, Republic of Kosovo

Introduction: Odontogenic infections are characteristic pathology encountered our children as a result of untreated caries. They can be manifested in acute and chronic form.

The aim of this study is to present the types of odontogenic infections as a caries complications, particularly from second deciduous molars and first permanent molars.

Materials and methods: In this study were included 707 children (541 school and 166 preschool children) from Prishtina, Republic of Kosova, age 5–15 years. It was determined the prevalence of caries and defined the level and types of infections from carious teeth. Also were researched the predisposed teeth for these infections.**Results:** The results show high levels of odontogenic infections (15.7%) due to the high level of untreated caries (80%). In the primary dentition have dominated parulis infections (35.6%), while in permanent dentition, chronic apical periodontitis (31.5%). Absces and flegmona were more rare. The most frequent causative teeth were: second primary molars (49.7%) and the first permanent molars (66.1%).**Conclusions:** The untreated molars of the both dentitions are the most predisposed teeth that caused the odontogenic infections. Prevention and early treatment of initial caries can be associated with lower incidence of odontogenic infection.

FC162

Epidemiological Study of Oral Cancer in Colombia: 1990–2009Angel Emilio Bernal*Department of Morphology, Faculty of Medicine, National University of Colombia, Bogotá, D.C., Colombia*

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 15 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 4.5% 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.

FC163

Assessing Oral Health Related Quality of Life in Oncologic PatientsSüleyman Ziya Şenyurt¹, Kemal Üstün¹, Eda Çetin Özdemir¹, Ufuk Sezer¹, Ozan Balakan², Mutan Hamdi Aras³*¹Department of Periodontology, Faculty of Dentistry, Gaziantep University, Gaziantep, Turkey, ²Department of Medical Oncology, Faculty of Medicine, Gaziantep University, Gaziantep, Turkey, ³Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Gaziantep University, Gaziantep, Turkey*

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 caries 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.

Free Communication Session 26 | B342 | 29.08.2013 | 14:00–15:00**Theme: Preventive Dentistry: Orthodontics**

FC164

Orthodontic Management of Impacted TeethAmr Nabil Asker*Asker Orthodontic Center and Institute-Masnoura-Egypt*

Aim: Orthodontic management of impacted teeth is interesting topic in orthodontic, so i'll give small hint on impacted tooth management in orthodontic-traction 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 appearance 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 untill it become in its normal position.

- Dentigerous cyst disappear after complete alignment and bone formed in old canine place with normal gingiva architecture, 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 supernumerary and expose upper centrals removing any bone above them-attach eyelets on them and began traction steps, i did closed traction in this case as 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 permanent teeth.

FC165

Effect of Intra-Arch Tooth-Size Arch-Length Discrepancy on the Accuracy of Digital Models in Orthodontic DiagnosisRamy Mohammed Fathy, Islam Tarek Hassan, Noha Ezzat Sabet*Department of Orthodontics, Ain-Shams University, Cairo, Egypt*

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 Ileri, Zeliha Muge Baka, Mehmet Akin, Seza Apilogullari, Faruk Ayhan Basciftci

Department of Orthodontics, Selcuk University, Konya, Turkey

Aim: The aim of this prospective, randomized, controlled, cross-over 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

Fatma Deniz Uzuner¹, Emine Kaygısız¹, Zeynep Turgut Çankaya²

¹Department of Orthodontics, Gazi University, Ankara, Turkey,

²Department of Periodontology, Gazi University, Ankara, Turkey

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 criterias: Angle Class I malocclusion with minimal crowding, nonsmoker, free of dental plaque, and no systematic 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 Nalçacı¹, Yener Özat², Serpil Çokakoğlu¹, Muhammet

Hakan Türkkahraman¹, Süleyman Önal³, Selçuk Kaya³

¹Department of Orthodontics, Faculty of Dentistry, Suleyman

Demirel University, Isparta, Turkey, ²Department of

Periodontology, Faculty of Dentistry, Suleyman Demirel

University, Isparta, Turkey, ³Department of Medical

Microbiology, Faculty of Medicine, Suleyman 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

Department of Prosthetic Dentistry, Faculty of Dentistry, Near East University

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 standart 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 maxillar dentition and poured in type V stone. Clinical crown dimensions were measured with a digital calliper. 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 insicor 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.

FC170

Effect of In-Office Bleaching Units on Composite Shear Bond Strength

Homayoon Alaghehmand, Marzieh Rohaninasab

Department of Esthetic & Restorative Dentistry, Babol University, Babol, Iran

Aim: This study evaluated the best and most effective method for in-office bleaching with the least affect on microshear bond strength (MSBS) of composite fillings.

Materials and methods: Class 5 cavities were prepared on buccal surface of 50 third human molars, pulpal wall of 25 teeth were in dentin and for 25, in enamel. Then cavities were restored with single bond 2 bonding system and composite (Z250). Teeth were studied in ten groups (n = 5 dentin and enamel): bleached with Hydrogen peroxide (HP) + Zoom, with HP + LED, with HP + Diode laser, with HP and 1 control groups that was not bleached. Teeth colors were monitored before and after bleaching with Easy shade unit and MSBS were performed. The MSBS and deltaE results were analyzed with Kolomogorov–Smirnov to evaluate normal distribution of data. Kruskal–Wallis test for abnormal distribution data and Tukey's test for data with normal distribution used. A value of $p < 0.05$ was considered significant.

Results: Bleaching can reduce MSBS of composite in all groups but there are not statistically differences. deltaE changed more in diode laser group.

Conclusion: Diode laser is preferred for accelerate bleaching process and rebonding of composite restoration margins after bleaching is recommended.

Theme: Preventive Dentistry: Orthodontics

FC171

Er.YAG Laser Assisted Labial Frenectomies

Marina Jugoslav Kacarska¹, Maja Gjorovska²

¹Department of Oral Surgery, Faculty of Dentistry, University St. Cyril and Methodius, ²Depratment of Oral Surgery, University Dental Clinical Center, St. Pantelejmon

Aim: To evaluate the Er.YAG laser assisted labial frenectomies, regarding the type of anesthesia, patients' compliance, hemosthesis and postoperative outcomes.

Background: In the treatment of low and overactive buccal frenulum Er: YAG laser surgery has an inherent characteristic outcome of minimal bleeding, a reduced need for anesthesia and excellent healing process. (Litwak E: Diastema closure and frenectomy with Er. Yag. laser. Clinical Bulletin 34/10). Postoperative findings showed no complications. The healing process was very fast,

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 2012) 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

Beyza Tagrikulu¹, Hatice Ozlem Carsanbali²,

Asuman Deniz Gumru Celikel¹, Elif Fatma Erbay¹

¹Department of Orthodontics, Faculty of Dentistry, Istanbul University, ²Faculty of Dentistry, Istanbul University

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

Edlira Papa

Department of Stomatology, American University of Tirana, Tirana, Albania

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 being 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 first 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.

Free Communication Session 28 | B360 | 29.08.2013 | 14:00–15:00

Theme: Implantology: Oral Surgery

FC174

Comparative Evaluation of Chronic Periapical Lesions Diagnosis Based on Conventional Radiography Semi-Serial Sections Histopathology and Serial Sections Histopathology

Resmije Ademi¹, Lumniye Gashi Luci², Fisnik Kurshumliu², Feriale Perjuci¹, Ali Gashi¹, Zana Agani¹, Jehona Ahmedi¹

¹Department of University Dental Clinical Center of Kosova,

²Department of Pathology, University Clinical Center of Kosova

Objective: Was to find the accurate method for chronic periapical lesions diagnosis. It was achieved performing comparative evalua-

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 apicoectomy. Bioptic material was obtained with lesions curettage during apicoectomy 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 and 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

Department Oral & Maxillofacial Surgery, Faculty of Dentistry, Tripoli University, Libya

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 satisfaction, which were our goal for this case.

Conclusions: It can therefore be concluded that while initial research and clinical use were directed primarily toward the edentulous patient, more recent studies have focused on the 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

Gabriella Dvorak, Uwe Yacine Schwarze, Stefan Tangl, Hermann Agis, Alexander Fögl

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) Lyostyt soaked in calcitriol was placed, in the vitamin D- group (n = 20) and control group (n = 20) Lyostyt 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

Department of Oral Surgery, King's College Hospital, London, United Kingdom

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:

Cycle percentage compliance	%
1	71.8
2	73.7
3	76.3
4	53.5
5	70.5

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 emphasising 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%

Jehona Reçica Ahmedi¹, Osman Sejfi², Enis Ahmedi³, Zana Agani¹, Feriale Perjuci¹, Resmije Ademi¹, Ali Gashi¹, Vjosa Hamiti¹

¹Department of Oral Surgery, University Dental Clinical Center of Kosova, ²Department of Maxillofacial Surgery, University Clinical Center of Kosova, ³Department of Prosthodontics, University Dental Clinical Center of Kosova

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 belong 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

Tir Touil Meddah Aicha¹, Kiari Fatima², Leke André³, Meddah Boumediene²

¹Bioconversion, Microbiological Engineering and Health Security Laboratory, FSNV, University of Mascara, Algeria, ²Laboratoire de Recherche ur les Systems Biologiques et la Géomatique, FSNV, University of Mascara, Algeria, ³Departement of Peditry, CHU Nord Amiens, Amiens, France

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

Cathy Nisha John¹, Lawrence Xavier Graham Stephen¹, Charlene Wilma Joyce Africa²

¹Department of Oral Medicine and Periodontics, University of the Western Cape, Cape Town, South Africa, ²Department of Medical Biosciences, University of the Western Cape, Cape Town, South Africa

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 $\rho = 0.16452$, $p = 0.0726$).

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 immunosuppression 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

Çiğdem Paşalı¹, Alpdoğan Kantarcı², Gülnur Emingil¹

¹Department of Periodontology, School of Dentistry, Ege University, İzmir, Turkey, ²The Forsyth Institute, Cambridge, United States

Objective: The aim of the present study was to investigate the clinical and microbiologic efficacy of scaling and root planing (SRP) in the management of generalized aggressive periodontitis (G-AgP).

Methods: Sixteen patients diagnosed with G-AgP and 14 healthy subjects were included. G-AgP 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 G-AgP 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 G-AgP, 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 Immunosorbent Assay (ELISA) 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, Naser 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-Zahra 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 $\alpha 6 \beta 4$ chain $\beta 4$ and laminin $5 \gamma 2$, marker molecules of the implant-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 the 2 ($p = 0.009$), 4 ($p = 0.001$) as well as 12 week ($p = 0.005$) follow up. Furthermore, the expression of *lanc2* was significantly higher following punch exposure after 1 ($p = 0.033$), 2

($p = 0.041$), 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 flap surgery. 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

Svend Richter, Sigfus Thor Eliasson

Faculty of Odontology, University of Iceland, Reykjavik, Iceland

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 50.3% 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

Neamat Hassan Abu Bakr, Habab Osman Alamin,

Yahia Eltayeb Ibrahim

Conservative Dentistry Division, Department of Oral Rehabilitation, Faculty of Dentistry University of Khartoum, Khartoum, Sudan

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

Umut Cakan, Haluk Baris Kara

Istanbul Medipol Üniversitesi Diş Hekimliği Fakültesi, Istanbul, Turkey

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 ΔE 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

Gözde Çelik, Artur Ismatullaev, Tuğrul Sarı, Aslıhan Üşümez
Department of Prosthodontics, Bezmialem Vakıf University,
Istanbul, Turkey

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 Al_2O_3 . 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 testing machine. Three-way ANOVA was used to analyze the data. The Tukey HSD test was performed for multiple comparisons ($\alpha = 0.05$).

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

Ali Kemal Ozdemir¹, Hakan Akin¹, Hakan Demir¹, Faik Tugut¹, Derya Ozdemir Dogan¹, Zubeyde Akin Polat²

¹Department of Prosthodontics, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey, ²CUTFAM Research Center, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey

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 pneumoniae*, *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 boric 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 Boric 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

Umut Cakan¹, Ozlem Kara², Haluk Baris Kara¹

¹Faculty of Dentistry, Istanbul Medipol University, Istanbul,

²Faculty of Dentistry, Selçuk University, Konya

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 × 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 significant 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.

FC193

The Prosthetic Rehabilitation of a Patient with Down Syndrome

Teuta Pustina-krasniqi, Kujtim Shala, Gloria Staka, Teuta Bicaj, Enis Ahmedi, Linda Dula, Zana Lila Krasniqi
Prosthetic Dentistry, Dentistry Branch, Medical Faculty, University of Prishtina

Aim: Aim of this case report was to present the difficult approach on treating patient with Down Syndrom, selecting the most conservative prosthetic protocol.

Materials and methods: The dental manifestation that we have inspected were: development of gingivitis, the underdevelopment of the maxilla, incomplete development of the midface complex, soft hypotonicity of muscles, extracted teeth that contributed to malocclusion, scalloped, fissured tongue. A smaller maxilla contributed to an malocclusion, leading to poor positioning of teeth. Present teeth were as follows: days 17, 15, 13, 21, 22 and 26. After analyzing X-ray panoramic (OPG), clinical examination and study models, we came to the treatment plan, as follows: an overdenture in the upper jaw anchored on the remaining teeth and removable partial denture (RPD) in the lower jaw. The simple procedures for making overdenture and RPD with framework were used.

Discussion: The overdenture was chosen as a treatment alternative to overcome a smaller maxilla that contributed to a negative overbite and overjet.

We can suggest what people with Down syndrome have no unique health problems, an so far we should be careful on selecting the most conservative and appropriate treatment protocol. At the end of therapy, it was patient satisfaction that matters the most.

Free Communication Session 32 | B360 | 29.08.2013 | 15:30–16:30

Theme: Dental Treatment and Restorative Dentistry: Endodontics

FC194

Efficacy of Platelet-Rich-Fibrin and Mineral-Trioxide-Aggregate in Pulpotomy of Decayed Permanent Teeth with and without Low-Level-Laser-Therapy: A Clinical Trial

Fayaz Ahmed Ahangar¹, Riyaz Farooq Shah¹, Aamir Rashid Purra¹, Mohammed Imran Kaiser²

¹*Department of Conservative Dentistry & Endodontics, Govt Dental College & Hospital, Srinagar, India,* ²*Department of Conservative Dentistry & Endodontics, Bapuji Dental College & Hospital, Davangere, India*

Aim: Low-level-laser therapy (LLLT) has been reported to be responsible for promoting photostimulatory and photobiomodulatory effects in-vivo and in-vitro, stimulating cell growth, increasing cell metabolism, improving cell regeneration and invoking an anti-inflammatory response. The aim of this study was to compare the clinical and radiographic efficacy of platelet rich fibrin (PRF) and mineral trioxide aggregate (MTA) as pulpotomy medicament on pulpally exposed decayed permanent teeth with and without LLLT having observation periods of 1, 3, 6 and 12 months.

Materials and methods: A clinical trial was performed in which a total number of 90 patients were treated and divided randomly into two groups. In Group-A, teeth were treated by placing PRF and MTA as pulpotomy medicaments and in Group-B, teeth were irradiated with magneto-infra-red low-level-laser (MiltaLED/PhysioQuanta, France; 400–850 nm, 50 mT at 300 mW/cm²) for 3 min prior to the placement of PRF and MTA. All teeth were finally restored with GIC. The outcome variables considered were pain, tenderness, pulp test response, mobility, exudation, periodontal ligament space, tubercular bone pattern and pulp canal space. The appearance of any of these signs or symptoms was considered to be a failure of treatment.

Results: The results were favorable in case of Group-B as compared to Group-A in all the outcome variables. A t-test showed a statistically significant difference (p < 0.05) between the study groups.

Conclusion: Within the limitations of this study, the technique used for pulpotomy on decayed pulpally exposed permanent teeth is recommended on the basis of the obtained clinical and radiographic results.

FC195

Morphometric of Upper First Premolar Among Different Ethnic Groups in Klang Valley, Malaysia

Normaliza Ab Malik, Hanisah Hamdan, Amelia Farhana Mohd Hanafiah

Faculty of Dentistry, Universiti Sains Islam Malaysia, Malaysia

Aim: The objective of this research is to study the morphometric of upper first premolar among different ethnic groups in Klang Valley, Malaysia.

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 \pm 1.66), for teeth that has two rooted, the mean length was 20.92 mm (SD \pm 1.86) for buccal root and 20.41 mm (SD \pm 1.72) for palatal root. For three rooted, mesiobuccal root length was 19.77 mm (SD \pm 3.35), distobuccal length was 19.92 mm (SD \pm 1.67), and palatal length was 20.69 mm (SD \pm 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 \pm 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.

FC196

Multidisciplinary Approach to a Complicated Crown-Root Fracture: A Case Report

İsmail Davut Çapar¹, Tuba Gök¹, Sema Belli²

¹Department of Endodontics, Faculty of Dentistry, İzmir Katip Celebi University, İzmir, Turkey, ²Department of Endodontics, Faculty of Dentistry, Selçuk University, Konya, Turkey

Objectives: The purpose of this 3 years follow up report is to present treatment of a complicated crown-root fracture with conservative restoration techniques and re-treatment under periodontal surgery after failure.

