Friday, August 30, 2013

FREE COMMUNICATIONS SESSIONS 33–46

Free Communication Session 33 | B332 | 30.08.2013 | 09:00–11:00

Theme: Dental Treatment & Restorative Dentistry: Materials

FC199

Enamel Remineralization by Toothpastes (SEM, EDX and 3D-stereomicrographic Study)

Elizabeta S. Gjorgievska[1], John W. Nicholson[2], Ian J. Slipper[3], Marija M. Stevanovic[1], Sonja M. Apostolska[4], Mira A. Jankulovska[1], Meri V. Pavlevska[1], Aleksandar Gj Dimkov[1]
[1]Department of Paediatric and Preventive Dentistry, Faculty of Dental Medicine, University "Ss. Cyril and Methodius", Skopje, Republic of Macedonia, [2]St Mary's University College, Twickenham, London, UK, [3]School of Science, University of Greenwich, Chatham, Kent, UK, [4]Department of Conservative Dentistry, Faculty of Dental Medicine, University "Ss. Cyril and Methodius", Skopje, Republic of Macedonia

Aim: The purpose of the study was to examine the remineralizing potential of different toothpaste formulations when applied to demineralized enamel.
Materials and methods: The study was performed on extracted permanent molars, with the roots cut at the level of cemento-enamel junction. The coronal segments were submitted to five demineralization/remineralization cycles: demineralization was carried out by an artificial caries gel (pH = 4.5) and remineralization by rubbing with toothpastes containing bioactive glass, hydroxyapatite or strontium acetate and fluoride. Afterwards, the teeth were cut in half along the longitudinal axis. The first half was imaged uncoated with FEG-SEM and 3D anaglyphs were created. The second half was cast in resin, cured, the surface of the blocks was ground flat, polished, carbon coated and analysed with a FEG-SEM (BEI). Qualitative EDX analysis was performed by collecting X-ray line-scans along the line that goes from the resin into the enamel. Semi-quantitative EDX point analysis was performed on the enamel surface to determine the elemental levels (%) of sodium, magnesium, aluminium, phosphorus and calcium. The statistical analysis was performed by one-way ANOVA ($p < 0.05$) and post-hoc Tukey's HSD test.
Results: The results proved that the hydroxyapatite and bioactive glass-containing toothpastes were highly efficient in promoting enamel remineralization by formation of deposits and a protective layer on the surface of the demineralized enamel, whereas the toothpaste containing strontium acetate and fluoride had little, if any remineralization potential.
Conclusions: In conclusion, the treatment of demineralized teeth with toothpastes containing hydroxyapatite or bioactive glass resulted in repair of the damaged enamel tissue.

FC200

Evaluation and Comparision of the Shear Bond Strength of Three Different Metal-Ceramic Repair Systems

Gülsüm Sayın, Özgür İnan
Department of Prosthodontics, Selcuk University, Konya, Turkey

Purpose: This study evaluated the shear bond strength of three different repair systems for metal-ceramic restorations applied on metal and porcelain.
Materials and methods: Substrates to which porcelain repair materials would be applied were prepared in a 10-mm diameter and 4 mm thickness. Thirty cylindrical specimens (9 × 3 mm) were fabricated in a nickel-chromium alloy (Kera-N) and thirty in feldspathic porcelain (Ceramco). Metal (M) and porcelain (P) specimens were embedded in a polyvinyl chloride (PVC) mold and three different composite resins applied to the central region of the specimens.One of the following metal-ceramic repair systems (n = 10): Clearfil Ceramic Repair System/Clearfil AP-X (Kuraray), Ceramic Repair System/Tetric Ceram (Ivoclar Vivadent), Ceramic Repair System/Amolegen Plus (Ultradent). The specimens were stored in distilled water for 24 h at 37°C, thermal cycled (1000 cycles at 5°C to 55°C), and stored at 37°C for 8 days. Shear bond tests between the metal or ceramic specimens and repair systems were performed in a mechanical testing machine with a crosshead speed of 0.5 mm/min.
Results: Mean shear bond strength values (MPa) were submitted to one-way ANOVA and Tukey HSD significant difference tests ($\alpha = 0.05$).
Conclusions: The bond strength for the metal substrate was significantly higher using the Kuraray Ceramic Repair System (32,8810) and was significantly lower using Ultradent Ceramic Repair Kit(8,7710). For porcelain Kuraray Ceramic Repair System (43,3010) showed the highest shear bond strength values, and Ivoclar Vivadent Ceramic Repair system showed the lowest values (33,9610).

FC201

Evaluation of Bond Strength of Two Self-Etching Agents After Different Laser Etching

Abdül Semih Özsevik[1], Emine Şirin Karaarslan[1], Samet Tosun[1], Derya Gürsel Sürmelioglu[1], Ertan Ertaş[2], Aslıhan Üşümez[3]
[1]Department of Restorative Dentistry, Gaziantep University, Gaziantep, Turkey, [2]Department of Restorative Dentistry, Ondokuz Mayis University, Samsun, Turkey, [3]Department of Prosthodontics, Bezmialem University, Istanbul, Turkey

Aim: The aim of this study was to compare the microtensile bond strengths (μTBS) of two different self-etching adhesives on sound dentin following Er:YAG laser etching two different with pulse modes.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Materials and methods: Thirty extracted human third molars were used and the enamel surfaces were removed to expose a flat occlusal dentin surface. All the dentine surfaces were ground with 600-grit silicon carbide paper under running water. The teeth were randomly divided to two groups according to the etching procedures; I: No etching (control), II: Er:YAG laser etching by with MSP mode (100 μs), III: Er:YAG laser etching by with QSP mode. Then, each group was divided into two subgroups according to bonding agents (Single Bond Universal and Clearfil S3). The teeth were restored with nanohybrid composite resin (Filtek Z550). Five 1 mm^2 stick-shaped microtensile specimens from each tooth was prepared with a slow-speed diamond saw sectioning machine fitted with a diamond-rim blade (n = 25 specimens). All samples were submitted to micro-tensile bond test. Statistical analysis was performed with analysis of variance followed by Tukey HSD tests.
Results: There were statistically significant differences between Er:YAG laser-etched and control groups ($p < 0.05$). Irrespective of the laser pulse modes one-step self-etch adhesives showed the highest μTBS to dentin in all etch groups ($p < 0.05$).
Conclusion: In this study the results obtained demonstrated that the μTBS of laser-etching increased the tensile bond strength of one-step self-etch adhesives. The additional application of Er:YAG laser etching while using a one-step bonding systems can be recommended to increase the tensile bond strength.

FC202

Evaluation of Premature Contacts and Occlusal Balance of Complete Dentures

Duygu Kürklü, Funda Bayındır, Nuran Yanıkoğlu
Atatürk University Faculty of Dentistry Prosthodontics

Purpose: The aim of study is to evaluate premature contacts and occlusal forces for each tooth in complete dentures before occlusal adjustment.
Material and methods: The study population comprised 30 subjects (aged 50–75). The measurements were performed using the T- Scan® III (Tekscan Inc., South Boston, MA, USA). The occlusion was analyzed in before and after frames which from the T-scan "Force Movies" are Centric Relation (CR) bite recordings. And before and after frames showed premature loadings and the balance of occlusal forces with T- Scan's red "Center of Force" (COF) icon pinpoints. Several practices closures were made until a repeatable pattern of contacts was seen on the video monitor and sensor was calibrated. Each subject was asked to bite on the sensor in a position of maximum intercuspation thus obtaining the location of each tooth contact. Premature contacts and percentage distribution of forces per tooth were obtained before and after occlusal adjustment.
Results: The worst occlusal balance was recorded in a patient (F/74) by occlusal force values at right 5.9% and left 94.1% before occlusal adjustment. After occlusal adjustment, all patients' percentage of occlusal balance values were adjusted at average of 48.8%, left 51.1%. The percentage distribution of forces per tooth results showed that premature contacts has been observed at posterior teeth either right or left side of occlusion. Occlusal adjustment is requested for all complete dentures to prevent patients from muscular pain and/or temporomandibular disorders for further terms.

FC203

Microshear Bond Strength of Preheated Silorane-Based Composite Resin to Dentin

Muhammed Çayabatmaz[1], Sezer Demirbuğa[1], Yahya Orçun Zorba[1], Faruk İzzet Uçar[2]
[1]*Department of Restorative Dentistry, Erciyes University, Kayseri, Turkey,* [2]*Department of Orthodontics, Erciyes University, Kayseri, Turkey*

Objective: To investigate the effect of preheating on microshear bond strength of silorane-based composite resin to human dentin.
Materials and methods: One hundred freshly exracted third molar teeth were randomly divided into three groups; 1. composite resins were heated to 60 °C using a heater, 2. in a refrigerator composite resins were cooled to 4 °C 3. no pre-heating or pre-cooling was performed and served as control. Each group was then randomly subdivided into four groups according to adhesives used; a. two-step total etch, b. one-step self etch, c. two-step self etch and d. a silorane adhesive system (SAS). Resin composite cylinders were formed (0.9 mm diameter × 0.7 mm length) using a siloran-based and a methacrylate-based composite resin. Microshear bond strength of each specimen was tested using a universal testing device. Statistical analysis was performed using twoway ANOVA and Chi-square tests.
Results: While the preheated groups exhibited statistically higher bond strength values than control groups ($p < 0.001$), pre-cooling groups exhibited the lowest bond strength. The bond strength of SE bond was higher than the other adhesive systems ($p < 0.001$). SAS had the highest microshear bond strength. There was no statistically significant difference in microshear bond strength between All-Bond SE and Solobond M ($p > 0.05$).
Conclusion: Within the limitations of the present study, preheating procedure increased the microshear bond strength of silorane-based composites as well as methacrilate-based composite resins to dentin.