Case: A 30 year-old patient was consulted for fractured left maxillary central incisor. Clinic and radiographic examination revealed that her maxillary left central incisor had a crown-root fracture with pulp exposure, although the fractured segment remained in place. The fractured segment was removed and the root canal was filled with gutta-percha and resin sealer using lateral condensation technique. Then, the fractured segment was placed in its original position and reattached with a bondable glass fiber-reinforced post. After 15 months clinical and radiographic examinations revealed detachment of fragments, discoloration of treated tooth and radiolucency close to fracture line of the root. Periodontal surgery was performed and voids causing coronal leakage were restored using composite resin. At 3 years, clinic and radiographic examinations showed satisfactory esthetic and functional outcome.

Conclusion: Nonsurgical treatment of complicated crown root fractures with subgingivally fracture line might result in failure. Thus complicated crown root fractures should be reconsidered with respect to the multidisciplinary approach.

FC197

New Root Canal Sealer Based on Calcium Silicate – Chitosan

Raid Fahim Salman, Dara Hamarashheed Saeed, Bassam Karim Amin

Department of Conservative Dentistry, Dental College, Hawler Medical University, Erbil, Iraq

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 thermafil 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.

FC198

Microleakage of Root Canals Treated with Laser, PDT and NaOCl

Tzvetelina Gueorgieva Gueorgieva¹, Mariya Garova Dencheva², Vasil Petrov Kalchinov¹, Julia Emilova Kamenova³

¹Department of Conservative Dentistry, Sofia, Bulgaria,

²Department Oral and Imaging Diagnostics, Sofia, Bulgaria,

³Department of Prosthetic Dentistry, Sofia, Bulgaria

Introduction: It is necessary apical part of root canals to be very good hermetically sealed to prevent the passage of bacteria and endotoxins to the peri-radicular tissues. The use of lasers and photo-activated disinfection in endodontic treatment may cause morphological changes in the dentin of the root canal.

Aim: The purpose was to compare the degree of hermetic obturation of root canals after endodontic treatment and disinfection with Nd:YAG laser, PDT with Fotosan, NaOCL 2.5% + EDTA 17% and filled with AH 26 sealer and gutta-percha.

Materials and methods: We used 30 freshly extracted single rooted teeth. All teeth are prepared with K3 – endodontic files and

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

Etleva Qeli¹, Dorjan Hysi¹, Celjana Toti¹, Elizana Petrela², Ina Droboniku³

¹Faculty of Dental Medicine, University of Medical Science, Tirana, Albania, ²Faculty of Public Health, University of Medical Science, Tirane, Albania, ³Droboniku Dental Clinic

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 16 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

Ivona Kovachevska¹, Cena Dimova¹, Zlatko Georgiev², Marjan Denkovski³, Mihajlo Petrovski¹

¹Dentistry, Faculty of Medical Science, University “Goce Delčev”

Štip, ²Faculty of Dentistry, University “Kiril and Metodij” Skopje,

³Private Dental Clinic: d-r Marijan Denkovski

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

Meltem Tekbaş Atay¹, Fatma Koray²

¹Department of Restorative Dentistry, Trakya University, Edirne, Turkey, ²Istanbul, Turkey

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 Service (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

conditions. After the soft layers of the caries dentin were removed using excavators cavities were filled with glass ionomer cement (Ketac™ Molar Easymix, 3M ESPE). At the first week and sixth month after the treatment, clinical performances in retention, marginal adaptation, caries and postoperative sensitivity of ART restorations were assessed according to USPHS criteria. Additionally, gaps on the taken replicas were studied using SEM. Mc-Nemar, Qi-Square and Wilcoxon Signed Rank test were used for the statistical analysis. 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 pulpitis ($p > 0.05$). SEM examination also showed an 8.9% increase in the frequency of marginal gaps ($p < 0.01$).

Conclusion: ART is reliable method in dental clinic over a 6 month period.

Theme: Dental Treatment & Restorative Dentistry: Endodontics

P213

Antimicrobial Efficiency of Photodynamic Therapy with Different Irradiation Durations

Ashhan Usumez¹, Cihan Yildirim², Emine Sirin Karaaslan³, Semih Ozsevik³, Yasemin Zer⁴, Tugrul Sari¹

¹Department of Prosthodontics, Bezmialem Vakif University, Istanbul, Turkey, ²Department of Endodontics, Gaziantep University, Gaziantep, Turkey, ³Department of Operative Dentistry, Gaziantep University, Gaziantep, Turkey, ⁴Department of Microbiology, Gaziantep University, Gaziantep, Turkey

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 ranged test, Kruskal-Wallis test and Dunn test.

Results: The load of microorganisms in the control group was increased. The lowest reduction of the load of microorganisms was observed in the "1 min irradiation" group (Group 2 = 99.8%) which was very close to the results of other experimental groups (99.9%). There were no significant differences among the groups.

Conclusions: PDT is as effective as conventional 5% NaOCl irrigation with regard to antimicrobial efficiency against *Enterococcus faecalis*.

P214

Management of Extruded Maxillary Incisors: Case Report

Sibel Koçak, Neslihan Yılmaz

Department of Endodontics, Faculty of Dentistry, Bulent Ecevit University

Aim: To present a successful treatment of extruded maxillary incisor teeth.

Materials and methods: A 22-year-old male patient referred to our clinic as a result of traumatic injury after a bicycle accident. The patient referred to the clinic 1 day after the accident. Panoramic and periapical radiographs were taken. During the intraoral examination, it was seen that the maxillary right central and lateral incisors were extruded. Following the local anesthesia, both teeth were carefully repositioned with finger compression. The teeth were splinted with orthodontic wire and composite. Root canal treatment was initiated after 15 days. Calcium hydroxide was placed as root canal medicament and was changed every 7 days for 2 weeks. The root canal treatment was completed with gutta-percha and root canal sealer. The patient was recalled for control after 3, 6 and 12 months.

Results: In clinical examination both teeth were symptom-free and in radiographic assessment, no resorption was observed on the root surfaces of both teeth.

P215

Pulp/Tooth Ratio in the Estimation of Age: A Study on Mandibular Premolars

Amitha Juanita Lewis

Department of Oral Pathology and Microbiology, Manipal College of Dental Sciences, Mangalore, Manipal University, Mangalore, Karnataka, India

Aim: The aim of the study was to use the radiographic method of age estimation by Cameriere et al. technique using pulp/tooth ratio of mandibular premolars on an Indian sample and derive population-specific equations for a more accurate estimation of age.

Materials and methods: This retrospective study was carried out using 200 orthopantomograms of patients (age between 20 and 70 years) of Indian origin from the records of Manipal College of Dental Sciences, Mangalore. Approval from the institutional ethics committee was obtained prior to commencing the study. The orthopantomograms were digitized with a scanner, and the images recorded on computer files. Following the technique proposed by Cameriere et al. the radiographic images were saved as high resolution JPEG files and imported to Photoshop Image processing software and Image J (NIH USA). The focus of the study was the mandibular first and second premolar. A lasso tool was used to delineate the external perimeter of the tooth as well as the pulpal perimeter and two variables obtained. Intra-observer variability was examined with a random sample of 25 orthopantomograms.

Linear regression equations were derived for predicting the age of the individuals separately for each gender.

Results: The pulp/tooth 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/tooth ratio is a valuable method in the estimation of age of subjects of Indian origin.

P216

Effects of Different Irrigating Solutions and Disinfection Methods on Push-Out Bond Strengths of Fiber Posts to Root Dentin

Hüseyin Ertaş

Department of Endodontics, Izmir Katip Celebi University, Izmir, Turkey

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) NaOCl 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 transversally sectioned to obtain four slices (1 mm thick) ($n = 16$). Push-out tests were conducted by applying a load at 0.5 mm/min, types of fracture failures were recorded, and data were analyzed with one-way ANOVA and Tukey 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, NaOCl, 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 NaOCl and EDTA combined caused lower bond strength than observed in the control group. However, supplementing this combination with CHX improved the post-dentin bond strengths; supplementing with PAD did not.

P217

Efficacy of Self-Adjusting File and Passive Ultrasonic Irrigation on Removing Calcium Hydroxide from the Root Canals

Fuat Ahmetoğlu¹, Neslihan Şimşek¹, Ali Keleş¹,

Mevlüt Sinan Ocak¹, Kürşat Er²

¹*Department of Endodontics, Faculty of Dentistry, Inönü University, Malatya, Turkey,* ²*Department of Endodontics, Faculty of Dentistry, Akdeniz University, Antalya, Turkey*

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 ($p < 0.05$). Intragroup 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.

P218

Healing of a Wide Periapical Lesion Using Calcium Hydroxide. A Follow Up Using CBCT

Gülsüm Çarkcı, Hatice Kübra Altınoluk

Department of Endodontics, Bezmialem Vakıf University, Istanbul, Turkey

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 Endodontology, 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 maxillary 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 mesio-buccal 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 Reportİsmail Özkoçak¹, Evrim Meriç Altun², Fatma Aytaç³, Nihat Akbulut⁴¹Department of Endodontics, University of Gaziosmanpaşa, Tokat, Turkey, ²Department of Endodontics, University of Ankara, Ankara, Turkey, ³Department of Restorative Dentistry, University of Gaziosmanpaşa, Tokat, Turkey, ⁴Department of Oral and Maxillofacial Surgery, University of Gaziosmanpaşa, Tokat, Turkey**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 therapy. 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 defect 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 ReportBegüm Büşra Özkoçak¹, İsmail Özkoçak², Fatma Aytaç³¹Department of Oral Diagnosis and Radiology, University of Gaziosmanpaşa, Tokat, Turkey, ²Department of Endodontics, University of Gaziosmanpaşa, Tokat, Turkey, ³Department of Restorative Dentistry, University of Gaziosmanpaşa, Tokat, Turkey**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 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 Reportİşıl Kaya Büyükbayram¹, Emre Aytugan², Şerife Özalp³¹Endodontist, Acibadem Hospital, Istanbul, Turkey, ²Department of Oral Diagnosis and Radiology, Faculty of Dentistry, Bezmialem University, Istanbul, Turkey, ³Department of Pedodontics, Faculty of Dentistry, Bezmialem University, Istanbul, Turkey**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

Ceren Feriha Uzuntaş, Berkan Çelikten, Derya Özen, Semra Sevimay

Department of Endodontics, Ankara University, Ankara, Turkey

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 Glidden burs no. 2 through no. 5 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 30 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 than MTA ($p < 0.05$). whereas no significant difference was detected between ERRMP and Biodentine ($p > 0.05$).

P223

Antimicrobial Efficacy of Diod and Nd:YAGG Lasers in Root Canals

Parla Meva Gerni¹, Banu Uygun Can², Tanju Kadir², Mahir Günday¹

¹Department of Endodontics, Faculty of Dentistry, Marmara University, Istanbul, Turkey, ²Department of Microbiology, Faculty of Dentistry, Marmara University, Istanbul, Turkey

Aim: The aim of this study is to evaluate the additive effect of Diod and Nd:YAGG laser on the antibacterial activity of 2.5% NaOCl against contaminated root canals with *Candida albicans*.

Materials and methods: This study was approved by the Research Ethics Committee of Marmara University, Istanbul, Turkey. Root canals of 30 human extracted teeth with single straight canals were used for this in vitro study. After preparation and sterilization, the specimens were inoculated with *Candida albicans* for 7 days at 37°C. The contaminated roots were divided into three experimental groups. In group 1, 10 teeth were irrigated with 5 ml 2.5% NaOCl for 2 min. In group 2, after 2.5% NaOCl irri-

gation, Diod laser at 1W output was performed for 4×10 s. In group 3, Nd:YAGG laser at 1.5 W output was performed for 4×10 s after irrigation with NaOCl. Intracanal sampling was done with paper points and the samples were plated to determine the CFU (colony forming units) count before and after disinfection procedure. Data were analyzed statistically using Kruskal-Wallis and Mann-Whitney U-tests.

Results: There was a significant reduction in the bacterial population after all treatments ($p < 0.01$). Group 3 had the lowest number of remaining microorganisms, and followed by group 2 and group 1. There was no statistical difference among the groups.

Conclusion: Both laser systems have a significant bactericidal effect when combined with 2.5% NaOCl irrigation in infected root canals. Nd:YAGG and Diod lasers might be possible supplements to existing protocols for root canal disinfection.

P224

Effect of Moisture on Push-Out Bond Strength of Resin and mta Based Sealers

Ali Erdemir¹, Ayce Unverdi Eldeniz², Merve Ozguven¹, Sefika Nur Akyuz¹, Ali Turkylmaz¹

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

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

Emre Bodrumlu¹, Elif Kalyoncuoğlu¹, Hakan Göktürk²¹Ondokuz Mayıs University Faculty of Dentistry, Department of Endodontics, Samsun, Turkey, ²Amasya Oral and Dental Health Centre, Amasya, Turkey

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 groups. The difference between MTAD, NaOCl and EDTA groups and 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

Merve Ozguven, Sefika Nur Akyuz, Ali Erdemir

Department of Endodontics, Kirikkale University, Kirikkale, Turkey

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 $\frac{1}{2}$ 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 \times 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 $\frac{1}{2}$ 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

Enver Alper Sinanoğlu¹, Dilek Helvacioğlu Yigit²¹Department of Oral and Maxillofacial Radiology, Faculty of Dentistry, Kocaeli University, Kocaeli, Turkey, ²Department of Endodontics, Faculty of Dentistry, Kocaeli University, Kocaeli, Turkey

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*

Blerim Kamberi¹, Ferit Koçani¹, Donika Bajrami¹,Miranda Stavileci¹, Shuhreta Omeragic²¹Department of Dental Pathology and Endodontics, University Dentistry Clinical Center of Kosovo, Prishtina, Kosovo,

²Department of Microbiology, Directory of Water High Quality, Prishtina, Kosovo

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 of 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.

P229

Endodontic Retreatment of Lower Premolars

Paula Perlea¹, Cristina Coralia Nistor¹, Marian Vladimir Constantinescu²

¹Department of Endodontics, Carol Davila University, Bucharest, Romania, ²Department of Prosthetic Dentistry, Carol Davila University, Bucharest, Romania

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 were 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 were 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 according to Weine and even cases with two roots. The CBCT can help visualize the endodontic pattern of those teeth.

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.

P230

Quality of Root-Canal Treatments Performed by Undergraduate Students in University of Marmara

Sema Sönmez, Burçin Arıcan, Emre İriboz, Dilek Erbay Türkaydın, Hesna Sazak Öveçoğlu

Department of Endodontics, Marmara University, Istanbul, Turkey

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 appropriate in 72.5% and inappropriate 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 appropriate, 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%.

P231

Comparison of Debris Removal Efficacies of Four Different Irrigation Techniques

Emre İriboz¹, Koral Bayraktar¹, Dilek Erbay Türkaydın¹, Bilge Tarçın², Hesna Sazak Öveçoğlu¹

¹Department of Endodontics, Marmara University, Istanbul, Turkey, ²Department of Restorative Dentistry, Marmara University, Istanbul, Turkey

Aim: The purpose of this study was to compare the debris removal effectiveness of EndoVac (EV), Passive Ultrasonic Irrigation (PUI), Self-Adjusting File (SAF), and needle irrigation (NI).

Materials and methods: Forty-two extracted single-rooted teeth were divided into four groups of 10 teeth each. Two teeth were left intact as negative control. The teeth were mounted in resin blocks and instrumented to an apical size of no. of 30. After standard irrigation protocols, the teeth were sectioned at 1 and 3 mm from the apex using a precise saw. The sectioned samples were observed under a stereomicroscope at $\times 128$ magnification and were digitally photographed. The amount of remaining debris was

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*

Burçin Arıcan¹, Tuna Kaplan¹, Emre İriboz¹, Salih Gümrü², Hesna Sazak Öveçoğlu¹

¹Department of Endodontics, Marmara University, Istanbul, Turkey, ²Department of Pharmacology, Marmara University, Istanbul, Turkey

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 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 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 diameter of the inhibition zone observed 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

Esin Özlek¹, Betül Özçopur¹, Siddık Keskin²

¹Department of Endodontics, Yuzuncu Yıl University, Van, Turkey, ²Department of Biostatistics, Yuzuncu Yıl University, Van, Turkey

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 (Bio-lase Technology, Inc, San Clement, CA), and group 4; %5,25 NaOCl + % 0.2 chitosan, 40-s Er,Cr: YSGG laser treatment (Bio-lase 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

Diana Berechet, Marius Bud, Lucia Timis, Sanda Cimpean, Ada Delean

Department of Conservative Odontology

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 our 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, χ^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.

P235

Root Canal Configuration of Maxillary Molars in a Turkish Population

Nermin Yönel Köse, Leman Özkan, Sıla Korun, Serap Çetiner, Kaan Orhan

Department of Pediatric Dentistry, Near East University, Nicosia, North Cyprus

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 mesio-buccal/distobuccal and palatal 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 palatal 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 powerful tool for examination of this region with capable of making measurements and 3D representations with less ionizing radiation.

P236

Bony Defects Healing Using Grafting with GTR After Endosurgery

Mohamed Nageh¹, Medhat Kataia², Geraldine Ahmed², Gihan Omar³

¹*Department of Endodontics, Ministry of Health, Cairo, Egypt,*

²*Department of Endodontics, Cairo University, Cairo, Egypt,*

³*Department of Oral Radiology, Cairo University, Cairo, Egypt*

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.