FC204

Radiopacity of Flowable Composite Resins

Rabia Banu Ermis[1], Derya Yıldırım[2], Gul Yıldız[1], Ozlem Gormez[2]
[1]*Department of Restorative Dentistry, Faculty of Dentistry, Suleyman Demirel University, Isparta, Turkey,* [2]*Department of Dentomaxillofacial Radiology, Faculty of Dentistry, Suleyman Demirel University, Isparta, Turkey*

Aim: The radiopacity of flowable composite resins (FCRs) is an important clinical property because one of the common uses of FCR is as a liner in class I and II restorations. The aim of this study, therefore, was to evaluate the radiopacity of light-curing FCRs and to compare them with the radiopacity of enamel and dentine.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Materials and methods: Seven light-curing FCRs with a filler content by weight between 41% and 71% were investigated. Fifteen specimens of the materials with thicknesses of 2 mm were prepared and radiographed alongside an aluminum stepwedge, human enamel and dentin. Three standart occlusal radiographs for each material were taken, with exposure time of 0.32 s and focus-film distance of 40 cm. Films were processed in an automatic device, and digitized using a desktop scanner. Gray-scale values of the materials, stepwedge, enamel and dentine were measured using Image J software. The data were analysed using ANOVA and Duncan multiple range tests.
Results: The decreasing values of radiopacity of the studied materials were: G-aenial Flo (38.38 ± 1.47), Filtek Ultimate (31.88 ± 1.45), Flowline (31.41 ± 1.60), Estelite Flow Quick (31.30 ± 1.99), Leaddent Flow (31.20 ± 1.32), Supraflow (28.13 ± 0.95), and Bright Light Flow (26.61 ± 1.45). All materials, except Bright Light Flow, demonstrated significantly greater radiopacity values than 2 mm of the aluminum scale and dentin ($p < 0.05$). The radiopacity of only one material, G-aenial Flo, was found to be significantly higher from enamel ($p < 0.05$).
Conclusions: All materials had radiopacity values above 2 mm of aluminium recommended by ISO 4049.

FC205

SEM Investigation of the Enamel Surface after Laser Assisted Tooth Bleaching

Marija Stevanovikj, Elizabeta Georgievska, Meri Pavlevska, Mira Jankulovska, Sonja Elencevska
Faculty of dentistry University of St. Cyril and Methody, skopje, Macedonia

White and well aligned teeth are one of the most common demands in the dental offices. Some types of lasers can be used during the bleaching procedure.
Aim: To investigate changes of the enamel surface after bleaching with Nd:Er:YAG laser and the potential of commercial paste consisting bioactive glass for remineralization of the enamel.
Material-method: 12 extracted human teeth were divided in two groups:

I group: 6 teeth treated with bleaching gel (16% carbamide peroxide), irradiated with Nd:Er:YAG laser. Laser parameters: pulsating mode, 60 Hz frequency and 8W energy. Paste with bioactive glass was applied at the end of each treatment. Teeth were prepared with the standard procedure for SEM investigation. Each tooth was analysed with SEM.

II group: 6 teeth treated with bleaching gel (16% carbamide peroxide) and paste with bioactive glass was applied at the end of each treatment. Teeth were prepared with the standard procedure for SEM investigation. Each tooth was analysed with SEM.
Results: Application of 16% carbamide peroxide caused demineralisation of the enamel. Acceleration of the bleaching process with NdYAG laser caused deeper damage and demineralization of the enamel. Application of paste with bioactive glass on the enamel surface caused forming of protective layer of deposits of bioactive glass on the tooth surface in both groups.
Conclusion: Acceleration of the bleaching process with the Nd:Er:YAG laser could cause severe damage of the enamel. Remineralising pastes should be used after bleaching in order to repair the damage to the mineral tissue caused by bleaching procedures.

FC206

The Effect of Photo-Activated Disinfection (PAD) on Microshear Bond Strength of Adhesives

Sezer Demirbuğa, Yahya Orçun Zorba
Department of Restorative Dentistry, Erciyes University, Kayseri, Turkey

Objective: The aim of this study was to evaluate the effect of a new disinfection method, FotoSan on microshear bond strength of adhesives in dentin.
Materials and methods: In this study 84 freshly extracted third molars were used. Removing the cusps, flat dentin surfaces were obtained. After achieving standard smear surfaces using carbid papers, the teeth were divided four main groups; 1: 2% Chlorhexidine, 2: 5% NaOCl, 3: PAD and 4: Control. Each group was subdivided accordind to adhesive systems used; a- Two-step self etch adhesive, Clearfil SE Bond, b- One-step self etch adhesive, Adper Easy One, c- Two-step total etch adhesive, Adper Single Bond 2. After disinfection and adhesive prosedures a Microhybrid composite resin, Clearfil APX was used to make composite cylinders using 0.75 mm of diameter tygon tubes. The microshear bond strength of samples were measured in a universal testing machine after 24 h. The failing surface of samles were evaluated under steriomicroscope and SEM. Statistical analysis was evaluated using Kruskal-wallis, Mann-Whitney U and Chi-square tests.
Results: There was no statistically significant difference between Chlorhexidine, NaOCl and control; PAD showed statistically significant lower microshear bond strength than others ($p < 0.005$). Among the adhesives, there were also significant differences ($p < 0.001$). While Clearfil SE Bond showed high values, Adper Easy One and Adper Single Bond followed this, respectively.
Conclusion: PAD reduced the microshear bond strength of adhesives in dentin. Clearfil SE Bond showed high microshear bond strength among the adhesives.

FC207

Development of a New Aproach to the Periodontal Regeneration

João Requicha[1], Isabel Leonor[2], Fernando Muñoz[3], Tiago Moura[4], Jorge Azevedo[5], Pedro Carvalho[1], Maria Anjos[6], Rui Reis[2], Manuela Gomes[2], Carlos Viegas[1]
[1]3B's Research Group - Biomaterials, Biodegradables and Biomimetics, University of Minho, Guimarães, Portugal. Department of Veterinary Sciences, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal. ICVS/3B's - PT Government Associate Laboratory, Braga/Guimarães, Portugal, [2]3B's Research Group - Biomaterials, Biodegradables and Biomimetics, University of Minho, Guimarães, Portugal. ICVS/3B's - PT Government Associate Laboratory, Braga/Guimarães, Portugal, [3]Faculty of Veterinary, University of Santiago de Compostela, Lugo, Spain,

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

[4]*Department of Veterinary Sciences, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal,* [5]*Centre for Studies in Animal and Veterinary Sciences, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal,* [6]*Department of Veterinary Sciences, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal. Centre for Studies in Animal and Veterinary Sciences, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal*

Aim or purpose: Periodontitis is highly prevalent in humans. As the current therapies are often inefficient, even bone grafts or growth/differentiation factors, Tissue Engineering (TE) could an alternative. Thus, a tissue-engineered double layer scaffold (DLS) based on starch+poly-caprolactone (SPCL) enriched with adipose stem cells (ASCs) was developed for periodontal regeneration.
Materials and methods: A SPCL membrane which aims at acting as GTR barrier, and a wet-spun fibre mesh without and with osteoconductive silanol groups were combined to obtain the DLS. DLS was characterized by Fourier Transmission Infra-red (FTIR), scanning electron microscopy (SEM), mechanical and degradation tests.

Canine ASCs were seeded/cultured onto the scaffolds and then characterized by MTS, DNA quantification, SEM, PCR and ALP quantification. The same cells were subcutaneously transplanted in mice and assessed the host response.

Ultimately, DLS were implanted in a mandibular rodent defect and compared to collagen commercial membranes. After 8 weeks, new bone formation was quantified by the Donath technique.
Results: Functionalization with silanol groups was confirmed by FTIR. DLS exhibited adequate tensile strength and degradability and provided a good support for canine ASCs adhesion and proliferation. SPCL-DLS-Si revealed higher expression of osteoblast genes. These cells also did not induce any immunogenic reaction in the host.

Histomorphometry revealed that SPCL-DLS-Si induced higher bone formation compared to collagen.
Conclusion: SPCL-DLS-Si bioactive matrix with the canine ASCs revealed good potential to be used in periodontal and bone TE strategies, and could also be proposed in non-autologous canine preclinical studies before human clinical applications.