P237

Bactericidal Effect of Different Power Parameters of KTP Laser Against *Enterococcus faecalis*

Dilara Arslan¹, Alper Kuştarıcı², Cem Çelik³

¹*Department of Endodontics, Bezmialem University, Istanbul,*

Turkey, ²*Department of Endodontics, Akdeniz University,*

Antalya, Turkey, ³*Department of Microbiology, Cumhuriyet University, Sivas, Turkey*

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 μ 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 and data were analyzed statistically using Kruskal–Wallis and Tukey's tests.

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

Jovan Cabunac, Zeljka Cabunac, Vesna Markovic
Dental Practice Dr Jovan Cabunac, Belgrade, Serbia

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

Zeljka Cabunac, Jovan Cabunac, Vesna Markovic
Dental Practice Dr Jovan Cabunac, Belgrade, Serbia

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 of form (91.5%), 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

Oya Ulu¹, Isıl Karaduman², Onur Öznelçin³, Can Dörter²

¹Department of Restorative Dentistry, Istanbul Aydin University, Istanbul, Turkey, ²Department of Restorative Dentistry, Istanbul University, Istanbul, Turkey, ³Med. Dent., Istanbul, Turkey

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

Marija Abdovic, Slaven Abdovic

Department of Dentistry, JU Dom zdravlja Zenica, Zenica, Bosnia and Herzegovina

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

Ahu Acar¹, Kadir Beycan¹, Melis Akbayar², Kemal Naci Köse², Coşkun Yıldız³, Bahar Kuru², Yasemin Özkan³

¹Department of Orthodontics, Marmara University, Istanbul, Turkey, ²Department of Periodontology, Marmara University, Istanbul, Turkey, ³Department of Prosthodontics, Marmara University, Istanbul, Turkey

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 fiberotomy 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 all an 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 fiberotomy 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

Ayaka Yoshida, Fumihiko Yoshino, Yojiro Maehata, Chihiro Miyamoto, Shunsuke Takahashi, Satoko Wada Takahashi, Masaichi Chang Il Lee

Division of Pharmacology, Department of Clinical Care Medicine, Kanagawa Dental University, Kanagawa, Japan

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-sulphophenyl)-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 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 statically 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

Aslı Akın¹, Suna Toksavul², Muhittin Toman²

¹*Oral and Teeth Health Public Center, Eskişehir, Turkey,*

²*Department of Prosthetic Dentistry, Ege University*

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 with Mann–Whitney *U* and student *t*-test ($\alpha = 0.05$). 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 $210.57 \pm 31.05 \mu\text{m}$ 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 Radioisotopic Methods

Sofia Laranjo, Margarida Abrantes, Maria Filomena Botelho, João Casalta, Anabela Paula, Carlos Miguel Marto, Diana Rebelo, Pedro Ambrósio, Manuel Marques Ferreira, Eunice Carrilho
Faculty of Medicine, University of Coimbra, Coimbra, Portugal

Aim: Evaluate the microleakage of dental restorations using OptibondTM XTR (Kerr). The null hypothesis was that the type adhe-

sive 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 ^{99m}Tc-Perthane-tate. The radioactivity was counted. The nonparametric Kruskal–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.

P246

Durability and Bond Strength of One and Two-Parts Silanes

Afshin Nateghifard¹, Amir Ghasemi², Hasan Torabzadeh²,

Sina Seyyed Abbas Zadeh³, Ardalan Nateghifard⁴

¹*School of Dentistry, Tehran University of Medical Sciences, Tehran, Iran,* ²*Department of Restorative Dentistry, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran,* ³*Dental Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran,* ⁴*San Jose State University, San Jose, CA, USA*

Aim: The purpose of the present study is to assess the effect of commonly used and experimental one and two-part silane coupling agents on the microshear bond strength of composite to porcelain after 24 h and 6 months.

Materials and methods: One hundred and twenty VMK95 porcelain blocks were fabricated in similar laboratory conditions, and were polished by silicon carbide papers and ultrasonically cleaned. One-part (Porcelain Primer; Bisco, USA) or two-part (Bis-Silane; Bisco, USA) silane coupling agents and experimental one or two-part silane coupling agents were applied on the surfaces of samples. Micro cylinders of composite (3M; ESPA, USA) were bonded to blocks after 24 h and 6 months of water storage. The specimens were subjected to microshear bond strength device (Microtensile tester; Bisco). Repeated measure ANOVA and Tukey multiple comparison tests were used to analyze the data.

Results: Twenty-four hours after silane application, the mean microshear bond strengths were 24.03, 21.64, 21.19 and 10.18 MPa using commercial two-part, experimental one-part, experimental

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

Alev Özsoy¹, Uğur Erdemir², Taner Yücel²

¹Department of Restorative Dentistry, School of Dentistry, İstanbul Medipol University, İstanbul, Turkey, ²Department of Restorative Dentistry, School of Dentistry, İstanbul University, İstanbul, Turkey

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 μ TBS 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 μ TBS when compared to other groups ($p < 0.0001$). μ TBS 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 μ TBS to caries affected dentin were lower than sound dentin. Ozone application reduced the μ TBS both caries and sound teeth. Ethanol application showed good results both caries and sound groups.

P248

Microleakage of Composite Restorations in Class V Cavities Etching by Er-YAG Laser

Nazmiye Dönmez¹, Şeyda Hergüner Siso¹, Aslıhan Üşümez²

¹Department of Operative Dentistry, Faculty of Dentistry, Bezmialem Vakıf University, İstanbul, Turkey, ²Department of Prosthodontics, Faculty of Dentistry, Bezmialem Vakıf University, İstanbul, Turkey

Aim: The aim of this study was to investigate the effect of different Er:YAG laser pulse modes on microleakage of composite resin restorations using a self-etch adhesive systems.

Materials and methods: Standard class V adhesive cavities were prepared on the buccal and lingual surfaces of sound human premolar teeth. The cervical cavity margins were below the CEJ. The teeth were randomly divided into three groups: Group 1; acid etching, Group 2; Er:YAG laser etching with MSP mode, Group 3: Er:YAG laser etching with QSP mode. Cavities were restored with a hybrid composite (Clearfil Majesty Posterior A3.5 Kuraray). After thermocycling for 1000 cycles between 5 and 55°C, the specimens were stained with 0.5% aqueous basic fuchsin dye and sectioned bucco-lingually. Dye penetration was then scored. The data were analyzed using the Kruskal-Wallis and Mann-Whitney U-tests with Bonferroni correction. The Wilcoxon signed ranks test was used to compare occlusal and gingival scores.

Results: Even though no statistically significant differences were found between any of the groups ($p > 0.05$), the cavities etched with Er:YAG laser QSP mode showed less microleakage and also there were no significant differences between the microleakage at the dentin margins and the enamel margins in all groups ($P > 0.05$).

P249

Compressive Strength, Fluoride Release and Recharge of Giomer

Sheikh Muhammad Abdul Quader¹, Mohammad Shamsul Alam²

¹Department of Conservative Dentistry & Endodontics, Update Dental College, Dhaka, Bangladesh, ²Department of Conservative Dentistry & Endodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Current restorative materials with high fluoride release generally have lower mechanical properties. Therefore they may not be as durable clinically as lower fluoride release materials, particularly in load bearing areas. The aim of the present study is to explore the fluoride release and recharging ability as well as its compressive strength of the newly developed material called Giomer. The name Giomer is a hybrid of the words Glass Ionomer and Composite. Giomer contain a revolutionary PRG (Pre Reacted Glass) filler technology. They have properties of both conventional Glass Ionomer (fluoride release and recharge) and resin Composite (excellent esthetics, easy polishability and biocompatibility).

Materials and methods: Seven disk specimens of Giomer, Compomer and Glass Ionomer restorative materials were prepared for measurement of fluoride release and recharge using Ion Chromatography (IC) anion analyzer machine. Another seven disk specimens of Giomer, Compomer and Composite restorative materials

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.

P250

Microtensile Bond Strength of a Self-Adhesive Resin Cement to Dentin After Different Pretreatment Protocols

Tansu Erakman, Ufuk Hasanreisoglu, Sadullah Üçtaşlı
Department of Prosthodontics, Faculty of Dentistry, Ankara University, Turkey

Aim: To evaluate the effect of different pretreatment protocols to dentin on the microtensile bond strength (μ TBS) of a self-adhesive resin cement with and without simulated hydrostatic pulpal pressure (PP).

Materials and methods: Prefabricated composite blocks were bonded to mid-coronal dentin with one of the following resin-based cements and/or bonding agent combinations; G 1: RelyX Unicem (RU), G2: RelyX Unicem + total-etch Adper Single Bond Plus (RUSB), G3: RelyX Unicem + self-etch Clearfil SE Bond (RUSE). Additionally, conventional adhesive cementation techniques including total-etch RelyX ARC + Adper Single Bond Plus (RXSB)(G4) and self-etch Panavia F 2.0 + Clearfil SE Bond (PFSE) (G5) were evaluated. Each test group was further subdivided into two groups according to the different experimental conditions as those stored in water under either 0 cm H₂O PP, or 20 cm H₂O PP following the bonding procedure. After μ TBS testing, the data were statistically analyzed using two-way ANOVA and Least Square Distance tests ($p < 0.05$).

Results: Pretreatment of dentin with SB or SE adhesive system significantly increased the μ TBS of RU to dentin in the absence of PP ($p < 0.05$). Application of PP reduced the bond strength values of all the treatment protocols eliminating the differences between those of RU, RUSB and RUSE ($p < 0.05$).

Conclusion: Pretreatment of dentin surface with total-etch (SB) or self-etch (SE) adhesive system did not improve the μ TBS of self-adhesive cement (RU) to dentin considering simulated clinical conditions.

P251

Marginal Sealing of Class V Resin Composite Restorations with Low-Viscosity Resins

Işıl Bayrak, Nazmiye Dönmez, Şeyda Hergüner Siso,
Deniz Selin Saltık

Department of Restorative Dentistry, Bezmialem Vakif University, Istanbul, Turkey

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-BiscoverLV) 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 under 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.

P252

Microleakage of Class V Cavities Restored with Novel Glass-Ionomer System

Nazmiye Dönmez, Işıl Bayrak, Deniz Selin Saltık,
Şeyda Hergüner Siso

Department of Restorative Dentistry, Bezmialem Vakif University, Istanbul, Turkey

Objectives: Novel glass-ionomer system introduced is claimed to be used as long-term restorative material in Class I, II, V cavities. Purposes of this in vitro study were to comparatively investigate microleakage of class V cavities filled with glass-ionomer system, compomer or resin composite; and to evaluate if application of bonding-agent before inserting restorative material affects microleakage of Class V glass-ionomer 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 glass-ionomer system (Group A-Equia), bonded glass-ionomer system (Group B-Equia), compomer (Group C-Dyract) or resin composite (Group D-Filtek Z550) 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.

P253

Effect of Resin Coating Against Acidic Challenge on Eroded Enamel

Ayşe Dünder¹, Abdülkadir Şengün²

¹Department of Restorative Dentistry, Abant İzzet Baysal University, Bolu Turkey, ²Department of Restorative Dentistry, University of Kırıkkale, Kırıkkale, Turkey

Materials and methods: The crowns of extracted 75 bovine incisors were embedded with acrylic resin and enamel surface was flattened by abrasive papers. The surface of each sample was covered with adhesive tape except for an enamel window (2 × 3 mm). After in vitro pellicle formation, each erosion cycle involved a 1 h exposure to 1.0% w/v citric acid, pH 3.2, followed by a 60 min immersion in artificial saliva. The samples were randomly allocated to five groups (n = 15/per group), as follows: Positive control: 1% citric acid (pH 3.2), Negative control: Distilled water, BC: BisCover LV, OG: OptiGuard, Icon: Icon Smooth Surface. The resin materials were applied to the eroded surface according to manufacturer's instructions. After tape was removed, surface roughness, enamel loss and surface analyze were determined using stylus profilometer, SEM and AFM. The data were analyzed with Kruskal-Wallis and Mann-Whitney U-test with Bonferroni correction.

Results: Amongst groups, erosive wear occurred in only positive control group. All resin materials protect enamel surface from citric acid but Icon showed significantly the best performance on prevention of dental erosion. The surface roughness decreased in only negative control group.

Conclusion: Resin coating of eroded enamel effectively prevented further damage. Application of Icon was considered as best method on prevention of erosion. It can be advised that the resin surfaces were polished with extra-fine abrasive papers to minimize the roughness of the surface in resin groups.

P254

Physico-Chemical Assessment of Mechanically Degraded Interface of Biodentine Base

Heba Ahmed Shalaby¹, Amal K. Sakr², Mones M. Abdelhameed³, Monazah G. Khafagi⁴, Mohamed F. Shaban⁵

¹Dental Biomaterial Department, Faculty of Oral and Dental Medicine, Nahda University, Beni Sweif, Egypt, ²Operative Dentistry, Faculty of Dentistry, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia, ³Operative Dentistry Department, Faculty of Oral and Dental Surgery, Misr University for Science and Technology, Cairo, Egypt, ⁴Departments of Spectroscopy, Physics Division, National Research Center, Cairo, Egypt, ⁵Nanophotonic and Applications (NPA) Lab, Department of Physics, Faculty of Science, Beni-Suef University, Egypt

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) were 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.

P255

One-year Clinical Evaluation of Class 5 Composite Restorations

Duygu Tuncer, Çiğdem Çelik, Kıvanç Yamanel, Neslihan Arhun
Department of Restorative Dentistry, Baskent University, Ankara, Turkey

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 composite 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

Işıl Bayrak¹, Güneç Saygı², Pınar Karakoç², Murat Tiryaki²

¹Department of Restorative Dentistry, Bezmialem Vakıf University, Istanbul, Turkey, ²Department of Restorative Dentistry, Istanbul University, Istanbul, Turkey

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 (8×2 mm; $n = 7$) were prepared from nano-hybrid resin composite (Filtek Z550) of shade A2 and light-cured according to one of following modes: Halojen (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*a*b 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.

P257

Shear Bond Strength of Orthodontic Brackets to Fluorosed Enamel

Mónica Mendes¹, Pedro Mesquita¹, Sofia Arantes Oliveira², Jaime Portugal²

¹Faculty of Dental Medicine, University of Oporto, Oporto, Portugal, ²Faculty of Dental Medicine, University of Lisbon, Lisbon, Portugal

Aim: To evaluate the influence of etching time on shear bond strength (SBS) of orthodontic brackets to fluorosed enamel.

Materials and methods: Sixteen healthy and 32 fluorosed human maxillary central incisors were used ($n = 16$). Healthy teeth were assigned to group 1 and fluorosed teeth were randomly allocated in groups 2 and 3. Bucal enamel was etched with 35% phosphoric acid for 30 s (groups 1 and 2) or for 60-s (group 3) and metal brackets were bonded with light-activated composite resin (Transbond XT, 3M Unitek – 1200 mW/cm² – 10-s). Specimens were stored in distilled water (37°C) for 72 h, thermocycled (500 cycles, 5–55°C) and SBS tests were performed using an universal testing machine (Instron, 1 KN, 1 mm/min). Bond failure modes were classified with a modified Adhesive Remnant Index (ARI). SBS data were analysed with one-way ANOVA followed by Tukey post-hoc tests ($p < 0.05$). Kruskal-Wallis and Mann-Whitney non-parametric tests were used to analyse the failure mode ($p < 0.05$).

Results: No statistically significant differences were found between SBS of the two groups with fluorosis ($p = 0.763$). But both groups with fluorosed teeth yielded SBS values significantly lower than the group with healthy teeth ($p < 0.05$). Failure mode of the groups with fluorosis was significantly different than non-fluorosed group ($p < 0.05$).

Conclusion: Bond strength of brackets to fluorosed teeth was lower than to healthy teeth and increasing etching time to 60-s was not enough to achieve similar results to those obtained in the healthy teeth with 30-s conditioning.

Acknowledgement: Work developed at UICOB, FCT-R&D unit n°4062.

P258

Preparation of Ciprofloxacin Nanoparticles for Local Drug Delivery in Periodontology

Solmaz Eskandarion¹, Rasoul Dinarvand², Mehdi Esfandyari²

¹Dental Materials Department, Dental School, Shahid Beheshti University of Medical Sciences, ²Pharmaceutics Department, Pharmacy School, Tehran University of Medical Sciences

Aim or purpose: Periodontal diseases are one of the most important problems in dentistry that can result in teeth lost. Therapy is aimed primarily at reduction of etiologic factors to reduce inflammation. The objective of this work was to improve the antibacterial effect with preparing the poly lactic-co glycolic acid (PLGA) nanoparticles (NPs) containing ciprofloxacin, appropriate antibiotic against periodontal infections. Such NPs could be used as a local delivery system and decreasing the side effects of systemic administration of antibiotics.

Materials and methods: The NPs were prepared using double solvent evaporation emulsion method. The properties of resulted NPs were analyzed. Ciprofloxacin NPs were spherical. The average par-

ticle size of ciprofloxacin NPs was 376 ± 9 nm. The entrapment efficiency (E.E) and drug loading (D.L) of ciprofloxacin NPs were $10.91 \pm 0.68\%$ and $1.07 \pm 0.03\%$, respectively. Release studies indicated the initial burst release and following with slow release for prepared NPs that is adapted with the periodontal therapy.

Results: The antimicrobial activity of NPs was compared with that of the free drug by well diffusion method and broth macrodilution method using *Aggregatibacter actinomycetocomitans* (A. a) ATCC 43718. The inhibition zone of ciprofloxacin loaded NPs (8.4 mm) were greater than that of free ciprofloxacin (2.7 mm). The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of antibiotics NPs was two times lower than free antibiotics.

Conclusions: Totally, the Ciprofloxacin NPs prepared in this study showed higher antibacterial activity compared to free drug. So, antibiotic NPs as a local therapy may act more effectively than systemic antibiotic therapy.

P259

Influence of Gingival Margin on the Microleakage of Bulk-Fill Composites

Nihan Gönülol, Biliñ Bulucu, Simin Özböler

Department of Restorative Dentistry, Ondokuz Mayıs University, Samsun, Turkey

Aim: To evaluate the influence of 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, $5-55^{\circ}\text{C}$) 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

Merve Akçay¹, Hüseyin Ertaş², Ebru Küçükyılmaz¹, Elif Tarım Ertaş³

¹Department of Pediatric Dentistry, Izmir Katip Celebi University, Izmir, Turkey, ²Department of Endodontics, Izmir Katip Celebi University, Izmir, Turkey, ³Department of Oral and Maxillofacial Radiology, Izmir Katip Celebi University, Izmir, Turkey

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 (2.5 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?

Vasiliki Maseli¹, Maria M. Karabela², Konstantinos Kyritsis³, Dimitrios Tsivoulas⁴, Vasileios Prantsidis⁵

¹Department of Cariology, Restorative Sciences and Endodontics, The University of Michigan, School of Dentistry, Ann Arbor, MI, USA, ²Laboratory of Organic Chemical Technology, Department of Chemistry, Aristotle University of Thessaloniki, Greece, ³DMP Ltd, Department of Research and Development, Markopoulo, Greece, ⁴School of Materials, The University of Manchester, Manchester, UK, ⁵College of Engineering, Chemical Engineering Department, Swansea University, Wales, UK

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 (DMP). 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

Mehmet Burçin Pişkin¹, Aysel Kanturk Figen², Pinar Yılmaz Atalı³
¹Department of Bioengineering, Yıldız Technical University, Istanbul, Turkey, ²Department of Chemical Engineering, Yıldız Technical University, Istanbul, Turkey, ³Department of Operative Dentistry, Marmara University, Istanbul, Turkey

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 was 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 magnificant and particle size analysis were done under ×5000 magnificant.

Results: Nanohybrid composite showed the smoothest surface and the silorane showed the roughest surface. The average particle size of and the biggest filler are: SDR 1.61 and 2.27 µm; Xtrabase 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; Siloran 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

Aysel Kanturk Figen¹, Pinar Yılmaz Atalı², Mehmet Burçin Pişkin³
¹Department of Chemical Engineering, Yıldız Technical University, Istanbul, Turkey, ²Department of Operative Dentistry, Marmara University, Istanbul, Turkey, ³Department of Bioengineering, Yıldız Technical University, Istanbul, Turkey

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 investigated 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 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 sufficient polymerization.

P264

Microhardness of New Generation Posterior Composite Materials: BulkFill, Nanohybrid, Silorane

Pinar Yılmaz Atalı¹, Mehmet Burçin Pişkin², Aysel Kanturk Figen³
¹Department of Operative Dentistry, Marmara University, Istanbul, Turkey, ²Department of Bioengineering, Yıldız Technical University, Istanbul, Turkey, ³Department of Chemical Engineering, Yıldız Technical University, Istanbul, Turkey

Aim: The aim of this study is to compare the Vickers microhardness (VHN) of Xtrafill (Voco), Quixfill (Dentsply), Xtrabase (Voco), SDR (Dentsply) as bulkfills; nanohybrid as Grandio (Voco);and Filtek Silorane (3M, ESPE) after 1st, 7th and 14th days of distilled water storage.

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 day.

Results: The results were analyzed with one way ANOVA and Tukey HSD test p-value <0.05 was considered significant. SDR has the lowest VHN at 24 h (21.5 ± 1.14) and 14th day

(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

Nuran Noyan Ozyoney, Dilek Tagtekin, Funda Yanikoglu, Sertaç Peker

Department of Restorative Dentistry Marmara University, Istanbul, Turkey

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 HSD 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

Maria Antonela Beldiman¹, Oana Tanculescu¹, Bogdan Leitoiu², Raluca Maria Mocanu¹, Corina Cristescu¹, Dan Nicolae Bosinceanu¹

¹Department of Prosthetics, Dental Technology and Dental Materials, Faculty of Dentistry, University of Medicine and Pharmacy, Iasi, Romania, ²Department of Mechanical Engineering, Technical University, Iasi, Romania

Aim: Usually, after premature loss of temporary teeth, are applied space maintainers, so it is important to know the mechanical pro-

prieties 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 5kN, 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

Dilara Özenay Dergin, Ahu Muesser Durhan, Burak Kitiki, Didem Kural, Ilknur Tanboga

Department of Pedodontics, Marmara University, Istanbul, Turkey

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 imagining 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 Trated Teeth in Children

Ümit Candan¹, Mehmet Sinan Evcil¹, Nazan Ersin², Ece Turan², Fahinur Ertuğrul²

¹Izmir Dental Hospital, Izmir, Turkey, ²Department of Pediatric Dentistry, Ege University, Izmir, Turkey

Purpose: 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 fullfills 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

Kenan Canteğin¹, Hüsnüye Gümüş¹, Hakan Şahin², Yasemin Altuner Torun³

¹Department of Pediatric Dentistry, Faculty of Dentistry, Erciyes University, Kayseri, Turkey, ²Department of Pediatric Dentistry, Faculty of Dentistry, İzzet Baysal University, Bolu, Turkey,

³Division of Pediatric Hematology, Department of Pediatrics, Kayseri Education and Research Hospital, Kayseri, Turkey

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

Tuğba Bezgin, Duygu Öcal, Ece Karaahmetli, Levent Özer
Department of Pediatric Dentistry, Ankara University, Ankara, Turkey

Aim: The study aimed to investigate the impact of different restorative techniques on the micro-tensile bond strength (μ TBS) 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 μ TBS of materials. Specimens were randomly divided into three groups for restoration: Group 1, compomer (Glasiosite, VOCO GmbH, Cuxhaven, Germany) filling alone; Group 2, flowable compomer (Twinky Star Flow, VOCO GmbH, Cuxhaven, Germany) lining/pre-cured and overlaying compomer; and Group 3, flowable compomer lining/co-cured with overlaying compomer. Specimens were stored in distilled water at 37°C for 24 h and tested for μ TBS (1 mm/min) using a micro-tensile testing machine (Micro Tensile Tester, T-61010Ki, Bisco, Schaumburg, USA). Failure modes were determined under a stereomicroscope. μ TBS 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 3, 53.3% in Group 2).

Conclusion: Flowable compomer with different restorative techniques showed similar bond strength to dentin with compomer.

P271

Postoperative Discomforts in Children After Dental Rehabilitation Under General Anesthesia with Nasotracheal Intubation

Kenan Canteğin¹, Ebru Delikan¹, Seçil Çetin¹, Mustafa Denizhan Yıldırım²

¹Department of Pediatric Dentistry, Faculty of Dentistry, Erciyes University, Kayseri, Turkey, ²Department of Anesthesiology and Pediatric Dentistry, Faculty of Medicine and Dentistry, Erciyes University, Kayseri, Turkey

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

Eko Sri Yuni Astuti

Department of Pediatric Dentistry (Pedodontic), Faculty of Dentistry, Denpasar Mahasaraswati University, Bali, Indonesia

Aim: Mesiodens in primary or mixed dentition periode 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 brakect 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

Olçay Kopaç, Levent Demiriz

Department of Pedodontics, Bülent Ecevit University, Zonguldak, Turkey

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 reattached 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

Afnan Ibrahim Alsalem¹, Asma Aljoubar²

¹Dental Department, Prince Sultan Medical Military City, Riyadh, Kingdom of Saudi Arabia, ²Department of Pediatric Dentistry and Orthodontics, College of Dentistry, King Saud University, Saudi Arabia

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, syndactyly, and possibly oligodontia.

P275

Methods of Deciduous Dental Pulp Research

Zlatko Georgiev¹, Ivona Kovacevska², Ana Sotirovska Ivkova¹, Efska Zabokova Bilbilova¹, Cena Dimova²

¹Faculty of Stomatology, University St. Cyril & Methodius, Skopje, Macedonia, ²Faculty of Medicine, University Goce Delcev, Stip, Macedonia

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.

P276

Caries Management of Young Children Using Their Mother's Cariogram Data

Aya Sato, Sachie Warita, Yuma Ogawa, Madoka Kimura, Marie Enomoto, Ai Sakuma, Yukio Aso
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.

P277

Dental Students' Perception of Pre-Clinical Practice in Pediatric Dentistry

Sachie Warita Naoi¹, Hiroyuki Karibe¹, Tomomi Kawakami¹, Atsuko Suzuki², Yuko Umezu², Yoshimori Uchikawa²
¹*Department of Pediatric Dentistry, Nippon Dental University, Tokyo, Japan,* ²*Department of Pediatric Dentistry, Nippon Dental University Hospital, Tokyo, Japan*

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.

P278

Evaluation of Family Awareness on Bruxism in Mixed Dentition

Serhan Didinen, Neşe Akal
Department of Paediatric Dentistry, University of Gazi, Ankara, Turkey

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 diagnose 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, University 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

Basak Durmus¹, Ahu Durhan¹, Berna Gokkaya¹, Burak Kıtıkı¹, Funda Yanıkoglu², Betül Kargul¹

¹Department of Pediatric Dentistry, Marmara University, Istanbul, Turkey, ²Department of Restorative Dentistry, Marmara University, Istanbul, Turkey

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 (ΔQ ; $\Delta F \times A$; % $\times \text{mm}^2$), 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 Orotacheal Intubation for Dental Rehabilitation Under General Anesthesia in Children

Kenan Cantekin¹, Seçil Çetin¹, Ebru Delikan¹, Mustafa Denizhan Yıldırım²

¹Department of Pediatric Dentistry, Faculty of Dentistry, Erciyes University, Kayseri, Turkey, ²Department of Anesthesiology and Pediatric Dentistry, Faculty of Medicine and Dentistry, Erciyes University, Kayseri, Turkey

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 inpatient 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 agitation, sleepiness, pain, nausea and vomiting.

P281

Effects of Oxalate and Tri-Calcium Phosphate Gels on the Primary Teeth Dentin Permeability: A Pilot Study

K. Gökem Ulu Güzel, Zuhale Kırzioğlu

Department of Pediatric Dentistry, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey

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 ($\mu\text{l}/\text{min}$) under a constant pressure (50 cmH_2O) 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

Prevalance of Dental Anomalies in Turkish Population

Gamze Aren¹, Ceren Güney Tolgay¹, Tamer Erdem², Gülsüm Ak³, Özlem Filiz Bayar³, Taha Emre Köse², Gülhan Koyuncuoğlu¹

¹Department of Pediatric Dentistry, Istanbul University, Istanbul, Turkey, ²Department of Oral Radiology, Istanbul University, Istanbul, Turkey, ³Department of Oral and Maxillofacial Surgery, Istanbul University, Istanbul, Turkey

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

Eda Haznedaroğlu, Fatma Varol, Serhat Karaca, Ali Menteş
Department of Pediatric Dentistry, Marmara University, Istanbul, Turkey

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, Dents-

ply, 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-do behaviour 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

Multidiscipliner Treatment of an Immature Tooth with Cervical-Root Fracture: A Case Report

Sema Çelenk¹, Demet Süer Tümen², Behiye Bolgöl¹, Buket Ayna¹

¹Department of Pediatrics, Faculty of Dentistry, Dicle University, Diyarbakır, Turkey, ²Oral and Dental Health Center, Diyarbakır, Turkey

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 healthy 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

Teodora Nikolaeva Bolyarova Konova¹, Raya Georgieva

Grozdanova Uzunova², Gergana Petrova Micheva¹,

Maria Stoianova Dencheva Garova²

¹Department of Periodontology, Faculty of Dental Medicine, Medical University, Sofia, Bulgaria, ²Department of Oral and Imaging Diagnostics, Faculty of Dental Medicine, Medical University, Sofia, Bulgaria

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.

P286

Using of Photodynamic Therapy in Patients with Generalized Periodontitis

Aleksiy Pavlenko, Nataliya Savichuk, Viktoriia Peredrii

P.L. Shupik National Medical Academy of Post-Graduate Education

Background/Aims: Periodontitis is the disease of periodontal tissues which is being characterized by progressive destruction of bone tissue. Additional treatment using the photodynamic therapy (PDT) reduced periodontal gingival inflammation, decrease amount of pathogenic microorganisms.

Method: Thirty subjects 25–55 years old presenting periodontal pockets at least 5 mm deep in each quadrant received initial periodontal treatment. The study had a split-mouth design. The control side (SRP) only received scaling and planing (SRP), and the test side (SRP + PDT) was treated by both SRP and PDT. Clinical conditions were evaluated at day 0 and day 10 the bleeding on probing (BOP), probing pocket depth (PPD). The PDT using a photosensitizer a toluidine blue in a mode 30 s each periodontal pocket during 5 days.

Results: There was no statistically significant difference between test and control sites concerning clinical criteria (BOP, PD) at baseline. The difference between day 0 and day 10 was highly significant, statistical differences existed between test and control sites.

Average BOP value was initially 0.7 in both treatment and control sites. Both treatments modified the BOP ($p > 0.001$), but differences between groups were significantly different ($p > 0.05$).

The initial PD average was 4.5 mm (SD = 0.9) in the control and 4.6 (SD = 0.9) in the test sites. After treatment, PD changed to 3.8 mm (SD = 1.0) in the control and 2.4 mm (SD = 0.4) for the test sites. Both treatments demonstrated a decreased PPD ($p > 0.05$).

Conclusion: The results clearly show that both treatment modalities were effective in decreasing the values of the clinical parameters used to evaluate periodontitis.

P287

Clinical Effectiveness of Photodynamic Therapy in the Treatment of Chronic Periodontitis

Tuğçe Sümer, Leyla Kuru, Bahar Kuru

Department of Periodontology, Marmara University, Istanbul, Turkey

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

Dilek Gürbüz, Bahar Kuru, Başak Doğan

Department of Periodontology, Marmara University, Istanbul, Turkey

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

significantly decreased from 4.9 ± 0.6 to 3.4 ± 0.5 mm and CAL from 5.8 ± 1.2 to 5.2 ± 1.4 mm ($p < 0.05$). Moreover, the percentage of sites PD ≥ 7 mm reduced $25.7 \pm 11.0\%$ to $4.5 \pm 3.8\%$ ($p < 0.05$) and CAL ≥ 7 mm $39.8 \pm 17.2\%$ to $27.3 \pm 22.1\%$ ($p < 0.05$).

Conclusion: It can be concluded that non-surgical mechanical periodontal treatment and regular recall appointments of GAgP patients achieve significant clinical outcomes over 6 months.

P289

Isolated Gingival Recession Treatment with Laterally Positioned Flap Technique: Case Series

Ahmet Afşin Erbeyoğlu, Raif Alan, Gülşah Tatar,
İsmail Marakoğlu, Tamer Ataoğlu

Department of Periodontology, Selcuk University, Konya, Turkey

Aim: 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.

P290

The Effects of Er, Cr:YSGG Laser on Implant Osseointegration

Abdullah Seçkin Ertuğrul, Yasin Tekin, Alihan Bozoglan

Department of Periodontology, Faculty of Dentistry, Yuzuncu Yil University, Van, Turkey

Aim: Laser in periodontal treatment is basically non surgical, surgical, and is considered to be safe with its usage. The aim of the invention, is to compare the changes of the ISQ values between implants which have been implanted following the application of Er, Cr:YSGG laser into the implant cavities that has been formed with conventional methods during dental implant treatment (I-1)

and which have been implanted without the application of Er, Cr:YSGG laser (I-2) into the implant cavities.

Methods: Ten subjects and 20 implant have been included in our study. An additional method was not applied to the first one of the cavities and an implant was inserted. Er, Cr:YSGG laser has been applied to implant cavity and then said implanted were inserted. After the completion of the osseointegration processes of the implants, the ISQ values of the implants belonging to the subjects participating to the study have been re-measured.

Results: When the difference between the ISQ values following operation and following the completion of the osseointegration process are taken, it has been determined that the average ISQ value variance was 17.5 in the I-2 group and 11,18 in the I-1 group. It has been found out that the ISQ variance values in I-2 group were statistically meaningfully higher in comparison to the I-1 group.

Conclusion: The bone tissue regeneration being effected due to thermal and mechanical trauma occurring during the opening of implant cavities could have gone back to its prior state with the application of Er,Cr:YSGG laser.