FC208

The Effect of Three Different Blood Stoppers on Microshear Bond Strength of Self Etch Adhesives

Yahya Orçun Zorba[1], Sezer Demirbuğa[1], Mustafa Aydınbelge[2], Muhammed Çayabatmaz[1]
[1]*Department of Restorative Dentistry, Erciyes University, Kayseri, Turkey,* [2]*Department of Pedodontics, Erciyes University, Kayseri, Turkey*

Objective: To evaluate the effect of the blood stoppers on microshear bond strength (μSBS) of self etch adhesives in dentin.
Materials and methods: Fifty extracted human third molars were used. Removing the cusps, flat dentin surfaces were obtained. The teeth were divided five main groups: 1. a plant based blood stopper (PBS); 2. an aluminium chloride containing hemostatic agent (AlCl3); 3.20% Ferric Sulfate (FS); 4. blood contamination (BC); 5. control. Then each group was subdivided into two groups according to adhesive systems used; a- Two-step self etch adhesive, b- One-step self etch adhesive. After contamination and adhesive prosedures a microhybrid composite resin was used to make composite cylinders using 0.75 mm of diameter tygon tubes. The microshear bond strength of samples were measured in a universal testing machine after 24 h. The failing surface of samples were evaluated under steriomicroscope and SEM. Statistical analysis was evaluated using Kruskal-wallis, Mann-Whitney U and Chi-square tests.
Results: There was statistically significant difference between ABS and other hemostatic agents both in one-step and two step self etch adhesive groups ($p < 0.05$). ABS contamination reduced bond strength of self-etching adhesives. Although AlCl3, FS, and BC reduced the mean μSBS, it was not statistically significant ($p > 0.05$). Interestingly, BC showed highest μSBS in all groups. Two-step self etch had higher μSBS than one-step self etch ($p < 0.05$).
Conclusion: ABS contamination reduced the bond strength of self-etching adhesives. When the blood stoppers are used to stop the bleeding, the prefering of two-step self etch is more suitable.

Free Communication Session 34 | B342 | 30.08.2013 | 09:00–11:00

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

FC209

Do Different Veneering Techniques Affect Mechanical Performance of Zirconia Framework?

Burcu Kanat[1], Erhan Çömlekoğlu[1], Mine Dündar Çömlekoğlu[1], Bilge Hakan Şen[2], Mutlu Özcan[3], Mehmet Ali Güngör[1]
[1]*Department of Prosthodontics, Ege University, School of Dentistry, Izmir, Turkey,* [2]*Department of Endodontics, Ege University, School of Dentistry, Izmir, Turkey,* [3]*Dental Materials Unit, Center for Dental and Oral Medicine, Clinic for Fixed and Removable Prosthodontics and Dental Materials Science, University of Zurich, Zurich, Switzerland*

Aim: To investigate the a)fracture resistance(FR), b)shear bond strength(SBS), c)flexural strength(FS), d)finite element analysis (FEA) of zirconia veneered with different methods.
Materials and methods: Zirconia frameworks (In-Ceram YZ,VITA Zahnfabrik) prepared (InLab,Sirona) as crowns, bars and discs ($N = 90$, $n = 10$) and veneered with one of the veneering methods: a) Layering (L)(VM9), b) Pressing (P)(PM9) and c) Multilayering (M)(Mark II). For crown specimens ($N = 30$) stainless steel dies (1 mm chamfer) were scanned (InEos). Multilayering was designed for M and reduced design (1 mm) was performed for L and P for veneer support. For bar ($1.5 \times 5 \times 25$ mm) and disc specimens (2.5×2.5 mm), zirconia blocks were sectioned. Layering and pressing procedures were fulfilled for L and P. The milled superstructures were connected with frameworks by adhesive resin cement (PanaviaF2.0,Kuraray) for M and photo-polimerized. Crowns were cemented (RelyX luting cement, 3MESPE). All specimens were stored in 37°C, 100% moisture for 24 h. Mechanical tests were performed (0.5 mm/min). Data were statistically analyzed (ANOVA,Tukey's, $\alpha = 0.05$). Fractured specimens were examined with SEM and FEA(Simufact.forming v11.0) was performed.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Results: Mean FR values (N±SD) were significantly different between L(6102 ± 1519), P(4117 ± 1083) and M(1900 ± 254) ($p = 0.00$). The mean SBS (MPa) of M(24 ± 4) was the lowest ($p < 0.002$) and no differences were found between L(35 ± 6) and P(32 ± 6) ($p > 0.05$). Mean FS values (MPa) of M(496 ± 96), P (538 ± 72) and L(496 ± 36) were not significant ($p > 0.05$). SEM revealed only adhesive failures for M while cohesive failures within ceramic and zirconia were seen for P and L after FR. FEA verified these findings.
Conclusion: Layering or pressing veneering techniques may reduce ceramic chippings, however multilayering technique might be ineffective to prevent chipping.

FC210

Effect of Different Mucosa Thickness on Stress Distrubition of Two Types Implant-Supported Overdenture Designs

Özgün Yusuf Özyılmaz, Filiz Aykent
Deparment of Prosthodontic, Selcuk University, Konya, Turkey

Objective: The aim of this study was to evaluate the effect of different mucosa thickness on the stress distrubition of two stud attachment systems for two implant-retained mandibular overdenture designs using photoelastic analysis.
Materials and methods: Six photoelastic models of an edentulous mandibular were fabricated with solitary two implants (4.0 × 11 mm) which were placed in the canine regions. The attachment systems studied were solitary ball and locator attachments. Both ball and locator groups were include three different models which had different residuel ridge height so that provided different mucosa thickness (1–1 mm, 1–2 mm, 1–4 mm). Static vertical force of 135 N was applied unilaterally (each in turn right and left side) to the central fossa of the first molars. Models were positioned in the field of circular polariscope to observe the distribution of isochromatic fringes around the implants and interimplant areas under loading. The photoelastic effects were monitored and recorded photographically.
Results: Ball attachment groups were observed higher stress values than locator groups under loading compared with different mucosa thickness each others. Both of attachment system produced the lowest stress values which had 1–1 mm mucosa thickness. The highest stres values were observed which was loaded-side implant for all groups.
Conclusion: This in vitro study suggested that the use of locator attachment could be advantageous for implant-retained overdenture with regard to optimizing stress and provide more uniform stress distribution. The thickness of mucosa influence to stress values on implants.

FC211

Effect of Insertion and Removal of Tooth Supported Overdentures on Retention Strength and Fatigue Resistance of two Commercially Available Attachment Systems

Sagar Jagdish Abichandani
Department of Prosthodontics, SDM College of Dental Sciences, Dharwad, Karnataka, India

Purpose: The main problem with semi-precision attachment retained prosthesis is that they need frequent servicing in terms of replacing the female component.
Aim: The aim of the study was to test the retention strength and fatigue resistance of Rhein OT cap and Ceka sagix attachment systems fabricated on the models.
Materials and methods: Rhein OT cap (micro) and Ceka sagix attachments were procured. Acrylic resin mandibular models fabricated with teeth embedded at overdenture positions. Bar framework with attachments were cast and cemented on the model. Denture fabricated on this model was subjected to universal testing machine (UTM Instron 5900 series) for retention and fatigue test. The retention strength was measured at various cycles namely 1440, 2880, 4320 and 5760 cycles to check for the loss of retention and development of fatigue on the basis of average number of removals and placements per day for 1,2,3 and 4 years respectively. The values were recorded and a graphical analysis was carried out.
Results: TWO-way ANOVA was used as part of the statistical analysis to compare the retention strength and fatigue resistance of both the attachment systems used.
Conclusion: Sagix and Rhein attachment systems showed adequate retention values upto the first 2–3 years (2880–4320 cycles). Fatigue test simulating 4 years of denture insertion and removal did cause subsequent reduction in the retention values but no component fracture of attachment systems.

FC212

Effect of Laser on the Bond Strenght between Zirconium-Oxide Ceramic and Dental Porcelain

Seda Keban, Halis Özsürmeli, Coşkun Yıldız, Burçin Vanlıoğlu, Yasemin Kulak Özkan
Department of Prosthodontics, Marmara University, Istanbul, Turkey

Purpose: Zirconia is a widely used strengthening core material for all ceramic systems which has advantages such as esthetics, biocompatibility and colour stability but bonding mechanism between zirconia and veneering ceramic is still unknown. The aim of this study is to evaluate the effect of Er-YAG laser on shear bond strenght (SBS) between zirconia framework and porcelain.
Materials and methods: Thirty samples with three different zirconia systems (Lava, ZirkonZahn, IPS e-max Zir-CAD) (7 mm diameter 3 mm thickness) were allocated in six subgroups according to the surface treatment procedures(conventional, laser); Lava with no surface treatment(st) (LC); Lava laser (LL), Zirkonzahn with no st (ZC); Zirkonzahn laser (ZL); IPS e-max Zir-CAD with no st (IC), IPS e-max Zir-CAD laser (IL). Er:YAG laser (2940 nm, 150 mj) was used for surface treatment. All zirconia specimens were processed with IPS e-max Ceram. SBS of specimens were tested using a universal testing machine at a crosshead speed of 1 mm/min.
Results: IC showed the highest SBS whereas ZL showed the lowest (18,965 MPa) value but the difference was not significant between subgroups ($p = 0.125$). The difference was statistically significant when the results were evaluated according the zirconium system

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

(p = 0.047). I groups exhibited statistically higher values than Z (p = 0.043). The difference between I and L were not significant.
Conclusion: As a result, type of zirconia did have an effect on bond strength between zirconia core and veneer ceramic despite of laser treatment.