P291

External Resorption in an Upper Central Incisor with an Associated Endodontic-Periodontic Lesion: A Case Report

Murat İnanc Cengiz, Sibel Koçak

Faculty of Dentistry, Bülent Ecevit University

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 buccal 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

Irina I. Zadorina¹, Ludmila A. Mozgovaya¹, Liliya P. Bykova², Anatoliy P. Godovalov³

¹Department of Therapeutic Dentistry, Acad. E.A. Wagner Perm State Medical Academy, Perm, Russia, ²Department of Microbiology and Virology, Acad. E.A. Wagner Perm State Medical Academy, Perm, Russia, ³Department of Immunology, Acad. E.A. Wagner Perm State Medical Academy, Perm, Russia

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. 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.

Results: Index group had 62% of cases with prevalence of staphylococci, 58% - of anaerobic microorganisms, mainly lactobacilli and peptococci, 50% - of streptococci. Aggravation of CAP was due to aggressive coccal flora and Neisseria or enterobacteria. "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, $p > 0.05$).

Conclusion: 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 antiinflammatory.

P293

First Experience with the New Type of a Bioactive Glass in the Regenerative Therapy of Posterior Teeth in Chronic Periodontitis

Radovan Slezak, Vladimira Paulusova

Department of Dentistry, Faculty of Medicine in Hradec Kralove, Charles University in Prague, Czech Republic

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 persistent 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

Elifcan Kivrak¹, Gülay Tüter¹, Bülent Kurtiş¹, Erdim Sertoğlu²

¹Department of Periodontology, Faculty of Dentistry, Gazi University, Ankara, Turkey, ²Department of Biochemistry, Gülhane Military Medical Academy, Ankara, Turkey

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 as 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

Nezahat Arzu Kayar¹, Nilgün Özlem Alptekin², Mustafa Cihat Avunduk³

¹Department of Periodontology, The Ministry Health of Turkey, Oral and Dental Health Center, Antalya/Turkey, ²Department of Periodontology, Faculty of Dentistry, Selcuk University, Konya, Turkey, ³Department of Pathology, Selcuk University School of Medicine, Meram, Konya, Turkey

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.

P296

Effects of Alpha-Lipoic Acid and Vitamin C on 8-hydroxydeoxyguanosine, Glutathione and Malondialdehyde Levels After Experimental Periodontitis in Rats

Oğuz Köse¹, Adem Kara², Taner Arabacı¹, Cenk Fatih Çanakçı¹, Seçkin Özkanlar³

¹Department of Periodontology, Faculty of Dentistry, Ataturk University, Erzurum, Turkey, ²Department of Histology and Embryology, Faculty of Veterinary Medicine, Ataturk University, Erzurum, Turkey, ³Department of Biochemistry, Faculty of Veterinary Medicine, Ataturk University, Erzurum, Turkey

Aim: The present study aimed to investigate effects of ALA and Vit-C substances on 8-hydroxydeoxyguanosine (8-OHdG), glutathione (GSH) and malondialdehyde (MDA) levels in experimental periodontitis in rats.

Methods: Thirty six Wistar albino male rats were randomly divided into four groups as follows: Control (C), experimental periodontitis induced by ligature group (PED), experimental periodontitis induced by ligature and treated with ALA (ALA) group, and experimental periodontitis induced by ligature and treated with ALA + Vit-C combination (ALA + Vit-C) group. Experimental periodontitis was stimulated by placing ligatures around the necks of teeth for 5 weeks. After ligature removal, PED group was given a single intra gastric dose of 1 ml saline, while ALA and ALA + Vit-C groups were treated with intra-gastric dose of 50 mg/kg of ALA and ALA + Vit-C for 15 days, respectively. Gingival tissues were obtained and 8-OHdG, GSH and MDA levels were determined in these tissue homogenates.

Results: The results showed statistically significant differences between the PED group and antioxidant treated groups in terms of 8-OHdG, MDA and GSH levels ($p < 0.05$). It was observed that combination of the Vit-C to the ALA treatment did not create

important differences at the results compared to ALA group ($p > 0.05$). These treatments exhibited regulatory effects on the local oxidant-antioxidant balance.

Conclusion: This study evidenced that ALA and Vit-C reduced the oxidative damage in the rats' periodontal tissue by restoring to antioxidants. These vitamins may propose as new therapeutic agents in the treatment of periodontal diseases.

P297

The Effects of the Essential Oil Mouthwash on Human-Beta-Defensin-3 Level

Abdullah Seçkin Ertuğrul, Emre Gürkan Eroğlu,

Hacer Şahin Aydınıyurt, Ahu Dikilitaş

Department of Periodontology, Dentistry Faculty, Yüzüncü Yıl University, Van, Turkey

Aim: Human beta-defensins (hBDs) are the peptides, have antimicrobial effects against for periodontal pathogens. The hBDs are found in oral mucosa, salivary glands and gingiva. Especially hBD-3 is an antimicrobial agent and can promote the proliferation of fibroblast. Chemical plaque control is the most commonly recommended means of oral hygiene after periodontal surgery. The essential oil antiseptic is a combination of the phenol-related essential oils, including thymol (0.060%), eucalyptol (0.091%), menthol (0.042%) and methyl-salicylate (0.064%) in a 26.9% hydroalcoholic vehicle. This study aimed review the effects of applied essential oil mouthwash (EOMW) after scaling root planning (SRP) on hBD-3 levels in gingival crevicular fluid.

Materials and methods: SRP + EOMW and SRP + sodium chloride are applied to 12 patients mouth have four quarter effected periodontitis. SRP + EOMW is applied one quarter of mouth of patients and the SRP + sodium chloride is applied the another quarter of mouth of the same patients. The level of hBD-3 examined before the treatment and after a month of the treatment by the Enzyme-Linked Immuno-Sorbent Assay.

Results: The research shown that after the treatment, the periodontal indexes are meanly decreased. However the decreased level of hBD-3 did not show a significant difference in term of SRP + EOMW between SRP + sodium chloride.

Conclusion: The decreased level of hBD-3 may be the reason of the killing effects of the EOMW on microorganism. EOMWs effects on periodontal diseases are needed to work harder to understand.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

P298

Do Other Ethnicities Have the Same Complete Denture Biometric-Guides as Caucasians?

Ammar A. Mustafa, Kais R. Abdulmajeed

Faculty of Dentistry, International Islamic University, Malaysia

Objectives: To compare the applicability of biometric guides used in clinical and lab procedures of complete denture construction on different ethnic origins.

Methodology: Three hundred volunteers from three different ethnic origins (Malay, Chinese and Indians) with age range from 20

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 six 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

Nurhan Polat Sagsoz, Nuran Yanıkoğlu, Hamza Ulu, Funda Bayındır
Prosthodontics Department, School of Dentistry, Atatürk University, Erzurum, Turkey

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 ($\Delta E: 7.28$) in coffee solution for 7 days.

P300

Shear Bond Strength of Veneering Ceramic to Zirconia Core After Different Surface Treatments

Ömer Kırmalı¹, Hakan Akın², Ali Kemal Özdemir²

¹*Department of Prosthodontics, Faculty of Dentistry, Akdeniz University, Antalya, Turkey,* ²*Department of Prosthodontics, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey*

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 SN; 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.

P301

Curing Efficiency of Resin Cement Under Monolithic Zirconia

Pınar Gültekin, Elif Pak Tunç, Volkan Turp, Değer Öngül, Burçin Karataşlı, Özgür Bultan
Department of Prosthodontics, Faculty of Dentistry, Istanbul University, Istanbul, Turkey

Purpose: Different translucency properties of zirconia materials may affect the light transmission through the material to activate resin cement curing under the restoration. The aim of this study was to evaluate the effect of zirconia material and thickness on curing efficiency of resin cements.

Materials and methods: Eight zirconia disc-shaped specimens (Everest ZS-Kavo and Prettau-Zirkonzahn) with 4 mm diameter and following thicknesses: 0.5, 1.0, 1.5, 2.5 mm were fabricated. Twelve dual-cure resin cement specimens with 4.0-mm diameter and 6.0-mm height were prepared in teflon molds covered with a slide and light activated through each zirconia disc group. Light

curing was performed for 20 s using a light emitting diode device with a power of 1200 mW/cm². Specimens were stored for 24 h in light-proof containers following light curing. Resin cement specimens were then embedded in acrylic, wet flattened with SiC and Vickers hardness measurements were taken using a microhardness tester with 50 g load for 15 s at three different depths for each specimen. Results were statistically analyzed with one-way ANOVA and Tukey HSD tests ($\alpha = 0.05$).

Results: A statistically significant increase in VHN (Vickers Hardness Number) value of the resin cement was detected with increasing translucency of the zirconia ($p < 0.05$). Increasing thickness caused significant decrease in curing efficiency ($p < 0.05$).

Conclusion: Curing efficiency of dual-cure resin cement is affected by the translucency and thickness of the zirconia materials tested.

P302

Effect of Low-Temperature Aging on Flexural Strength of Monolithic Zirconia

Deniz Şen, Pınar Gültekin, Nesrin Ceren

Department of Prosthodontics, Faculty of Dentistry, Istanbul University, Istanbul, Turkey

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 ($\alpha = 0.05$). 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.

P303

Fracture Resistance of Teeth Restored with One-Piece Milled Aesthetic Post-Core Systems

Zehra Çekirdek¹, Aygül Sevdâ Atalay²,
Begüm Akkayan Kesmezacar¹

¹Department of Prosthodontics, Istanbul University, Istanbul, Turkey, ²Department of Prosthodontics, Istanbul Aydın University, Istanbul, Turkey

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 standard post space preparations, post-core patterns were produced using autopolymerizing acrylic resin pattern and they were scanned. Scanned datas of each post-core models were transferred to the milling device and quartz fiber (RTD, St. Egrevé, France) and zirconia ceramic (Vita In-Ceram YZ Disc, Vita Zahnfabrik, Bad Säckingen, 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 unrepairable, 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.

P304

Effect of Surface Treatment of Copy Milled Zirconia Ceramic Restorations on Bonding to Resin Cement

Hanaa Mohammed Elshenawy¹, Mohammed Aly Rashad¹,
Gehan Abd Elhade Elnagar²

¹National Research Center, Cairo, Egypt, ²Faculty of Oral and Dental Medicine, Cairo University

Statement of the problem: Successful long-term bonding to zirconia ceramic remains a challenge, requiring special surface treatment methods. The methods used to increase micromechanical retention to silica based ceramics do not always produce the required roughness and bond strength to zirconia ceramics.

Objective: The present study was an attempt to improve the bond strength of zirconia-based ceramic restorations (Ice-zirconia-zirkonzahn) to resin cement.

Materials and methods: Twenty one zirconia discs received three different surface treatments: group 1- sandblasting with 110 μm aluminum oxide particles; group 2- silica coating (cojet system) and group 3- laser irradiation (CO_2 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 ($219.00 \pm 14.8 \mu\text{m}$); group 2 ($187.26 \pm 10.72041 \mu\text{m}$); group 3 ($262.11 \pm 31.675 \mu\text{m}$) (ANOVA and Newman-Keuls test; $p < 0.05$).

Also, all groups yielded statistically significantly different shear bond strength mean values: group 1 ($18.69 \pm 2.47 \text{ MPa}$); group 2 ($14.51 \pm 1.7 \text{ MPa}$); group 3 ($12.69 \pm 2.439 \text{ MPa}$) (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

Ahmet Serkan Oruc, Caner Öztürk, Fehmi Gönültaş

Department of Prosthodontics, Ankara University, Ankara, Turkey

Mandibular defects may result from congenital or developmental abnormalities, accidental trauma, or acquired disfigurements 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 mandibula with hemi-mandibular defect caused by tumor surgery in a 60 years-old man. Prosthetic rehabilitation was obtained with a partial denture with extracoral precision attachments.

P306

Complete Oral Rehabilitation with Overdenture Prosthesis of Four Young Sisters Suffering with Amelogenesis Imperfecta: A Rare Case

Nermin Demirkol¹, Fatih Sarı¹, Mehmet Bülbül¹, Mehmet Demirkol²

¹Department of Prosthetic, Gaziantep University, Gaziantep, Turkey, ²Department of Oral and Maxillofacial Surgery, Gaziantep University, Gaziantep, Turkey

Background: Amelogenesis imperfecta is a hereditary disease affecting the quality and quantity of enamel. Patients suffer from dental sensitivity, psychological problems and compromised esthetics.

These anomalies such as congenital tooth loss, anterior open-bite, calcification of pulp, dentin dysplasia, resorption of root and crown, hypercementosis 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 for the patients.

P307

Prosthetic Rehabilitation of an Edentulous Patient with Microstomia: A Clinical Report

Aysegül Köroğlu, Onur Şahin, Doğu Ömür Dede

Department of Prosthodontics, Faculty of Dentistry, Bulent Ecevit University, Zonguldak, Turkey

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

Kazim Serhan Aksit¹, Yasar Nakipoglu², Gamze Mandalı¹, Gulsen Gunel², Bulent Guler², Aysegul Yurdakos¹

¹Department of Prosthodontics, Private Provincial Administration of Istanbul, Oral and Dental Diseases Hospital, Istanbul, Turkey,

²Department of Medical Microbiology, Faculty of Istanbul Medicine, Istanbul University, Istanbul, Turkey

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 alkali peroxide type cleaning denture effervescent tablets (Fittydent, Corega tabs, Protefix) 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 Protefix 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%), Protefix 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

Ece Tamaç, Suna Toksavul, Muhittin Toman

Department of Prosthetic Dentistry, Ege University, Izmir, Turkey

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 ($\alpha = 0.05$).

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 265.73, 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

Kujtim Shala, Linda Dula, Enis Ahmedi, Zana Lila Krasniqi, Teuta Bicaj, Teuta Pustina Krasniqi

Department of Prosthetic Dentistry, University Dentistry Clinical Center of Kosova

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

clasp-retained and sixteenth were RPDs with attachments. There were 28 females and 36 males, aged between 34 and 79 years. The data's were collected from survey questionnaire, from RPDs wearers, fitted in University Dentistry Clinical Center, Prishtina, Kosova. Patients graded their satisfaction with their RPDs in total and then graded retention, chewing ability, aesthetics, while wearing dentures by using a scale 1–4. The level of RPDs acceptance was classified as “excellent,” “good,” “medium” and “bad.” RPDs success was graded in three categories based on function and condition: complete success, partial success and failure.

Results: According to denture design of RPD's with Fisher exact test we confirmed statistically significant difference ($p = 0.008$) of patient's success of RPD's with or without attachment. Retention, chewing ability, aesthetics proved no statistically significant difference with χ^2 test of patient's satisfaction of RPD's with or without attachment.

Conclusion: Oral rehabilitation with RPDs was considered satisfactory after 5 years of use by most of patients (Cosme DC et al 2006). Patients are generally satisfied more with RPDs with attachment based on level of retention, chewing ability, aesthetics

P311

Dental Etiology Triggering Pressure Dermographism: A Case report

Simge Taşar, Gökçe Meriç, Selim Günsoy,
Mutahhar Muhammed Ulusoy

Department of Prosthodontics, Faculty of Dentistry, Near East University, Lefkoşa, Turkish Republic of Northern Cyprus

Introduction: Prothesis 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 dermographism developed after dental procedure. Pressure dermographism is a form of physical urticaria.

The present article described an unique case of pressure dermographism 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.

P312

Surface Roughness of Two Different Non- Precious Dental Alloy

Evşen Tamam¹, Fehmi Gönüldaş²

¹Department of Prosthodontics, Faculty of Dentistry, Gazi University, Ankara, Türkiye, ²Department of Prosthodontics, Faculty of Dentistry, Ankara University, Ankara, Türkiye

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 (Wiroloy®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.

P313

Impact of Frenulum Height on Strains in Maxillary Denture Bases

Altug Çilingir, Onur Geçkili, Gökçen Ates, Hakan Bilhan
Department of Prosthodontics, Istanbul University, Istanbul, Turkey

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 regio.

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

Seda Şanlı¹, Mine Dündar Çömlekoğlu², Erhan Çömlekoğlu², Tijen Pamir³, Brian W. Darvell⁴, Mehmet Sonugelen²

¹Bahçesaray Public Hospital, Van, Turkey, ²Department of Prosthodontics, Ege University, İzmir, Turkey, ³Department of Restorative Dentistry, Ege University, İzmir, Turkey, ⁴Department of Bioclinical Sciences, Kuwait University, Safat, Kuwait

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) ($2.0 \times 5.0 \times 25 \text{ mm}^3$) were prepared for four-point (quarter-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 (Sb), 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.

P315

Use of Trisected Molar as Abutment Tooth for Fixed Bridge

Özlem Çölgeçen, Ahmet Keski

Department of Prosthodontics, İzmir Katip Celebi University, İzmir, Turkey

Introduction: Treatment of the furcation involved molars presents the dentist with a challenging dilemma.

Case: This study presents a case report and 4 years follow up of the restoration of a furcation involved maxillary molar after trisection treatment as an abutment tooth for fixed bridge. A 42 years old patient had missing tooth 15, grade III furcation defect involved tooth 16 and previously prepared tooth 14. The tooth 16 was terminal tooth of the right maxillary dental arc. Radiographic examination showed adequate bone support around each roots. It was decided to apply trisection treatment on tooth 16, in order to use of it to support fixed bridge. After trisection treatment was performed, trisected root parts were prepared parallel to each other and tooth 14 for obtaining one insertion path of the restoration. To make easily accessible areas to home care instruments by the patient, trisected parts covered separately with thin metal alloy in furcation area and the parts were combined at near to occlusal. With this modified fixed bridge, tooth 16 was both became cleanable three way access and used as an abutment for a metal-ceramic bridge. Thanks to this conservative approach, patient didn't have to use removable denture or have implants. After 4 years follow up, there was not any clinical or radiographic problem.