FC213
Effect of the Dental Arches Morphology on the Masticatory Muscles Activities
Teresa Sierpinska[1], Piotr Jacunski[1], Joanna Kuc[2], Maria Golebiewska[2], Aneta Wieczorek[3]
[1]*Department of Dental Technique, Medical University of Bialystok, Bialystok, Poland,* [2]*Department of Prosthetic Dentistry, Medical University of Bialystok, Bialystok, Poland,* [3]*Department of Prosthetic Dentistry, Collegium Medicum of Jagiellonian University, Kraków, Poland*

Aim: The aim of this study was to assess the relationship between the morphology of dental arches and masticatory muscles activities in the group of healthy volunteers with full natural dentition
Materials and methods: Two-hundred healthy, fully dentate volunteers, Angle I class (F = 113, M = 87); 18–21 years of age were studied. To assess the masticatory system clinical examination was performed. Alginate impressions of both arches were taken and subsequently plaster models were prepared. They were morphologically analyzed. EMG of masseters, temporales, sternocleidomastoides and digastricies was performed to assess their activities in central occlusion and lateral movements.
Results: The width of maxillary arch was 27.0–44.0 mm (mean 33.4 ± 2.4) measured between teeth 13–23, and 36.2–57.3 mm (mean 47.2 ± 3.3) measured between teeth 16–26; the width of mandibular arch was 17.6–32.5 mm (mean 25.7 ± 1.8) measured between teeth 33–43, and 31.1–50.0 mm (mean 42.32 ± 2.8) measured between teeth 36–46; the length of maxillary arch: mean 121.0 ± 6.0, the length of mandibular arch: mean 112.9 ± 5.7; overbite: mean 3.1 ± 1.3, overjet: mean 2.3 ± 1.0. Significant correlations were found between the length of maxillary arch and temporalis muscles activity in central occlusion ($r = -0.225$; $p = 0.025$), and the length of mandibular arch and temporalis muscles activity in central occlusion ($r = -0.238$; $p = 0.028$).
Conclusion: The morphology of dental arches has only limited influence on masticatory muscles activities.

FC214
Effect-of-Silane Applied to Glass-Ceramics at Different Temperatures on Surface Structure and Bonding Strength
Tevfik Yavuz, Oğuz Eraslan
Department of Prosthodontics, Selcuk University, Konya, Turkey

Aim: The aim of this study was to evaluate the effect of different surface treatments on surface structure and shear bond strength of different ceramics.
Methods: 312-glass ceramic specimens were used totally including 96 specimens for shear bond strength and 8 specimens for AFM for each ceramic systems. For shear bond strength, ceramic specimens embedded to clear acrylic resin were firstly divided into two groups according to be used resin cements and later divided into four groups according to surface treatments:G1(hydrofluoric-acid+silane), G2(silane under/in the circumstances), G3(silane alone then dried with warm air(60°C), G4(silane alone then dried with warm air(100°C). After the surface treatments, VariolinkVeneer N and Clearfil Esthetic light cured resin cements were manipulated onto ceramic discs in all groups with compatible mold. The final stage, surface treated glass ceramic specimens were observed with SEM and AFM.
Results: Bond strength values of G1 group were statistically higher than the other groups in IPS-Empress e.max and Finesse All-ceramic systems and bond strength values of silane dried with 100°C-warm air and G1 group were statistically higher than silane dried under/in the circumstances and 60°C warm air in Vita-In-ceram Zirkonia. While there were no significant differences in bond strength between silane dried with warm air (Group 3–4), bond strength values of silane dried with warm air (Grup 3 ve 4) are statistically higher than silane dried under/in the circumstances and lower than HF+silane group in IPS-Empess e.max and Finesse-All-ceramic specimens.

AFM and SEM images showed changes in three different glass ceramic specimens surface topography after surface treatments.

FC215
Laser-Assisted Treatment of TMD
Julia Emil Kamenoff[1], Julia Emil Kamenoff[2]
[1]*Medical University, Sofia,* [2]*Faculty of Dental Medicine, Sofia*

Summary: Introduction Recent years have dictum: "laser + TENS + Magnet = success", but there remain many unresolved issues.

The aim of this work is to explore the possibilities for laser-assisted treatment of TMJ disorders.
Materials and methods: Objects of study: 600 patients (300 women and 300 men) mean age of 47 years. Patients are selected on the main clinical sign TMJ pain. Methods of laser therapy: PBM – Laser Acupuncture, FIFBM, Biosynergetics approach and Complex Therapeutic Program (CTP). Laser devices - Combined Low-energy diode laser system and High power diode laser system $-\lambda = 980$ nm.
Evaluation of results: A specific diagnostic approach under the Signal Detection Theory is applied.
Results and discussion: The results of the theoretical and practical studies on the effect of laser irradiation in the case of TMJ disorders show high therapeutic efficacy of combined laser therapy. Randomised clinical observations confirm that TENS is a door for red acupuncture and low intensity red laser radiation is a gateway for infrared laser light.
Conclusions: Laser - assisted treatment of TMJ disorders has a high therapeutic efficacy and can find wide application in daily dental practice. The author offers its own original method for the treatment of acute and chronic disturbances in the TMJ - a Complex Therapeutic Program.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

FC216

Prevalence of Temporomandibular Joint Disorders among the Dental Students

Zeliha Şanıvar, Zeynep Aktaş, Seda Keban, Halis Özsürmeli, Coşkun Yıldız, Yasemin Kulak Özkan
Department of Prosthodontics, Marmara University, Istanbul, Turkey

Aim: The aim of the study was to evaluate the prevalence and severity of temporomandibular disorders (TMD) among to students who were in Marmara University Faculty of Dentistry class 1 and 2.
Materials and methods: Information about the symptomps of TMD and the possible risk factors were collected using standardized Research Diagnostic Criteria for TMD (RDC/TMD) Axis I and II. In this study 140 Students were examined (60 male and 80 female) with an age range from 18–23 years. The prevalence and severity of TMD was determined using RCD/TMD scoring and assesment.
Results: The results of the present investigation showed that pain in cheeks (masseter religons) was the most prevalent symptom whereas locking of the temporomandibular joint (TMJ) was the least prevalent. Nearly two-third of the examinated samples (66.4%, 93/140) had no symptomps of the TMD whereas 33.6% (47/140) had at least one symptomp. İt was interesting that bruxism was common habit among the students.
Conclusion: A low prevalence TMD was found in this student populations, but the bruxism was common which help the signify the role of stress and/or progression of TMD.

FC217

Micro CT Evaluation of Air Bubbles in Luting Cements after Cementation

Meral Arslan Malkoç[1], Müjde Sevimay[2], İlkan Tatar[3], Hakan Hamdi Çelik[3]
[1]*Department of Prosthodontic Dentistry, Faculty of Dentistry, İnönü University, Malatya, Turkey,* [2]*Department of Prosthodontic Dentistry, Faculty of Dentistry, Selcuk University, Konya, Turkey,* [3]*Department of Anatomy, Medical School, Hacettepe University, Ankara, Turkey*

Aim: To evaluate air-bubble volume and localization in cements under fixed dental prosthesis using micro computed tomography (CT).
Material-Method: Seventy seven sound molars were circumferentially prepared in order to receive all-ceramic crowns. IPS e.max ceramic copings were fabricated according to the manufacturer's instructions. Eight different resin based (Variolink II, Rely X ARC, Clearfil Esthetic, Bis Cem, Rely X U 100, Panavia EX, Super Bond C&B, and Multilink Automix) cements, one resin modified glass ionomer (Ketac Cem Plus), one glass ionomer (Ketac Cem), and one polycarboxylate (Durelon) dental-luting cement was used. Each specimen was scanned with a Micro CT (SkyScan). Statistical analyses were performed using the Kruskal–Wallis 1-way ANOVA and Bonferroni's adjusted Mann-Whitney U tests.
Results: Multilink Automix and Ketac Cem Plus contained at least air bubbles ($p < 0.001$). Variolink II demonstrated no significant difference in the amount of air bubbles compared to Multilink Automix and Ketac Cem Plus ($p > 0.05$). However, the volume and surface area of the air bubbles found in the other tested luting cements was significantly greater than that of Multilink Automix, KetacCem Plus, and Variolink II ($p < 0.001$), all of which demonstrated no significant differences ($p > 0.05$).
Conclusion: The liquid and powder forms prepared by manually mixing cements were found to cause more air bubbles. The paste form of the resin based luting agents has the potential to decrease the formation of air bubbles under the complete ceramic crown.

Theme: Dental Treatment & Restorative Dentistry: Materials

FC218

A Comparison of Accuracy of Four Different Impression Materials

Ayşe Gözde Türk[1], Mübin Ulusoy[1], Şükrü Mert Yüce[1], Sena Ünal[1], Tolga Bıçakcı[2]
[1]*Department of Prosthodontics, Ege University, İzmir, Turkey,* [2]*Private Practice, İzmir, Turkey*

Aim: The purpose of this study was to compare the marginal accuracy of metal casts processed with four different impression materials.
Methods: An extracted premolar tooth was prepared with a 1 mm circumferential chamfer finishing line. Stone casts of this master model were produced by four different impression materials: Speedex (Coltane/Whaledent, Switzerland), Zhermack Elite HD (Badia Polesine, Rovigo, Italy), Affinis Precious (Coltane/Whaledent)and Pentamix (3M ESPE, Seefeld, Germany). For every impression group, 20 metal copings (Remanium CS, Dentaurum, Germany) were produced. A light body silicone impression material (Zhermack Elite HD fast set) was used for the replicas of the tooth-metal coping space. Overall 12 measurements per replica were made under a light microscope (X40) by Leica QWin image analysis software, in order to assess the vertical marginal gap. After normality (Kolmogorov-Smirnov) and homogeneity (Levene) tests, marginal accuracy measurement mean values were submitted to one way analysis of variance (ANOVA) and in case of significant, further statistical analyses were performed by Tukey multiple comparisons test (alpha = 0.05).
Results: The mean vertical marginal gaps were found 118.1 μm in Speedex, 117.43 μm in Zhermack, 88.7 μm in Affinis and 157.07 μm in Pentamix groups. The Affinis group had the smallest ($p = 0.00$) and the Pentamix group had the highest marginal gap value ($p = 0.00$) between the test groups. Speedex and Zhermack groups did not differ significantly ($p = 0.83$).
Conclusion: Affinis impression material seemed to have more accuracy than the other elastomeric impression materials whereas, Pentamix was found to be less accurate.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Free Communication Session 35 | B343 | 30.08.2013 | 09:00–11:00

Theme: Dental Treatment & Restorative Dentistry: Endodontics

FC219

Long Term Follow up for Replanted Tooth (remained extraorally from 7 days) with Success Case Report

Abdlmonem Mabrok Aljibani

Cairo Dental School Bds 1972 Egypt, Britol Dental School Msc 1980 Uk, Prage Dental School Phd 1990 Chekoslovakia, Dean Of High Medical Institute 1990 1995 Tripoli libya, Head Of Conservative Dep In Tripoli Dental School 1991 1995 Tripoli libya, Private Dental Clinic 1990 2013 Tripoli libya

Introduction: Replantation is not a new procedure, Based in research, dentistry guide line the extra oral time not to exceed 60 min, (Andreasen 1981, Urban et al. 1986).To data no case report can be found for a tooth, remained 7 days extra orally in dray storage

Methods & Treatment: A young lady age 32 years came with avulsed tooth no 11 since 7 days extraorally. Tooth washed with chloro hexadine gluoconate 20%, instrumentation &obturation using glass inomer cement& honey sidr covered the tooth before replantation.Fixation using composite with adjacent teeth and course of augmentin 375 mg tds, analgesic sos, mouth wash for 5 days.

Results: Follow up for the case 3 & 6 years, showed clinical and radiographic success since no apical or cervical resorption shown.

Discussion: Knight etal 1964 reported that, treated pulp in dogs showed better tissue acceptance while untreated not, Andreasen1981 in the contrary, reported that, inflammation of root resorption increases with increased extra oral time.

Conclusion: Multiple factor responsible for the success or failure of Replantation depends on material of obturation, honey during Replantation, fixation, with this case& care from the Pt.

FC220

Platelet Rich Fibrin: A Newer Approach for Regenerative Endodontics

Neelam Mittal

Faculty of Dental Sciences, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

Aim: To evaluate the role of Second Generation Platelet Concentrate (PRF) as a scaffold in inducing apexogenesis in necrotic immature permanent teeth

Materials and methods: Necrotic immature permanent anterior teeth were selected and randomly divided into three groups. Under rubber dam isolation, access cavity was prepared. Minimal filing and copious irrigation with 2.5% sodium hypochlorite solution was done. Triple antibiotic paste was placed in dried root canals for further disinfection and the access cavity was sealed with temporary restorative material for four weeks. At recall appointment, the root canal was irrigated and blood clot, PRP, and PRF were used as scaffolds and placed in dried root canals in different patients. Access cavity was then sealed with adhesive restorative material. Patient were recalled for evaluation after 6 and 18 months of placement of scaffold

Result: PRF showed significantly better results in terms of periapical healing, root lengthening, and dentinal thickening when compared to PRP and blood clot in inducing apexogenesis in immature teeth.

Conclusion: Revascularization is a biologically based, more effective and conservative approach over apexification for necrotic immature permanent teeth. Platelet rich fibrin is a storehouse of growth factors which are released in a slow and continuous fashion thus improving their usefulness in the regenerative procedure, however its use in human clinical studies in the field of regenerative endodontics has been very limited. In this study, Platelet rich fibrin, as a scaffold, shows higher potential for regeneration, as compared to platelet rich plasma and blood clot.

FC221

Self-Adjusting File Separation during Clinical Use: An International Survey

Michael Solomonov[1], Joe Ben Itzhak[1], Anda Kfir[2], OscarVon Stetten[3], Elena Lipatova[4], Eleftherios Terry R. Farmakis[5]

[1]Department of Endodontics, Sheba Hospital, Tel Hashomer, Israel, [2]Department of Endodontology, School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel, [3]Private practice, Stuttgart, Germany, [4]Private practice, Ekaterinburg, Russia, [5]Department of Endodontics, Dental School, University of Athens, Athens, Greece

Aim: Unexpected file separation is a major limitation of nickel-titanium rotary files. The self-adjusting file (SAF) has been claimed to be highly resistant to file separation, based on laboratory studies. The aim of this survey was to establish the frequency of SAF file separation during clinical use and to study the retrieval or bypass methods that have been used by operators in such cases.

Materials and methods: A questionnaire was sent to SAF users to make the following inquiries: (a)How many SAF files had they used so far? (b)How many cases of SAF file separations had they encountered? (c)How many of the separated files were retrievable? (d)How many of the non-retrievable separated files could be bypassed? Only responses from operators who had used 50 SAFs or more were included in the present study.

Results: The questionnaires received from 15 SAF users fit the inclusion criteria. These operators had used between 50 and 550 SAFs each. A total of 2517 SAFs had been used by these operators, and 15 cases of file separation had occurred (0.6%). Twelve of these separated files (80%) could be retrieved using Hedström files. In the three cases in which the separated file could not be retrieved, the separated file segment was successfully bypassed. The treatment was completed, and the canal was obturated through the separated SAF.

Conclusions: The incidence of SAF file separation in clinical use was very low, and in all such cases, the separated file was either retrievable or could be bypassed.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

FC222

Management of Pulpless Teeth with Immature Apices – A Clinical & Radiographic Study

Surendra Kumar Mishra[1], Rajendra Kumar Tewari[1], Ashok Kumar[1], Rajat Pratap Singh[2]
[1]*Department of Conservative Dentistry & Endodontics, Dr Z A Dental College, AMU, Aligarh, UP, India,* [2]*The Gentle Dental Home*

Aim: Aim of Study:To clinically and radiographically evaluate the periapical healing/maturogenesis in endodontically treated teeth with immature apices by calcium hydroxide, mta & revascularisation procedure.
Methodology: Twenty-two cases of nonvital teeth with immature roots were selected. After working length determination canals were prepared with hand instruments, irrigated with 3% sodium hypochlorite & dried. In 10 cases apexification was done with mta, 10 cases were completed using calcium hydroxide and in two cases maturogenesis was attempted by revascularization.
Results: All teeth were evaluated after 1 week, 3 months & 6 months interval. After 1 week all teeth were asymptomatic and sinus was completely healed. After 3 months 100% of mta cases showed good calcific barrier formation & osteogenic repair while 80% of calcium hydroxide cases showed peri-apical repair after 6 months to a period of more than a year and 50% of revascularization cases showed root development after one year.
Discussion: Management of nonvital teeth with immature apices has always been a challenge. Earlier such cases were managed with multiple appointments using calcium hydroxide, hoping for creation of calcific barrier against which permanent filling could be placed. But in this way treatment may take more than a year. Currently mta has proved to be a better solution for apexification & successful periapical healing as an alternative in a relatively short period of time with favorable histological response. The recent concept of revascularization is a new hope for apexogenesis but only few cases have shown promising results so further research is needed in this regard.

FC223

The Role of Apical Surgery in Guided Tissue Regeneration

Ayse Nazli Ozgun, Ioana Pop, Cathy Bryant
King's College Hospital, London, UK

Aim: This case series aims to demonstrate the benefit of using guided bone regeneration in the management of non-healing apical pathology following conventional endodontic treatment. In cases where the periosteum overlying the bony defect is not intact, a Bio-Gide® membrane was used to prevent soft tissue ingress.
Methods: Apical surgery with the use of guided bone regeneration was performed on patients using a standardised microsurgical approach.

A three sided buccal mucoperiosteal flap was used and approximately 3 mm of the root end was resected at 90 degrees using a surgical handpiece. The defect was debrided and the root surface inspected for cracks, isthmuses, deltas and accessory canals using an operating microscope. An ultrasonic retro tip was used to prepare a 3–4 mm root end cavity which was then sealed using a mineral trioxide aggregate material. A suitably shaped membrane was then prepared and placed between the bony defect and the overlying soft tissue flap which was repositioned with 5/0 vicryl rapide vertical mattress sutures. Patients were reviewed post-operatively to assess healing.
Results: The patients were asymptomatic and displayed good healing on review at one week, three/six months and up to 2 years post-operatively.
Conclusion: The use of an evidence based microsurgical approach combined with guided bone regeneration may promote bony healing within an apical defect.

As well as maintaining optimal alveolar bone level, this will be advantageous even in the event of a subsequent restorative failure necessitating the removal of the tooth and its replacement with an implant retained restoration.

FC224

Tooth Discoloration Induced by Different Dental Materials

Tringa Kelmendi, Veton Hoxha, Nexhmije Ajeti
Department of Dental Pathology and Endodontics, University of Prishtina, Prishtina, Kosova

Aim: The aim of this study was to evaluate the discoloration of tooth caused by different dental materials.
Materials and methods: The 45 mature extracted teeth were separated into eight experimental groups (1 group = 10 teeth) and a control group consisted of five teeth. Five teeth of each experimental group were filled over CEJ and five other teeth bellow CEJ. As a materials were used: group 1: Endomethason (Septodont-France), group 2: AH+(Topseal® Integral set, A0900, Dentsply - Maille), group 3: Canason (Vocco, Germany) and group 4: Apexit (Ivoclar, Vivadent). Group control teeth were filled with saliva. After the canals were obturated they were closed with temporary filling (I-Pro-Europe). Than tooth were placed on tube-test Ependorfit. The teeth color was measured with a spectrophotometer Vita Easyshade® (Germany), prior to the endodontic treatment (baseline) after 24 weeks and 1 year. The CIE l*a*b* system was used.
Results: With T-test have not gained significant difference in yellowness between groups and control groups in any of the weeks ($p > 0.05$) with the exception of group 5 with the control group after one year ($p < 0.03$).