Conclusion: As a conclusion, furcation involved molars can be used as abutment for fixed bridge after trisection treatment and it can be reduce to need of removable dentures and implants.

P316

Adaptation of Titanium Copings Fabricated by Electron Beam Melting

Huda Al Shehri¹, Wahyudin Seyam², Khalid Al Wazzan¹, Abdulrahman Al Ahmary²

¹Department of Prosthodontics, College of Dentistry, King Saud University, Riyadh, Saudi Arabia, ²Department of Industrial Engineering, College of Engineering, King Saud University, Riyadh, Saudi Arabia

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 mm^3) followed by cast and milled copings (10.29 and

9.31 mm³ respectively) while cast copings had the highest mean marginal gap volume (1.46 mm³) followed by EBM and milled copings (0.87 and 0.37 mm³), respectively ($p < 0.05$). VMD values were 165.71, 95.1 and 65.31 μm for cast, EBM and milled copings, respectively.

Conclusion: EBM copings had an acceptable marginal gap but significantly the highest volumetric internal gaps compared to milled or cast copings. While Milled copings showed least volumetric and VMD gap measurements.

P317

A Clinical Comparison of Cordless and Conventional Displacement Systems Regarding Clinical Performance and Impression Quality

Özlem Acar¹, Selim Erkut¹, Tuncer Burak Özcelik², Erdem Özdemir³, Mehtap Akcil⁴

¹Department of Prosthodontics, Baskent University, Ankara, Turkey, ²School of Dentistry and Faculty of Medicine, Baskent University, Adana, Turkey, ³Private practice, ⁴Faculty of Science and Letters, Baskent University, Ankara, Turkey

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 ($n = 63$) 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 ($\alpha = 0.05$).

Results: Statistically significant differences were found for all criteria among the groups ($p < 0.05$). The nonimpregnated 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 nonimpregnated 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.

P318

Effects of Immediate Provisional Restorations on Hard and Soft Tissues

Imene Guesmi¹, Dalenda Hadyaoui¹, Zohra Noura¹, Amina Taher Khiari¹, Nabil Miled², Mounir Cherif¹

¹Department of Prosthetic Dentistry, Dentistry University, Monastir, Tunisia, ²Department of Dentistry, Benba Hospital, Monastir, Tunisia

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.

P319

An Alternative Prosthetic Treatment Option for Posterior Edentulous Mandible: A Case Report

Nazire Esra Bağdatlı¹, Ahmet Ersan Ersoy¹, Şivge Kurgan²

¹Department of Prosthetic Dentistry, Ankara University, Ankara, Turkey, ²Department of Periodontology, Ankara University, Ankara, Turkey

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

Mustafa Kocacıklı, Betül Kökdoğan

Department of Prosthodontics, Gazi University, Ankara, Turkey

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

Saadet Atsü, Ali Can Bulut

Department of Prosthodontics, Faculty of Dentistry, Kırıkkale University, Kırıkkale

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 chamber 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 cusp, 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 cusp 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

Sema Murat¹, Serhat Durmaz², Ayhan Gürbüz³

¹Department of Prosthodontics, İstanbul Aydın University, İstanbul, Turkey, ²Department of Microbiology, Gülhane Military Medical Academy, Ankara, Turkey, ³Department of Prosthodontics, Ankara University, Ankara, Turkey

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.

P323

Adhesive Bridge Applications with Fibre Reinforced Composites (Report of Three Cases)

Işıl Karaokutan¹, Seçkin Karaokutan²

¹Department of Prosthodonty, Selçuk University, Konya, Turkey,

²Department of Dentistry, Medicana Hospital, Konya, Turkey

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 polyethylene fibre composite- and pontics which are made of natural tooth and composite resins to the adjacent teeth.

P324

Effect of Shading of Zirconium on Bond Strength to Porcelain

İlkin Tuncel¹, Erdal Eroğlu²

¹Department of Prosthodontics, Faculty of Dentistry, Bezmialem

Vakıf University İstanbul, Turkey, ²Department of Prosthodontics, Faculty of Dentistry, Süleyman Demirel

University, Eastern Campus, Isparta, Turkey

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, Zirkon Zahn) (15 × 12 × 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 ($\alpha = 0.05$).

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 between zirconia core material and veneer porcelain. However, results also show that bond strengths of all investigated groups are clinically acceptable.

P325

Two Unsplinted Mandibular Implant Overdentures: A 3-Year Longitudinal Prospective Study

Norsiah Yunus¹, Roslan Saub², Nosizana Mohd Salleh¹, Fauzza Siti Ahmad¹, Marisa Kiong¹, Renette Siok Lynn Gan¹

¹Department of Prosthetic Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia, ²Department of Community Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia

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.

P326

A Device for a Patient with Habitual Cheek Biting: A Case Report

Hasan Önder Gümüş¹, Mehmet Dinçel¹, Haydar Albayrak¹, Hasan Hüseyin Kocaağaoğlu¹, Osman Etöz²

¹Department of Prosthodontics, Erciyes University, Kayseri, Turkey, ²Department of Oral and Maxillofacial Surgery, Erciyes University, Kayseri, Turkey

Introduction: Habitual cheek biting, a form of self-injurious behavior (SIB) is the interposition of cheek mucosa during contact of opposing teeth and can be considered a treatment challenge in the dental office. Oral structures can play various roles in the process of this type self-injury.

Case: This case report describes the procedure for making an intraoral removable device to reduce the incidence of cheek biting and to improve patient oral function. This report also discusses

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

Gözde Çelik¹, Simge Kanar¹, İlhan Ramoğlu², Aslıhan Üşümez¹

¹Department of Prosthodontics, Bezmialem Vakif University, Istanbul, Turkey, ²Department of Orthodontics, Bezmialem Vakif University, Istanbul, Turkey

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

Seçil Karakoca Nemli¹, Stefan Wolfart², Cemal Aydın¹, Sven Reich²

¹Gazi University, Ankara, Turkey, ²RWTH Aachen University, Aachen, Germany

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 crowns 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 on the crowns 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), respec-

tively. 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

Nermin Demirkol¹, Fatih Sarı¹, Mehmet Demirkol², Özge Parlar¹

¹Department of Prosthodontic, Gaziantep University, Gaziantep, Turkey, ²Department of Maxillofacial Surgery, Gaziantep University, Gaziantep, Turkey

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 prosthodontic rehabilitation provides restoration of missing teeth and, surrounding tissue restoration, esthetic appearance, preservation of remaining teeth, and physiological 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 operation 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

Souzy Farid Shinaishin¹, Nadia Lashin Soliman², Effat Ahmed Abbass², Reham Magdy Ameen¹, Riham Mohamed Aly²

¹Department of Oral Biology, Ain Shams University, Cairo, Egypt, ²Department of Basic Dental Science, National Research Center, Cairo, Egypt

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

Muhammad Hassan Memon¹, Muhammad Umer Memon², Faizan Qaiser², Ayesha Memon²

¹Department of Dentistry, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan, ²Department of Medicine, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan

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 standard.

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

Cigdem Sarikir¹, Ilkay Peker¹, Zuhre Akarslan¹, Guven Kayaoglu²

¹Department of Dentomaxillofacial Radiology, Gazi University Faculty of Dentistry, Ankara, Turkiye, ²Department of Endodontics, Gazi University Faculty of Dentistry, Ankara, Turkiye

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 managements 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 from 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

Senem Ünver¹, Nuran Özyemişçi Cebeci², Seçil Karakoca Nemli¹

¹Department of Prostodontics, Gazi University, Ankara, Turkey, ²Polatlı Health Services Vocational School of Health Services, Hacettepe University, Ankara, Turkey

Objective: The aim of this study is to compare oral health attitudes and habits between preclinical and clinical dental students.

Materials and methods: A questionnaire was filled by 528 dental (366 preclinical and 162 clinical) students. Data was statistically analyzed by Pearson's Chi-Square tests.

Results: The source of oral hygiene education was significantly different between groups ($p < 0.01$), most preclinical students got from their families (45%), and clinical students from faculty (37%). Forty-nine percent and 58% of the preclinical and clinical students changed their toothbrushes quarterly, respectively ($p > 0.05$). Almost all of the students (96% of both group) used manual toothbrush. Most of preclinical (65%) and clinical (68%) students brushed their teeth twice a day ($p > 0.05$). The responses varied to the question on factors determining toothpaste choice. Ingredient (36% and 43% for preclinical and clinical, respectively) and price (15% and 20% for preclinical and clinical, respectively) of the toothpaste were the most frequent reasons which were significantly different between groups ($p < 0.05$). The frequency of the use interdental brush or dental floss was 32% for preclinical and 49% for clinical students ($p < 0.01$). The use of mouth rinse was found 16% and 19% for preclinical and clinical students, respectively ($p > 0.05$). Fifty-seven percentage of the clinical students underwent to professional dental care once or twice a year, while 45% of the preclinical students are not aware about dental care requirements ($p < 0.01$).

Conclusion: Oral health attitudes and habits of dental students improved with increasing level of education.

P334

Management of Erythema Multiforme

Putra Dermawan

Department of Oral Medicine, Mahasaraswati University, Denpasar, Bali, Indonesia

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 sametime target-like on skin. The etiology of EM until now is unknown. Many studies report the etiology of EM caused of 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.

P335

Dental Injury Incidence and Prevalence of Mouthguard in Japanese Ice Hockey Players

Akihiro Mitsuyama, Toshiyuki Takahashi, Mai Tanabe, Toshiaki Ueno

Department of Sports Medicine, and Dentistry, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Tokyo, Japan

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.

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 the 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.

P336

Human Salivary α -Amylase during Cold Pressor Test

Shunichi Oka¹, Honami Nakanishi¹, Osamu Shimizu², Naoto Suzuki³, Yoshiyuki Oi¹

¹*Department of Anesthesiology, Nihon University School of Dentistry, Tokyo, Japan,* ²*Department of Oral and Maxillofacial Surgery, Nihon University School of Dentistry, Tokyo, Japan,* ³*Department of Biochemistry, Nihon University School of Dentistry, Tokyo, Japan*

Aim of purpose: Dental treatments accompany stress. Salivary measurement of cortisol and more recently alpha-amylase (sAA) are used as biomarkers of stress. Alpha-amylase may be a useful indicator for activity of the sympathetic nervous system (SNS). However, questions remain to be answered before sAA can be accepted as an index of SNS activity. In this study, we evaluated the effects of cold pressor test on stress hormone and SNS.

Materials and methods: The subjects were 12 healthy volunteers aged 24–33 years. The Nihon University School of Dentistry approved the project and each subject gave signed, informed consent. We used cold pressor test as a psychological stressor by immersing subjects up to the waist in the cold water (3–4°C) for 1 min.

Samples of saliva for both cortisol and sAA were collected using salivette collection devices for 1 min before, during cold pressor test, and 3, 5, 10, 20, 30, 60 min after completion of the cold pressor test. For the assessment of autonomic changes, heart

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

Srikant Natarajan^{1,2}, D. S. Sriranjani^{1,2}

¹Department of Oral Pathology and Microbiology, Manipal College of Dental Sciences, Mangalore, India, ²Manipal University, Mangalore, India

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

Christos Kostantinidis

Private Practice, Athens, Greece

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 hers 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 possess 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

Aylin Sipahi Çalış, Candan Efeoglu, Bahar Sezer, Hüseyin Koca, Turgay Seçkin

Department of Oral and Maxillofacial Surgery, Ege University, İzmir, Turkey

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

Tatjana Kanjevac¹, Marija Milovanovic², Vladislav Volarevic², Nebojsa Arsenijevic², Aleksandra Lukic³

¹Department for Preventive and Pediatric Dentistry, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia,

²Center for Molecular Medicine and Stem Cell Research, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia,

³Department of Endodontics, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia

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 sinogenic host. Cytotoxic effect of GICs is in correlation with released fluoride, aluminium and strontium.

P341

Electronic Protocol for Focal Oral Diagnostics

Raya Georgieva Grozdanova Uzunova¹, Todor Tsonkov Uzunov¹, Angelina Ilieva Kisselova Yaneva¹, Boyan Apostolov²

¹Faculty of Dental Medicine, Medical University, Sofia, Bulgaria,

²IT-specialist, Sofia, Bulgaria

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

Prashanthi S. Madhyastha

Department of Dental Material, Manipal College of Dental Science, Mangalore, India

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 for different time point. HGF cells were observed for their proliferation, viability by MTT assay.

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.

P343

Temporomandibular Disorders, Headaches and Depression: Romanian Student Cohort Study

Valentin Radoi¹, Rafael Benoliel², Mihaela Raescu³,
Marian Vladimir Constantinescu¹

¹University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania, ²Hebrew University-Hadassah, Jerusalem, Israel,

³Universitatea "Titu Maiorescu", Bucharest, Romania

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 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.

P344

Evaluation of Dental Students' Reasons for Choosing Dentistry and Post-Graduation Career Plans

Pınar KURSOĞLU¹, Elifnaz ÖZEN², Yiğit FIRAT², Aslıhan AKGÜN²,
Tunahan ERÖZER², Begüm BANK², Simge ŞENALP³

¹Department of Prosthodontics, Faculty of Dentistry, Yeditepe University, Istanbul, Turkey, ²Faculty of Dentistry, Yeditepe University, Istanbul, Turkey, ³Department of Prosthodontics, Faculty of Dentistry, Yeditepe University, Istanbul, Turkey

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.

P345

The Effect of Boron on Alveolar Bone Loss in Osteoporotic Rats

Hülya TOKER¹, Hakan ÖZDEMİR¹, Hatice BALCI YÜCE²,
Fahrettin GÖZE³, Hüseyin AYDIN⁴

¹Department of Periodontology, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey, ²Department of Periodontology, Faculty of Dentistry, Gaziosmanpaşa University, Tokat, Turkey,

³Department of Pathology, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey, ⁴Department of Biochemistry, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey

Aim: The aim of this study is to investigate the effects of systemically administered boric acid on alveolar bone loss and mandibular bone density in experimental periodontitis model in osteoporotic rats.

Methods: Thirty-six male wistar rats separated to five study groups: Non-ligated control (C, $n = 6$) group; Periodontitis (P, $n = 6$) group; Osteoporosis (O, $n = 8$) group; Osteoporosis+Periodontitis (O+P, $n = 8$) group and Osteoporosis+Periodontitis with 50 mg/kg/day boric acid (BA50, $n = 8$) group for 15 days. Osteoporosis was created by intraperitoneal injection of 80 mg/kg retinoic acid for 15 days. 4/0 silk ligatures were placed around mandibular right first molar teeth to induce experimental periodontitis. After induction of osteoporosis and periodontitis, rats were sacrificed on 15 days. Alveolar bone loss was evaluated with a stereomicroscope by measuring the distance from cement-enamel junction to alveolar crest. At the

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

Naomi Yoshida¹, Kumiko Sugimoto², Satoe Suzuki³, Hideki Kudo³

¹Department of Dental Hygiene, Faculty of Health Sciences,

Chiba Prefectural University of Health Sciences, Chiba, Japan,

²Basic Oral Health Science, Faculty of Dentistry, School of Oral Health Care Sciences, Tokyo Medical and Dental University,

Tokyo, Japan, ³Department of Clinical Laboratory Medicine, Faculty of Health Science Technology, Bunkyo Gakuin University, Tokyo, Japan

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?

Hiroko Imura¹, Naomi Yoshida², Yoko Yamazaki¹, Masahiko Shimada¹, Kumiko Sugimoto³

¹Department of Orofacial Pain Management, Medical and Dental Sciences Graduate School, Tokyo Medical and Dental University,

Tokyo, Japan, ²Department of Dental Hygiene, Faculty of Health Sciences, Chiba Prefectural University of Health Sciences, Chiba,

Japan, ³Basic Oral Health Science, Faculty of Dentistry, School of Oral Health Care Sciences, Tokyo Medical and Dental University, Tokyo, Japan

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 value and the antioxidant capacity does not differ between the young and midlife adults. Furthermore, the measurement of salivary antioxidant capacity may be utilized for evaluating systemic antioxidant capacity and health status.