Regarding the degree of lightness after a year have gained significant difference between group 1, 2, 5, 6, 8 and control group ($p < 0, 01$).
Conclusions: All sealers caused a degree of tooth discoloration which increased with time. It was concluded that Endomethasone may cause discoloration of teeth, over and below the CEJ.

FC225

WaveOne NiTi Single File Reciprocating System for Root Canal Preparation

Mohammad Shamsul Alam
Bangabandhu Sheik Mujib Medical University

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Introduction: The new Wave One NiTi file system is a single use, single file system designed to shape the root canal completely from start to finish. The WaveOne system is an exciting new concept in the preparation of the root canal. In most of the cases the technique only requires one hand file followed by one single WaveOne file to completely shape the canal. There are three files in the WaveOne single file reciprocating system, available in small, primary and large in sizes. The instruments are designed to work with a reverse cutting action. The specially designed NiTi files work in a similar but reversed 'balanced force' action using a pre-programmed motor to move the files in a back and forth 'reciprocal action'. The files are manufactured with M-Wire technology improving strength and resistance to cyclic fatigue by up to nearly four times compared to other brands of rotary NiTi files. WaveOne files only shape the canal, extremely quickly in many instances, but they do not clean the root canal properly. It is the duty of clinicians and manufacturers to emphasize the role and importance of irrigation as a major determinant of endodontic success.
Conclusions: Once it is fully appreciated that shaping and cleaning the root-canal system are irrevocably intertwined, then endodontics will be easier for all and available to all, and WaveOne will truly become the root-canal preparation instrument of the future.

FC226

Fracture Resistance of Flared Canals Obturated with New Obturation Materials

Aziza Eldarrat[1], Salma Abdo[2]
[1]Sharjah University, [2]Al Tawam Hospital, Sharjah, UAE

Aims of the Study: To investigate fracture resistance of root canals obturated with new Nano-Hydroxyapitite (NanoHA) sealer and different obturation materials.
Methodology: Canals of 120 roots of mandibular premolars were over prepared. Then, the roots were randomly divided into eight groups, each group 15 roots. Groups 1 and 2 were used as controls. Root canals of groups 3, 4 and 5 were obturated with Gutta-Percha/NanoHA, Gutta-Percha/NanoHA plus composite and Gutta-Percha/NanoHA plus MTA, respectively. Root canals of groups 6, 7 and 8 were obturated with Resilon/Epiphany, Resilon/Epiphany plus composite and Resilon/Epiphany plus MTA, respectively. Fracture resistance of each group was measured using the Instron machine, after measurements, the fractured root samples were examined by Micro CT Scan and SEM.
Results: Comparing the mean values of fracture resistance for the experimental groups using ANOVA test, showed a significant difference ($p < 0.001$) among the groups. Mean value of the fracture resistance was the highest for Gutta-Percha/NanoHA plus MTA (1.5 ± 26 KN) and Resilon/Epiphany plus MTA (1.4 ± 20 KN). Statistically, the difference was found insignificant between the two groups ($p > 0.05$). Micro CT Scan and SEM showed that fracture pattern for MTA groups was a vertical line fracture, whereas for composite groups was several cracks over the entire root surface.
Conculsion: The result indicates that the use of MTA reinforces flared root canals. Fracture resistance of both Gutta-Percha/NanoHA plus MTA and Resilon/Epiphany plus MTA was similar. Nano–Hydroxyapatite sealer is economical and may be used as an alternative sealer with Gutta-Percha or Resilon plus MTA.

FC227

Evaluation of the Duration of Continuous Ultrasonic Irrigation in the Removal of Dentinal Debris in the Apical Third: An Experimental Study

İbrahim Ethem Yaylalı
Department of Endodontics, Gulhane Medical Academy, Ankara, Turkey

Aim: The purpose of the study was to evaluate the durations of continuous ultrasonic irrigation in the removal of dentinal debris from simulated apical holes.
Material-method: Thirty-two teeth with single root and canal were used. The teeth were randomly allocated into three groups ($n = 3$). The teeth were prepared to size 45/.04. After decoronation at the cementoenemal junction, three standardized holes were prepared at the apical third on the one side of the root. The holes were filled with dentinal debris and assembled again. The roots were irrigated using 2.5% sodium hypocholorite 30 s irrigation in Group 1 ($n = 11$), 60 s in Group 2 ($n = 11$), 90 s in Group 3 ($n = 10$) by using continuous ultrasonic irrigation. The samples were examined under 20× stereo microscope in that the amount of residiual debris in the holes by using four-grade scoring. Since the data were ordinal, nonparametric Kruskal-Wallis analysis of variance and Dunn test as post-hoc analysis were used.
Results: There was significant difference between the groups ($p = 0.035$). Debris removal was significantly better in Group 2 and Group 3 ($p < 0.001$). There were no difference between Group 2 and Group 3 ($p = 0.071$). The percents of complete removal of the debris were 26% in Group 1, 85% in Group 2 and 86% in Group 3.
Conclusion: Under the conditions of the study, duration of irrigation should not less than 60 s. By considering the effect of sodium hypocholorite on dentin hardness, the duration of irrigation might adjust to remove more debris from the root canal system.

Theme: General Dentistry and Oral Health

FC228

Effect of Insulin Growth Factor-1 and Bone Morphogenetic Protein 2on the Osteogenic Capability of Isolated Dental Pulp Stem Cells

Effat Ahmed Abbass[1], Mohamed Salah El Din Ayoub[2], Alice Abd Elaleem[3]
[1]Department of Basic Dental Science, National Research Center, Cairo, Egypt, [2]Department of Oral Pathology, Ain Shams University, Cairo, Egypt, [3]Department of Molecular Genetics, National Research Center, Cairo, Egypt

Aim: The aim of this study was to assess the effect of Insulin Growth Factor-1 and BMP2 on the osteogenic capability of isolated human dental pulp stem cells.
Methods: A population of clonogenic cells "stem cells" was isolated from the pulp tissue of adult third molar. These isolated cells were propagated in culture dishes and then characterized as being

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

the correct population of multipotent cells retaining the ability of differentiation into a variety of different cell types. Pulp stem cell characterization was done through studying specific morphological appearance. Osteogenic differentiation was performed when reached 70% confluency by culturing at two different experimental conditions. In all conditions, cells were cultured in αMEM containing FBS, penicillin-streptomycin and glutamax. Differently, the first group was supplemented with L-ascorbic acid 2-phosphate, β-glycerol phosphate and dexamethasone; in the second group, BMP-2 and IGF-1 were added. Assessment of osteogenic differentiation of hDPSC was done by Alizarin red staining at days 12 and 23 and immunocytochemical assay for osteocalcin.
Results: The first and second experimental conditions were shown to induce osteogenic differentiation; however the second condition indicated much less potential. As for the imunocytochemical assay result, it has been shown that both the first and second groups expressed osteocalcin. However, degree of expression in the first group is much exceeding the expression in the second group.
Conclusion: BMP2 and IGF-1 although can induce osteogenic differentiation of stem cells however, it is not as potent as routine chemicals used to induce the osteogenic differentiation.

Free Communication Session 36 | B360 | 30.08.2013 | 09:00–11:00

Theme: Implantology: Implantology

FC229
Do we Explain "the Dental Implant" Correcty to Our Patiens?
Emir Yüzbaşıoğlu[1], Halenur Bilir[1], Şükran Tüfekçioğlu[2], Umut Çakan[1], Hanefi Kurt[1], Çağrı Delilbaşı[2]
[1]Department of Prosthodontics, School of Dentistry, İstanbul Medipol University, İstanbul, Turkey, [2]Department of Oral & Maxillofacial Surgery, School of Dentistry, İstanbul Medipol University, İstanbul, Turkey

Objective: To determine patients' awareness, acceptance, knowledge, attitudes and percieved treatment need towards dental implants.
Methods: Patients' awareness, acceptance, knowledge, attitudes and perceived treatment need towards dental implants as an option in replacing missing teeth were evaluated through a standardized 42-item, closed-ended questionnaire. The study group consisted of adult patients aged 18–85 years, who were referred to outpatient clinic İstanbul Medipol University School of Dentistry for dental treatment. The questions about age, gender, education level, job, monthly income and oral hygiene status were asked to determine socio-demographic characteristics. Additional questions about level and source of information about dental implants, acceptance and perceived treatment need of dental implants as a treatment option were asked for variation factors. Patients' variable factors towards dental implants were analyzed with descriptive statistics.
Results: The majority of patients stated that level of information about dental implants is intermediate level and need more information. The patients' friends, their relatives and TV programs were main source of information about dental implants. The majority of patients stated that implants could be rejected by the body an allergic reaction for reason of failures of dental implants. The major refugal reason of dental implant theraphy were cost and lack of perceived necessity.
Conclusions: Attitudes of patients should be taken into consideration to improve patient compliance with and acceptance of this treatment modality. The awareness and acceptance of dental implants in the population might be increased by providing further and accurate information and promoting oral health in general.

FC230
The Effect of Shape Optimization of Platform Switching of a Dental Implant on Static, Dynamic and Fatigue Behavior by 3-D Finite Element Method
Emir Yüzbaşıoğlu[1], Oğuz Kayabaşı[2]
[1]Department of Prosthodontics, School of Dentistry, İstanbul Medipol University, İstanbul, Turkey, [2]Department of Mechanical Engineering, Faculty of Engineering, Gebze Institute of Techology, Kocaeli, Turkey

Objective: The aim of this study is to select optimum design of implant-abutment connection of platform switched implants which reduce stress at the bone-implant interface by using macro design and implant-abutment connection of dental implant during the life time of a patient and to prevent failure of the implant into the bone by using optimization algorithm.
Methods: In this study, an efficient, effective and automated design strategy is proposed to select optimum design of platform switched dental implant. In this strategy, finite element analysis, Approximate model and a numerical optimization algorithm are integrated to create an automated design tool. Using this approach, shape design of the dental implant is formulated in the form of an optimization problem that can be solved easily by a conventional numerical optimization algorithm.
Results: Although stress values at bone-implant interface has decrease by increased platform switched ratio of implant, stress values the fatigue life of abutment body is infused dramatically. Optimum abutment geometry found after 50 optimization iterations. To reduce the computational cost, optimization process was limited with 50 iterations. More iteration may provide a better design. The optimum shape minimizes the stress values at bone-implant interface and maximizes the fatigue life of the abutment
Conclusion: The design of dental implant and abutment assembly are a complex process that requires close co-operation between engineering and dentistry. Solution of the optimization problem leads to the optimum design. These findings can form a base for further research such as the optimum design of dental implant.

FC231
Evaluation the Accuracy of Two Implant Impression Techniques with Malposed Implants
Zeynep İrkeç[1], Ufuk Hasanreisoğlu[1], Hakan Terzioğlu[1], Kenan Köse[2]
[1]Department of Prosthodontics, Faculty of Dentistry, Ankara University, Turkey, [2]Department of Biostatistics, Faculty of Medicine, Ankara University, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: To compare the accuracy of direct and indirect impression techniques made with angulated implants or implants placed in close proximity.
Materials and methods: Two epoxy resin definitive casts were fabricated for each impression technique with four appropriate implant analogs arranged in a linear pattern. One of the casts incorporated parallel implants positioned in a standard distance. The other was obtained by changing either the angulation of implants or the distance between them (1st implant was angulated 15o medially, 2nd, 3rd and 4th implants were parallel to each other; 3, 2, and 1 mm distance between implants). Five impressions with closed or open custom trays were made from each epoxy resin definitive cast using polyether impression material. Following the transfer of analog positions, impressions were poured with type IV dental stone. Technically proper abutments were screwed and tightened to implant analogs in both epoxy resin and stone casts. Distortions in x, y coordinates and z axis were calculated using Coordinate Measuring Machine and Profile Projector respectively. Data were analyzed by one-way ANOVA and Mann Whitney U tests ($p < 0.05$).
Results: No significant differences were found between the direct and indirect techniques when implants were placed parallel to each other and in a standard distance. In case of malposed implants, direct technique displayed less distortion compared to the indirect technique in horizontal (x) and vertical (z) planes ($p < 0.05$).
Conclusion: Direct impression technique using polyether impression material exhibited a more accurate implant transfer when angulated implants and implants in close proximity were concerned.

FC232

Five-Year Clinical Evaluation Using Two Different Attachment Systems for Two-Implant Supported Mandibular Overdentures

Sadullah Üçtaşlı[1], Seçil Nigar Karadeniz[2]
[1]*Department of Prosthodontics,Ankara University, Faculty of Dentistry, Ankara, Turkey,* [2]*Department of Maxillofacial Surgery, Ankara University, Faculty of Dentistry, Ankara, Turkey*

Aim: The aim of this study was to compare two different types of attachment systems for two-implant supported mandibular overdentures opposed to complete dentures, focusing on costs, maintenance requirements and complications from baseline to the end of 5-year follow-up period.
Methods: Sixty mandibular and maxillary edentulous patients received two screw type Straumann standard tissue level, sandblasted large-grit acid-etched surface implants in the mandibular canine region. The implants were inserted under local anesthesia in one-stage non-submerged procedure according to protocol (Weingart and ten Bruggenkate 2000) by experienced surgeon. Two different types of attachment systems/retentive anchor were used as Group 1 ($n = 30$): ball attachment/gold matrix; Group2 ($n = 30$): locator atatchment/plastic matrix. The prosthetic procedure was performed by experienced prosthodontist. Occlusion was assessed both on the articulator and intraorally to secure balanced occlusion in centric relation without anterior tooth contact (Vercruyssen et al 2010). Prosthetic maintanence and complications (related to implant components, structure of the prosthesis and adjustments of prosthesis, including soft tissue problems) were assessed from baseline to 5-year. Prosthodontic success was evaluated with the aid of six-field table analysis proposed by Payne et al 2001 as success, survival, deceased, retreatment such as repair or replace. Statistical analysis were expressed as mean values, standard deviations and percentages using Pearson Chi-squared test and Fisher's exact test.
Results: Depending types of attachment systems on costs, there were statistically significant difference between ball and locator systems ($p < 0.05$) however did not show statistically significance both maintenance requirements and complications ($p > 0.05$). Attachment systems selection can be choosen by clinicians knowledge& experience.

FC233

Immediate loading of implants in edentulous mandibles with Locator® or Dolder®-bar: first results from a prospective randomized clinical study

Constantin Eiffler, Lydia Eberhard, Nikolaos Nikitas Giannakopoulos, Peter Rammelsberg, Stefanie Schwarz
Department of Prosthodontics, University of Heidelberg, Heidelberg, Germany

Objective: To evaluate survival and the incidence of complications for pairs of implants placed in the front of edentulous mandibles and immediately loaded with either bar or Locator® attachments.
Materials and methods: Forty-six patients (mean age 69.4 years; 73.9% male) with edentulous mandibles each received two immediately loaded implants in the interforaminal area of the symphysis. Immediately after implant placement, Dolder®-bar or Locator® attachments, allocated randomly, were attached, and both clips and a framework were incorporated in the denture by the dental technician. Within 72 h the implants were loaded.
Results: During a mean observation period of six months (maximum 24 months, SD 0.43) eight implants in five patients were lost. Survival was 93.5% in the Locator® group (group 1) and 89.1% in the bar group (group 2). Estimated cumulative survival after one year of function was 93.4% in group 1 and 87.1% in group 2. During the observation period 12 prosthetic complications required aftercare. No superstructure was lost or had to be remade because of prosthetic reasons, but 5 dentures had to be removed or reworked after implant failure. Survival of the original dentures was, therefore, 95.7% in group 1 and 93.5% in group 2.
Conclusion: Within the limitations of this study, immediate loading of two implants in the edentulous mandible supporting Locator® attachments might be a good treatment option for elderly patients. Further prospective, randomized clinical trials reaching the sample size necessary for a higher level of beta are needed to confirm this initial trend.

FC234

Strength Evaluation of Three Implant-Abutment Connection Under Compressive Loading

Azam Sadat Mostafavi[1], Saied Nokar[2], Habib Hajmiraga[2]
[1]*Department of prosthodontics, Zahedan University, Zahedan, Iran,* [2]*Department of prosthodontics, Tehran University, Tehran, Iran*

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Purpose: Biomechanical problems associated with dental implants have caused problems for both dentists and patients, in addition they are time-consuming and need extra cost. Screw loosening and fracture is one of these problems which we still face with it in clinical practice. The aim of this study is to better understanding of implant – abutment connection behavior in three different types of abutments in Implantium dental implant system under compressive loading.
Materials and methods: 18 implants (6 for each type of abutment) were divided in three groups (group 1: Dual abutment, group 2: Combi abutment, group 3: Direct Casting abutment). Abutments were tightened by Digital torque gauge and reverse torque values were recorded before loading. Then, a compressive load was applied to each sample, 30° off axes at the rate of 1 mm/min until the failure of sample was evident.
Results: reverse torque values were highest in group 2, followed by group 3 and both were significantly higher than group 1. ($P < 0.05$) the failure load difference between group 1 and 2 was not significant but both were significantly lower than group 3. ($P < 0.05$) in radiographic evaluation, all the samples showed deflection in the base of the abutment.
Conclusions: The more surface area in implant – abutment connection causes more adaptation between adjacent surfaces and maybe increases the cold weld probability. Separated screw in 2-piece abutment did not reduce the bending resistance in implant-abutment connection. Failure load values showed that all samples had enough strength to resist forces in the mouth.

FC235

Sinus Floor Elevation Using a Sintered, Natural Bone Mineral. A Histomorphometrical Case Report Study

Daniel Rothamel, Tim Fienitz, Matthias Kreppel, Arndt Happe, Joachim Zoeller
Department of Oral and Maxillofacial Plastic Surgery, University of Cologne, Cologne, Germany

Background: Implantological rehabilitation of the posterior maxilla often requires cranialization of the sinus floor to allow for long-term stability and permit the placement of sufficiently long implants. Well known as sinus floor elevation or sinus lift, this operation is one of the most common therapies for vertical deficits of the upper jaw.
Aim: The aim of the present study was the histological, histomorphometrical and clinical evaluation of a sintered xenogeneic bone substitute material (BEGO OSS, Bego Implant Systems, Bremen) for the indications one-stage and two-stage sinus floor elevation.
Methods: Twelve patients were included in the study, undergoing 15 simultaneous or staged sinuslift operations. Data were evaluated clinically and, for two-stage approaches, histologically and histomorphometrically after trephine harvesting during implant bed preparation.
Results: Healing was uneventful in all cases. All patients showed good hard tissue regeneration of the lateral window of the sinus. Neither resorption nor dislocation of the granular bone substitute material was observed. Radiologically, good volume stability of the graft was observed. Histologically, bone substitute particles displayed complete osseous integration in newly formed bone matrix. The proportion of newly formed bone within the graft was 25.8–49.6%, whereas the proportion of remaining bone substitute material varied from 28.6–38.5%.
Conclusion: It was concluded that BEGO OSS acts as an osteoconductive material to support hard tissue regeneration after sinus floor elevation. Showing excellent volume stability, it is integrated into newly formed bone matrix within a six-month healing period.