P348

Evaluation of Anaerobic Bacteria in Periodontitis by E Test Method

Badea Florin Ciprian¹, Nuca Cristina², Doina Paula Balaban³, Moldoveanu Lucia⁴, Sachir Erdogan⁵, Badea Victoria⁶

¹Faculty of Dental Medicine, Carol Davila, Bucharest, Romania,

²Department of Preventive Dentistry, Faculty of Dental Medicine, Ovidius University Constanta, Constanta, Romania, ³Department

of Biochemistry, Faculty of Dental Medicine, Ovidius University

Constanta, Constanta, Romania, ⁴Department of Prosthetics, Faculty of Dental Medicine, Ovidius University Constanta, Constanta, Romania, ⁵Faculty of Dental Medicine, Ovidius University Constanta, Constanta, Romania, ⁶Department of Microbiology, Faculty of Dental Medicine, Ovidius University Constanta, Constanta, Romania

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 intermedia 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

Marian Vladimir Constantinescu¹, Michael Gross², Grigore Lazarescu², Adrian Mihail Nistor²

¹Department of Prosthetic Dentistry, Carol Davila University, Carol Davila, Bucharest, Romania, ²Private Activity

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

Jose Ricardo Mariano, Elizabeth Ferreira Martinez
C.P.O. São Leopoldo Mandic, Campinas, Brazil

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 Gusmão *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

Eryi Lu¹, Chendi Xu², Xiaoye Yuan²

¹Ninth People's Hospital, Shanghai, China, ²College of Stomatology, Shanghai, China

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 in 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 grafted 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.

P352

Placement Gingival Level Implant on Posterior Mandibular
Pande Nyoman Puspaningyun

*Department of Prosthodontic, Mahasaraswati University,
Denpasar, Bali, Indonesia*

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.

P353

Allografts and Autografts Volume Changes after Vertical Augmentation

Julio Leonardo Oliveira Lima¹, Daniel Isaac Sendyk¹,
Wilson Roberto Sendyk², Maria Da Graça Naclério Homem¹,
Maria Cristina Zindel Deboni¹

¹Oral Surgery Department, School of Dentistry University of São Paulo, São Paulo, Brazil, ²Oral Implantology, School of Dentistry University of Santo Amaro, São Paulo, Brazil

Aim: The aim of the present study was to investigate changes in the volume of an irradiated, demineralized, freeze-dried bone allo-

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.

P354

Clinical Image Quality Assessment in Panoramic Radiography

Meltem Mayıl, Gaye Sezgin, Filiz Namdar Pekiner
*Department of Oral Diagnosis and Radiology, Faculty
of Dentistry, Marmara University, İstanbul, Turkey*

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 Veraviewopcs 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

Funda Bayındır, Melike Pınar Yıldırım, Nuran Yanıkoğlu
Department of Prosthodontics, Atatürk University, Erzurum, Turkey

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 maxillary 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

Tuğrul Sarı¹, Ahmet Mihmanlı², Artur İsmatullaev¹,
Aslıhan Üşümez¹

¹*Department of Prosthodontics, Bezmialem Vakıf University, Istanbul, Turkey,* ²*Department of Oral and Maxillofacial Surgery, Bezmialem Vakıf University, Istanbul, Turkey*

Introduction: Partial or total resection of mandibula 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

Ferhan Egilmez¹, Gulfem Ergun¹, Isil Cekic Nagas¹,
Pekka K. Vallittu², Lippo V.J. Lassila²

¹*Department of Prosthodontics, Faculty of Dentistry, Gazi University, Ankara, Turkey,* ²*Institute of Dentistry, University of Turku, Turku, Finland*

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.

P358

3D Course of Inferior Alveolar Canal Defined by Cone Beam Computed Tomography

Betül Taş, Nurgül Kömerik

Süleyman Demirel University, Faculty of Dentistry, Department of Oral & Maxillofacial Surgery, Isparta, Turkey

Aim: The aim of this study was to define the course of inferior alveolar nerve within the mandible to delineate safety zones for dentolaveolar 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.

P359

A Dental Volumetric Tomography Study on the Visualization of the Mental Foramen's Anterior Loop in Dentate Patients

Arzu Demir, Elif Sarioğlu, Filiz Namdar Pekiner

Department of Oral Diagnosis and Radiology, Faculty of Dentistry, Marmara University, Istanbul Turkey

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 mandibula. If the mental branch leaves the inferior alveolar nerve posterior 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.

P360

Temperature Changes During Simulated Implant Surface Decontamination with Er: YAG Laser

İlker Keskiner¹, Mahmut Sumer², Ahmet Aydoğdu¹,

Soner Cankaya³

¹Department of Periodontology, Faculty of Dentistry, Ondokuz Mayıs University, Samsun, Turkey, ²Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Ondokuz Mayıs University, Samsun, Turkey, ³Department of Biostatistics, Faculty of Medicine, Ordu University, Ordu, Turkey

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 ($\lambda = 2.940$ nm) (pulse energy, 150 mJ; pulse duration, 300 μ s; 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.

Theme: Implantology: Oral Medicine

P361

Lateral Lingual Vascular Canals in the Mandible: A CBCT Study

Iuliana Babiuc, Daniela Babiuc

Department of Removable Prosthodontics, Faculty of Dentistry, University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania

Purpose: To investigate the presence of the lingual foramina and their bony canals in the premolar region of the mandible by means of cone beam computed tomography.

Materials and method: Fifty-four subjects underwent CBCT examination of the mandible for implant therapy. The axial cross sections 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 typically 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 canal 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

Alper Kaya¹, Beyza Kaya¹, Faysal Ugurlu²

¹Department of Oral and Maxillofacial Surgery, Dentistry Faculty, Dicle University, Diyarbakir, Turkey, ²Department of Oral and Maxillofacial Surgery, Dentistry Faculty, Marmara University, Istanbul, Turkey

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 tissues 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 predominantly occurs in the second decade of life in young females, possibly because of the vascular effects of female hormones. Clinically, oral PG is a smooth or lobulated exophytic lesion manifesting 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 treatment protocols such as the use of Nd:YAG laser, flash lamp pulsed dye laser, cryosurgery, intralesional injection of ethanol or corticosteroid 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.

Theme: Implantology: Oral Surgery

P363

Changes in Plasma Catecholamine Concentrations and Circulatory Dynamics in Response to Administration of 2% Lidocaine to Which Different Amounts of Adrenaline Had Been Added

Kimito Sano¹, Akira Yamaguchi², Masutaka Mizutani², Jun Ueda², Toru Akasiba²

¹Department of Dental Anesthesiology, The Nippon Dental University School of Life Dentistry, Niigata, Japan, ²Department of Oral and Maxillofacial Surgery, The Nippon Dental University School of Life Dentistry, Niigata, Japan

Purpose: We investigated the effect of local anesthetics on plasma catecholamine concentrations and circulatory dynamics and attempted to find a method that would minimize their effects.

Materials and methods: We divided 40 healthy male volunteers into five groups: an adrenaline-free group (group I), 10 µg adrenaline group (group II), 20 µg adrenaline group (group III), 40 µg adrenaline group (group IV), and 50 µg adrenaline group (group V), and used a 30G needle to inject 4.0 ml of 2% lidocaine containing the different amounts of adrenaline in each of the above groups into the gingivobuccal fold of the upper first premolar over a 2-min period, after which we collected serial blood samples and made serial measurements of circulatory dynamics. The study was approved by the ethical committee at Nippon Dental University.

Results: No significant increase in plasma adrenaline concentration was observed in Group I, whereas in groups II, III, IV, and V the concentration rose, peaked 5 min later, and then gradually declined.

The percentage increases in the plasma adrenaline concentration in groups II, III, and IV were positively correlated with the doses of adrenaline administered, whereas a marked increase above the estimated value was observed in group V.

P364

Digital Imaging Evaluation of Bone Defects Healing: Animal StudyManuela Pescaru¹, Marius Bud², Floarea Fildan¹¹Department of Radiology, Faculty of Dental Medicine, "Iuliu Hatieganu" University, Cluj-Napoca, Romania, ²Department of Endodontics, Faculty of Dental Medicine, "Iuliu Hatieganu" University, Cluj-Napoca, Romania**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 assesment 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

Mehmet Oğuz Borahan, Filiz Pekiner, Asım Dumlü

Department of Oral Diagnosis and Radiology, Marmara University, Istanbul, Turkey

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 distoplatinal root to sinus floor was 1369 mm; mesioplatinal root to sinus floor 2014 mm and the palatal root to sinus floor 1553 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

Yanping Zhao, Xuchen Ma

Department of Oral Radiology, Peking University School and Hospital of Stomatology, Beijing, China

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. ①mixed pattern (10 cases): periosteal new bone formation with destruction of medular and/or cortical bone. ②proliferative pattern (five cases): periosteal new bone formation with intact or small defect of cortical bone. ③sclerotic pattern (three cases): sclerotic change spread extensively in the mandible. ④sequestrum 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

Amr Adel Abdelaty, Gamal Mohamed Moutamed

Oral and Maxillofacial Surgery Department, Faculty of Dentistry, British University in Egypt, El-Sherouk City, Egypt

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.

P368

Implant Treatment in Patient with Chronic Alcoholism – A Case Report

Banu Gürkan Köseoğlu, Neşe Kahraman, Çağrı Akçay
Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, Istanbul University, Istanbul, Turkey

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 İstanbul 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 occurred.

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.

P369

Laser Assisted Depigmentation Treatment with ER:CR: YSGG Laser – A Case Report

Banu Gürkan Köseoğlu, Neşe Kahraman, Çağrı Akçay
Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, Istanbul University, Istanbul, Turkey

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 homeostasis, 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.

P370

Assessment of Buccal Cortical Bone Osteotomy for Benign Mandibular Lesions

Toru Akashiba¹, Masutaka Mizutani¹, Jun Ueda¹, Kimito Sano², Akira Yamaguchi¹

¹*Oral & Maxillofacial Surgery, Niigata Hospital, The Nippon Dental University, Niigata, Japan,* ²*Department of Dental Anesthesiology, School of life Dentistry at Niigata, The Nippon Dental University, Niigata, Japan*

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

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 alveolus 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

Banu Özveri Koyuncu, Mert Zeyinoğlu, Ayhan Tetik, Murat Gomel

Department of Oral and Maxillofacial Surgery, Ege University, İzmir, Turkey

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

Zinoviy Ozhogan, Natalia Mahlynets

Department of Prosthetic Dentistry, Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine

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, reographical 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

Mustafa Cenk Durmuşlar¹, Ahmet Ferhat Mısırlı¹, Akif Türel²

¹Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Bülent Ecevit University, Kozlu/Zonguldak, Turkey,

²Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Ondokuz Mayıs University, Samsun, Turkey

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 supernumerary 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 sulcular 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

Didem Özkal Eminoğlu¹, Cenk Fatih Çanakçı¹, Alparslan Dilsiz¹, Timur Eminoğlu²

¹Department of Periodontology, Atatürk University, Erzurum, Turkey, ²Denterzurum Dental Clinic, Erzurum, Turkey

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 osseointegration.

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 right maxillary 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

Hasan Suat Gokce¹, Osman A. Bengi¹, Mustafa Nisanci², Aykan Andac², Selcuk Isik²

¹Medical Design and Manufacturing Center, Gulhane Military Medical Academy, Ankara, Turkey, ²Department of Plastic and Reconstructive Surgery, Gulhane Military Medical Academy, Ankara, Turkey

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 referred to our center for the manufacturing 3D plastic model (ABS plastic, ZCorp). 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 (TiAlV) 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

P376

Role of Chewing Gum in Caries Preventing Among Children

Rumiya Abbasova, Farida Gulieva

Department of Pediatric Dentistry, Azerbaijan Medical University, Baku, Azerbaijan

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”, sialoschisis, poor self-purification, and for improving the remineralization processes of hard tissues of the teeth.

P377

Results of Supervised Toothbrushing with the Remineralizing Toothpaste in Dental Caries Prevention

Leous Lidia¹, Zhardetsky Alexandr², Kupets Tatjana¹, Matelo Svetlana¹

¹Belorussian State Medical University, Minsk, Belarus,

²Minsk Public Health Committee, Minsk, Belarus

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-yrs-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%). Comparison 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.

P378

Investigation of Mouth-Dental and Physical Health of Some University Students

Hulya Erdem Asan

Faculty of Dentistry, Trakya University, Edirne

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 doesn'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.

P379

Effect of the Fluoride Varnishes Comparing to CPP-ACP Complex on Human Enamel Demineralization/Remineralization

Vesna Ambarkova¹, Kristina Gorseta², Domagoj Glavina², Mira Jankulovska¹, Ilija Skrinjaric²

¹*Department of Pediatric and Preventive Dentistry, Faculty of Dentistry, University Sv.Cyril & Methodius, Skopje, R.Macedonia,* ²*Department of Paediatric and Preventive Dentistry, School of Dental Medicine, University of Zagreb, Zagreb, Croatia*

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.

P380

Effects of Titratable Acidity and Organic Acids on Enamel Erosion

Eun Jeong Kim, Kwang Hak Bae, Dai Il Paik, Bo Hyoung Jin
Department of Preventive and Social Dentistry, Seoul National University, Seoul, South Korea

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 1:1.5, 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 50 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 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 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

P381

The Epidemiological Investigation of Dental Caries among the 5 Years Old Children in Shanghai Suburban District

Yueling Li, Qin Du, Xiaoyan Mao

Jiading District Dental Hospital, Shanghai China

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.

P382

Dental Caries Experience and Treatment Needs among 12 Years Old in Albania

Dorjan Hysi¹, Etleva Droboniku¹, Celjana Toti¹, Elizana Petrela²

¹Faculty of Dental Medicine, University of Medical Science,

Tirana, Albania, ²Faculty of Public Health, University of Medical Science, Tirana, Albania

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 \pm 2.66), the mean D = 2.02 (SD \pm 2.06), SiC = 6.72 (SD \pm 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 \pm 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.

P383

Permanent Molars Eruption in Mexican Rural and Urban Population

Laura Patricia Sáenz¹, Leonor Sánchez¹, Jorge Alanís², Judith Arjona², María Eugenia Rodríguez³, Heriberto Vera⁴

¹Metropolitan Autonomous University-Xochimilco, Mexico, ²Autonomous University of the State of Mexico, Mexico, ³National Mouth Health Program of the National Center of Epidemiologic Watch and Diseases Control, Mexico, Mexico, ⁴Ex-Subdirectory of National Mouth Health Program of the National Center of Epidemiologic Watch and Diseases Control, Mexico, Mexico

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 consentment 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

($p = 0.002$). 7.6% of the erupted molars had 1/3 of eruption, 49.6% had 2/3, and 32.6% full eruption. All first molars presented significant difference regarding age ($p < 0.05$). The eruption of the left lower molar first just presented significant difference in the population type ($p = 0.032$).

Conclusions: Not all permanent molars had erupted at the age of seven. Generally, girls showed a stronger tendency in advanced presence of first molars than boys.

P384

After-Hours Outpatient Visits to the Nippon Dental University Niigata Hospital

Jun Ueda¹, Akira Yamaguchi¹, Masutaka Mizutani¹, Kimito Sano², Toru Akashiba¹

¹Oral & Maxillofacial Surgery, Niigata Hospital, The Nippon Dental University, Niigata, Japan, ²Department of Dental Anesthesiology, School of Life Dentistry at Niigata, The Nippon Dental University, Niigata, Japan

Objective: In the Nippon Dental University Niigata Hospital, an oral surgeon provides 24-h, 365-day emergency treatment on holidays/after hours while working on duty. The author summarized the findings from a clinical assessment of after-hours outpatient visits to the department of oral surgery for dental/oral surgical diseases.

Objective: The after-hours emergency patients who visited the department from January 2006 to December 2010 were assessed. Hours of visits, disease names, contents of the procedures were investigated.

Results: In the period, 2881 patients with dental/oral surgical diseases visited the department after hours. Their disease names at the time of visit included many dental diseases like toothache as well as injuries. Hours with the largest patient count were 10:00–12:00 on holidays and 20:00–22:00 at night, suggesting effect of visits of the patients with difficulty in making regular-hours visits. Visits for injuries were 705 cases (24.5%), in which 486 (68.9%) were for laceration followed by tooth dislocation, tooth fracture, and jaw fracture in order of decreasing case counts. Regarding the contents of the procedures, 1408 cases (48.9%) were prescription/irrigation only followed by wound treatment (suture), reduction/fixation (tooth dislocation/jaw dislocation, etc.), and administration of anti-inflammatory/antimicrobial drugs in order of decreasing procedures.

Conclusion: Many of the after-hours visits were highly emergency cases including injuries or severe infections, confirming contribution of the emergency treatment provided by the oral surgeon to the local medical services.

P385

Role of Gene Variations of Toll like Receptors 2, 3 and 4 on Genetic Susceptibility to Periapical Pathosis

Ülkü Özcan¹, Zeynep Ocak², Fatih Özcan³, Elif Aybala Oktay⁴, Halil Şahman⁵, İhsan Yıkılğan⁶, Hasan Oruçoglu¹

¹Department of Endodontics, Faculty of Dentistry, Abant İzzet Baysal University, Bolu, Turkey, ²Department of Biology and Genetics, Faculty of Medicine, Abant İzzet Baysal University, Bolu, Turkey, ³Department of Maxillofacial Surgery, Faculty of Dentistry, Abant İzzet Baysal University, Bolu, Turkey, ⁴Department of Dental Sciences, Gülhane Military Medical Academy, Ankara, Turkey, ⁵Department of Oral and Maxillofacial Radiology, Faculty of Dentistry, Abant İzzet Baysal University, Bolu, Turkey, ⁶Department of Restorative Dentistry and Endodontics, Faculty of Dentistry, Gazi University, Ankara, Turkey

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 the 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

P386

Middle Meningeal Artery as an Independent Module in Craniofacial Growth

Isabel Ferros Santos, Publio Jimenez, Urbano Santana Mora, Arturo Martinez Insua
School of Dentistry, Faculty of Medicine and Odontology, Santiago de Compostela University, Santiago de Compostela, Spain

Aim: It is assumed that the development and growth of the endocranial structures leads to the final configuration of the calvarian 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 tps-Dig2 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.

P387

Skeletal Open Bite Treatment with Zygomatic Anchorage: A Case Report

Defne Yanık, Evren Öztaş, Sönmez Fıratlı

Department of Orthodontics, Istanbul University, Istanbul, Turkey

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.

P388

Prevalence of Posterior Crossbite in Turkish Population

Emine Kaygısız¹, Kahraman Güngör², Lale Taner¹

¹Department of Orthodontics, Faculty of Dentistry, Gazi University, Ankara, Turkey, ²Department of Oral and Dento-Maxillofacial Radiology, Faculty of Dentistry, Gazi University, Ankara, Turkey

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.

P389

Orthodontic Treatment of a Maxillary Impacted Canine with Autotransplantation

Sevin Erol Üretürk, Evren Öztaş

Department of Orthodontics, Istanbul University, Istanbul, Turkey

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.

P390

Impacted Anterior Teeth Due To Odontomas: A Case Report of Two Cases

Göksu Trakyalı¹, Burcu Karaduman², Şerife Özalp³,
Bahadır Dindar⁴, İltar Uzel¹, Vakur Olgaç⁵

¹Department of Orthodontics, Istanbul Aydin University, Istanbul, Turkey, ²Department of Periodontology, Istanbul Aydin University, Istanbul, Turkey, ³Department of Pedodontics, Bezmialem University, Istanbul, Turkey, ⁴Department of Oral and Maxillofacial Surgery, Istanbul Aydin University, Istanbul, Turkey, ⁵Department of Tumor Pathology, Institute of Oncology, Istanbul University, Istanbul, Turkey

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 effected 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.

P391

Management of White Spot Lesion after Orthodontic Treatment: A Case Report

Gökhan Serhat Duran, Serkan Görgülü, Sıla Mermut Gökçe
Department of Orthodontics, Center of Dental Sciences, Gulhane Medical Academy, Ankara, Turkey

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.

P392

Comparison of Linear and Angular Measurements Using 2D Conventional Methods and 3D CBCT Images Using Different Rendering Software

Umay Kelahmet¹, Seçil Aksoy², Kaan Orhan²

¹Department of Orthodontics, Faculty of Dentistry, Near East University, TRNC, Nicosia, Cyprus, ²Department of Dentomaxillofacial Radiology, Faculty of Dentistry, Near East University, TRNC, Nicosia, Cyprus

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 Dent OC. Invivo anatomage[®], Maxilim[®], 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 Kruskal-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.

P393

Evaluation of the Effectiveness of Casein Phosphopeptide (Tooth Mousse) On the Oral Hygiene in Orthodontic Patients

Didem Aktan¹, Ülkü Başer², Süheyla Kaya², Hülya Kılıçoğlu¹

¹Department of Orthodontics, Istanbul University, Istanbul, Turkey, ²Department of Periodontology, Istanbul University, Istanbul, Turkey

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 , osteoprotegerin 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 is statistically significant difference in GCF Osteoprotegerin, 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.

P394

Study of the Efficiency of Remineralizing Gel by Scanning Electron Microscopy

Suetenkov Ye. Dmitry¹, Gritsenko A. Elena¹,

Zaharevich M. Andrey², Aleksandrov I. Anton¹

¹Saratov State Medical University named after V.I. Razumovsky, Saratov, Russia, ²Saratov State University named after N.G. Chernyshevsky, Saratov, Russia

Aim: Evaluation of the efficiency of the remineralizing gel in dynamics, against the background of forthcoming phase of orthodontic treatment.

Materials and methods: We used a remineralizing agent that is customly 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 500 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.

P395

The Relationship between Tooth Brushing Habits and Residing of the Patients Seeking Orthodontic Treatment in Van, Turkey

Fatih Kazancı, Özer Alkan

Department of Orthodontics, Yüzüncü Yıl University, Van, Turkey

Aim: Tooth brushing habit and periodical dentist control constitute the foundation of oral and dental health. Most of the patients seeking orthodontic treatment have not enough oral hygiene at the first appeal to orthodontics clinics. The aim of this study was to evaluate the oral hygiene status of the patients seeking orthodontic treatment and to emphasize the importance of preventive dentistry services in Van, Turkey.

Subjects and methods: The study involved 215 patients seeking orthodontic treatment. Age, sex, residing, and tooth brushing habits were recorded at the first visit to orthodontics clinic. The distribution of tooth brushing habits of the patients was checked by using Chi-Square test.

Results: The average age of the patients was 12.99 ± 0.76 years old. Of the patients seeking orthodontic treatment, 142 (66%) were from the city center and 73 (34%) were from the towns or rural areas. The frequency of tooth brushing were three times a day for 43 patients (20%), twice a day for 48 patients (22.3%), once a day for 41 patients (19.1%), once-twice or three times a week for 41 patients (19.1%), once or twice a month for six patients (2.8%) and never tooth brushing for 36 (16.7%) patients. There were statistically significant differences between the distribution of tooth brushing habits of urban and rural children.

Conclusion: It is concluded that tooth brushing habits of children aged among 12–14 years were inadequate especially children living in the rural areas of Van, Turkey. Children are needed to be informed of dental health more excessively.

P396

Rapid Maxillary Expansion with Fan Type Hyrax Appliance in Treatment of Maxillary Anterior Skeletal Deficiency: A Case Report

Pınar Altuğ, İsmail Korhan Gider, Sila Mermut Gökçe, Serkan Görgülü

Department of Orthodontics, Gulhane Military Medicine Academy, Ankara, Turkey

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 prognathism 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 I 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.

P397

Designing a New Better Orthodontic TAD System

Dmitry Yevgenievich Suetenkov¹, Orest Zinovievich Topolnitsky², Elena Andreevna Gritsenko¹, Andrey Dmitrievich Baltaev¹

¹*Department of Orthodontics and Pedodontics, Saratov State Medical University, Saratov, Russia,* ²*Department of Pediatric Surgical Dentistry and Maxillofacial Surgery, MSUMD, Moscow, Russia*

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

P398

Effect of Chronic Periodontitis Oxidant and Antioxidant Status in Patients with Familial Mediterranean Fever

Vildan Bostancı¹, Hülya Toker¹, Soner Şenel², Hakan Özdemir¹, Hüseyin Aydın³

¹*Department of Periodontology, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey,* ²*Department of Rheumatology, Faculty of Medicine, Erciyes University, Kayseri, Turkey,* ³*Department of Biochemistry, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey*

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

Tara Bai Taiyeb Ali¹, Khamiza Zainol Abidin², Afifah Othman¹, Nurul Amira Abdul Rahim¹

¹Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia, ²Dental Division Ipoh, Ministry of Health, Perak, Malaysia

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, Listerine® 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.

P400

Effect of Non-Surgical Periodontal Therapy on IL-8 Level in Gingival Crevicular Fluid in Overweight and Obese Subjects with Chronic Periodontitis

Amany Mohie Eldeen Elsayed

Department of Surgery and Oral Medicine, National Research Center, Cairo, Egypt

Overweight and obesity have been suggested to be associated with periodontitis reported in different studies and narrative summaries. The aim of the present study to assess the association of overweight and obesity with chronic periodontitis and its role on

periodontal clinical parameters and determine the interleukin-8(IL-8) level before and after non-surgical periodontal therapy.

Subjects and methods: This study included 14 obese subjects (body mass index $\geq 30 \text{ kg/m}^2$ and 12 overweight subjects (body mass index $\geq 25 \text{ kg/m}^2$) were enrolled in this study. The age of the study participants was from 35 to 48 years. Subjects in both groups had generalized chronic periodontitis. The periodontal parameters measured before and 3 months after non-surgical periodontal therapy were: visible plaque index, bleeding gingival index, probing depth. In addition, gingival crevicular fluid (GCF) sample was collected from both groups to detect interleukin-8(IL-8) level using filter paper strip. The level of IL-8 was determined using ELIZA Kits.

Results: There was a statistical significant improvement after periodontal therapy: decreased visible plaque index, bleeding gingival index (p-value 0.871), bleeding on probing (p-value 0.871), probing depth (p-value 0.784) with significant at ($p \leq 0.05$) in both groups. Circulatory IL-8 showed lower mean% reduction (0.02%) in obese than overweight subjects after non surgical periodontal treatment.

Conclusion: An improved response to non-surgical periodontal therapy is observed in both obese and overweight patients, with lower IL-8 level in obesity than overweight. Though obesity does not seem to play a negative role in the improvement of the periodontal clinical response, although it could be useful to include evaluation of BMI in oral health examination.

P401

Nitric Oxide as a Potential Inflammatory Marker in Gingivitis and Chronic Periodontitis: Analysis of Gingival Crevicular Fluid

Ali Orkun Topcu¹, Kemal Burak Sahbazoglu¹, Alev Akalin¹, Nermin Yamalik¹, Kamer Kilinc², Erdem Karabulut³, Tolga Fikret Tözüm¹

¹Department of Periodontology, Faculty of Dentistry, Hacettepe University, Ankara, Turkey, ²Department of Biochemistry, Faculty of Medicine, Hacettepe University, Ankara, Turkey, ³Department of Biostatistics, Faculty of Medicine, Hacettepe University, Ankara, Turkey

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/nitrite level. Nitrite is a better periodontal disease marker than nitrate and may be used as an early detection marker of periodontal inflammation.

P402

Management of Gingival Hyperpigmentation with 980 nm Diode Laser Irradiation

Hanaa Mohammed Elshenawy¹, Mohammed Ahmed Quriba²

¹National Research Centre, ²National Institute of Laser Enhanced Science

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 hyper pigmentation 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 µm 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 hyper pigmentation.

P403

The Effect of Povidone Iodine on Human Beta Defensin-1 Level

Hacer Sahin Aydinlyurt, Ahu Dikilitas, Ahmet Cemil Talmac, Abdullah Seckin Ertugrul

Department of Periodontology, Faculty of Dentistry, Van Yuzuncu Yil University, Van, Turkey

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.

P404

Early Tooth Loss Due To Smoking in Local Population

Hasan Mehdi Zaidi¹, Hamza Syed M², Faizan Syed M¹, Zainab Haji¹

¹Department of Oral Surgery, Fatima Jinnah Dental College, Karachi, Pakistan, ²Department of Restorative Dentistry, DIEKIOHS, Karachi, Pakistan

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

Nazlı Zeynep Alpaslan, Hacer Sahin Aydinyurt, Ahu Dikilitas, Abdullah Seckin Ertugrul

Department of Periodontology, Faculty of Dentistry, Yuzuncu Yil University, Van, Turkey

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 chlorhexidine-digluconate 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 effect of chlorhexidine irrigation on microorganisms in periodontal pockets. Understanding the effect of chlorhexidine-digluconate needed to work harder.

P406

Relationship between Glycemic Control and the Level of Periodontitis

Sinem Yıldız Çiftlikli, Yaprak Kırbaş, Bahar Kuru, Başak Doğan
Department of Periodontology, Marmara University, Istanbul, Turkey

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 $\geq 7\%$ 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.

P407

The Effect of Testosterone on Gingival Health in Young Puberty Boys

Vera Radojkova Nikolovska, Mirjana Popovska, Bruno Nikolovski, Biljana Dzipunova, Vera Stojanovska, Olga Kokoceva

Faculty of Dentistry, Skopje, Macedonia

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-DSL 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 SydneySameer Bhole¹, Roneel Kartik Maharaj², Seemagni Naidu², Amit Arora²¹*Sydney and South Western Sydney Local Health Districts, Sydney Dental Hospital, Sydney, NSW, Australia,* ²*Faculty of Dentistry, University of Sydney, Sydney, NSW, Australia*

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 ProfessionalsHelen Carey¹, Louise Houtzager², Priyadi Prihaswan³, Azizul Haque Mahee⁴, Angela Langton⁵, Jae Condon⁶, Douglas Knox³, Robert Ball⁷¹*Periodontics, Sydney Dental Hospital, Sydney, NSW, Australia,*²*Nutrition Development Division, The Albion Centre, Sydney, NSW, Australia,* ³*HIV/AIDS and Related Programs Unit, South Eastern Sydney Local Health District, Sydney, NSW, Australia,*⁴*HIV/AIDS and Related Programs Unit, Sydney Local Health District, Sydney, NSW, Australia,* ⁵*Community HIV, Sydney Local Health District, Sydney, NSW, Australia,* ⁶*AIDS Council of New South Wales, Sydney, NSW, Australia,* ⁷*HIV/AIDS and Related Programs Unit, South Western Sydney Local Health District, Sydney, NSW, Australia*

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

Sid Ahmed Serradj, Farah Chahrazad Belmabrouk, Nesrine Ghenim, Ali Souabi

Service of Odontology, Department of Dental Medicine, Oran, Algeria

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.

- 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.
- After chemotherapy: we describe how to solve some persisted problems. Infection prevention and maintaining hygiene are the keys of treatment.

P411

A Regional Perspective on Medical Geology and the Fluorosis Problem in Turkey

Ümit Demirel¹, Tuncay Delibaşı², Gamze Aren³

¹Dental Clinic, Leprosy Hospital, Istanbul, Turkey, ²Department of Endocrinology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey, ³Department of Pediatric Dentistry, Istanbul University, Istanbul, Turkey

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.

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.

P412

Occupational Safety and Health in the Dental Therapy Practice

Eleftherios Ntokos¹, Panagiota Dokou², Eleni Dadiotou Ntokou²

¹Tzaneio General Hospital of Piraeus, Piraeus, Greece, ²Private Practice

Aim: The various risks faced by dental therapists and employees in the dental therapy practice have not yet been studied sufficiently in order to ensure safe conditions.

The diagnostic and therapeutic methods applied in dentistry pose diverse hazards that need to be managed for the benefit of the community. The rapid advances in medical technology make the need of implementing safety guidelines in the dental therapy practice imperative.

Materials and methods: The purpose of this study was to examine all preventive measures being applied in the dental therapy practice in order to minimize the risk of exposure to various health hazards such as

- 1 musculoskeletal disorders
- 2 risks from the effects of ionizing radiation on tissues and organs
- 3 management of health care waste such as mercury waste and finally,
- 4 exposure of dental therapists and employees to various infections as well as infection control in the dental therapy practice

Finally, a clear reference is made to the latest views regarding sterilization and disinfection (methods, disinfectants, sterilants-materials).

Results: All kinds of precautions should be taken in order to ensure the occupational safety and health protection of dental therapists and employees in the dental therapy practice.

Conclusions: Dental therapists and employees are entitled to safe working conditions and should regularly be informed by the responsible state body. Therefore, every effort must be made to isolate or eliminate health hazards in the dental therapy practice.

P413

Oral Hygiene Education in Children with Sensory Hearing Deprivation

Vasily Alyamovskiy, Natalia Tarasova, Vladislav Galonskiy,

Anatoly Duzh, Olesia Eleseeva

Department of Dentistry, Krasnoyarsk State Medical University, Krasnoyarsk, Russia

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

the “satisfactory” level of oral hygiene. PMA index before hygienic training in children with sensorineural hearing loss was 36.6%, in children with deafness 35.4%, improvement of periodontal tissue occurred after 3 months by an average of 3.8%.

Conclusion: The result of hygienic education programs for children with sensory deprivation hearing is not only to improve dental health, but also the development of the emotional sphere of the individual, stimulation of cognitive processes.

P414

Oral Health Care Practices of Preschool Children and Their Parents, in the Area of Athens, Greece

Dimitris Dimitriadis, Iraklis Foskolos, Miltiadis Tseris, Rigas Konstantinidis
Stomatological Society of Greece, Greece

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.

P415

Socio-Demographic Factors and Dental Caries in an Adult Bosnian Population

Jelena Krunić¹, Nikola Stojanović¹, Smiljka Cicmil², Stevanka Djordjević³

¹*Department of Restorative Dentistry and Endodontics, Faculty of Medicine, University of East Sarajevo, Foca, Bosnia and Herzegovina,* ²*Department of Periodontology and Oral Medicine, Faculty of Medicine, University of East Sarajevo, Foca, Bosnia and Herzegovina,* ³*Department of Preventive Dentistry, Faculty*

of Medicine, University of East Sarajevo, Foca, Bosnia and Herzegovina

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.

P416

Improving Oral Health Care of People with Sickle Cell Disease

Andrea Soares Quirino Da Silva Fonseca¹, Mirella Giongo¹, Marcia Pereira Alves Dos Santos², Vanessa Maria Souza E. Silva¹, Marlene Do Carmo Cezini¹

¹*School of Dentistry, University Federal of Rio de Janeiro, Rio de Janeiro, Brazil,* ²*Ministry of Health of Brazil, Brazil*

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

Department of Pediatric Dentistry, State Medical and Pharmaceutical University "Nicolae Testemitanu", Chisinau, Republic of Moldova

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.

P418

Dental Caries Severity and Body Mass Index in Kinder Garden Children, Bali-Indonesia

Yudha Rahina

Dental Public Health Department Faculty of Dentistry, Mahasaraswati University, Denpasar Bali, Indonesia

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 dmft: 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.