FC236

Labio-Lingual Dimensions Changes after Horizontal Bone Augmentation with Xenografts

Enis Fikret Ahmedi[1], Walther Wegscheider[2], Martin Lorenzoni[2], Jehona Ahmedi[5], Avni Robaj[3], Fisnik Kurshumliu[4], Kujtim Shala[1], Teuta Bicaj[1], Teuta Pustina[1], Linda Dula[1]
[1]Department of Prosthetic Dentistry, Dental School, University of Prishtina, Prishtina, Kosova, [2]Department of Prosthetic Rehabilitation, Periodontology and Implantology, Medical University of Graz, Graz, Austria, [3]Department of Surgery, Faculty of Agriculture and Veterinary, University of Prishtina, Prishtina, Kosova, [4]Department of Pathology, Faculty of Medicine, University of Prishtina, Prishtina, Kosova, [5]Department of Oral Surgery, Dental School, University of Prishtina, Prishtina, Kosova

Aim: Horizontal dimension of Mandible are subject of change due to toot extraction, injuries and several pathologies of crestal jaw bone. Reconstruction of horizontal defects can be managed by using several surgical procedures and implanting different materials. Aim of this preclinical study was to evaluate labio-lingual dimensional changes after horizontal bone augmentation of mandible using derivate bovine bone matrix (dbbm) with and without procine collagen membrane.
Methods: As an animal model have been used two mongrel dogs. After tooth extraction of 4th premolars and iatrogenic horizontal defect creation, with dimensions $2 \times 2 \times 1.5$ cm, on both sides, and healing phase of 3 months, horizontal bone augmentation with dbbm proceeded. Pouch technique was used to access the defect site. On the middle portion of the flap, width of 5 mm of periosteum was striped vertically. Using split mouth design, right side was covered with procine membrane and the left side left without. Impressions with Polyether impression material were taken in two different stages: 3 months after defect creation and 3 months after bone augmentation procedures. Values of labio-lingual dimensions based on same referent points on both stages were measured.
Results: There was dimensional improvement between stages (after bone augmentation) but with no statistical significance between right and the left side within the same stage and sample.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

FC237

Intra-Oral Halitosis Patients with Dental Implants

Anna Voronina
Dentistry Department of the Faculty of Internship and Postgraduate Education M. Gorky Donetsk National Medical University, Donetsk, Ukraine

Aim: Goal of research is to study morbidity of intra-oral halitosis of patients with dental implants.

Materials and methods: The Dental Clinic of Donetsk National Medical University carried out examination of 59 patients aged 55–65 with fixed dentures: 27 patients had implant-supported fixed dentures made of dental alloys (1 group), 22 patients – made of titanium BT1-00 (2 group).

Hygiene assessment of mouth cavity was conducted using the hygiene index OHI-S (1964). Halitosis was diagnosed by gas-liquid chromatography on volatile sulfur compounds concentration in expired air.

Results: Patients with implant-supported fixed dentures made of dental alloys have an oral hygiene deterioration - hygiene index range amounted to 1.45 ± 0.14. In the group of patients with implant-supported fixed dentures made of titanium hygiene index range amounted to 1.03 ± 0.11. A correlation relationship between oral hygiene rate and halitosis degree has been traced. Sulfur compounds were detected in the first group at 166.0 ± 24.2 ppb; in the second group – 142.0 ± 21.4 ppb.

Conclusions: Patients with implant-supported fixed dentures made of dental alloys have unsatisfactory mouth cavity hygiene and a high concentration of volatile sulfur compounds. Patients with implant-supported fixed dentures made of titanium have normal hygiene index and halitosis rate.

FC238

Difficult Cases and their Clinical Solution

Drwalid Khalid Odeh
Private practice

Introduction: In some clinical cases in our daily practice we might face bone deficiency to replace missing teeth with dental implants instead of doing second surgery and bone augmentation.we can be more conservative depending on orthodontic means such as extrusion of hopeless teeth in other cases we can use mini implants to adjust complicated orthodontic cases and surgical cases such as skeletal openbite or interocclusal space deficiency. This lecture for Implantologist, Orthodontist& General practitioner. In this lecture I will talk about clinical cases to show the interrelation between ortho &implant solving clinical cases with no surgery.

Cases: 1st will cover extrusion of hopeless anterior centrals to correct bone level before replacing them with dental implant instead of bone augmentation.

2nd to gain more interocclussal space by intrusion of opposite posterior teeth.

3rd case to correct skeletal openbite by using mini implant instead of orthognathic surgery.

4th case using mini implant to align tilted teeth to provide space for implant or bridge.

Free Communication Session 37 | B332 | 30.08.2013 | 11:30–12:30

Theme: Dental Treatment & Restorative Dentistry: Esthetics

FC239

Smile Analysis and Treatment Options for Gummy Smile Patients

Ahmed Korayem Abdelrahman
American Academy of Cosmetic Dentistry (AACD)

Introduction: Gummy smile is a very annoying cosmetic problem for many patients specially those who do not imagine that It is a solvable problem. accurat smile analysis is the key for a choosing the proper treatment option. in this presentation Smile Analysis will be explained for gummy smile by presentation of actual clinical cases before and after and during procedures.

Objectives: To evaluate the periodontal surgery and veneers combination technique in treating gummy smile.

Materials and methods: Smile analysis for two different gummy smile patients was applied based on smile design conecpts in the literature then they were planned to be treated using periodontal surgery crown lengthening and veneers combination, one case of a porcelain veneers (E-max, Ivoclarvivadent) and composite veneers (Artiste, Pentron) after periodontal surgery were applied documentation and evaluation for both cases based on pre and post operative x rays and pre and post operative photographs by SLR camera.

Results: After evaluation of the results it was found that periodontal surgery was successful to treat gummy smile giving the most esthetic results followed by porcelain (E-max) veneers

Conclusion: The combination of perisodontal surgery crown lengthening and veneers (porcelain or composite) has proven a good success to treat gummy smile cases.

FC240

Smile Design: Old Problem New Solutions

Mostaque H. Sattar, Mohammad Nasirul Islam
Depatment of Dentistry, Dhaka Dental College, University of Dhaka, Dhaka, Bangladesh

Introduction: Smile Designing Cosmetic dentistry is a modern art and science behind smiles. Dark and Discolored teeth, can be treated with teeth whitening by chemically activated or light activated whitening gel or even with laser, unhappy smiles, Caries, gap and fractured teeth can be managed with Direct or indirect composites and veneers, Gummy smiles can be corrected by laser. Co2 and other laser lonely can change the color of Unpleasant gum within few days, Implant and resin reinforced indirect composite can be a better options then bridge works for a missing tooth. Orthodontic can cure crowded, protrusive unhappy face. Crown can be delayed or even unnecessary if we can filled the cavity with fiber optic screw post reinforced composite after root canal treatment even in molar tooth. Some clinical cases will be presented to establish the above mentioned procedures. The patient loves new smile and teeth and feels they fit his/her personality and idea of perfection. After above mentioned procedure, we are able to correct all of the patient's concerns and achieve a great cosmetic result depending

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

on the socioeconomic conditions of South East Asia. The procedure was smooth and predictable by following the proper protocol.

Conclusion: In this modern era of Dentistry, we now have the responsibility to not only diagnose and treat, but to offer solutions for cosmetic problem in a minimal invasive way. As a profession we must remember, we treat not only teeth, but also the confidence of a person to which they belong.

FC241

Wireless Orthodontics and Flapless Dental Implants

Ahmed A. Moneim[1], Dircilene C. Souza[2]
[1]*AEGD Program, University of California at San Francisco, California, USA,* [2]*Los Gatos Dental Center, Los Gatos, California, USA*

Introduction: Wireless orthodontics used to prepare implant receptor sites, and flapless dental implants used as a minimally invasive implant surgery, are presented together as a versatile way to reduce treatment length while enhancing clinical outcome. The first clinical approach consists of a series of clear plastic removable appliances digitally fabricated that move the patient's teeth in small increments from their original state to a final treated state. The implant space preparation with wireless orthodontics may be attractive to implant patients who would not like to have metallic braces and wires in their mouth. However, creating sufficient interradicular space for implant placement in areas where convergent roots are present and bodily movements of teeth are needed can be challenging. Clinical tips on how to overcome those problems and use wireless orthodontics successfully will be addressed. The second clinical approach is a surgical technique for implant placement that purposely avoids elevation, advancement and closure of a flap over the implant. The rationale for the flapless approach is mainly to preserve circulation to the site while minimizing the surgical procedure. Flapless dental implant also allows for good quality soft tissue to remain surrounding the emerging implant structure for optimal function and aesthetics. The step-by-step on how to use the flapless technique will be addressed.

Conclusions: In summary, combining those two techniques can be a predictable treatment for patients who seek high aesthetics during treatment planning and placement of dental implants.

Theme: General Dentistry and Oral Health

FC242

Yoga for Dental Laboratory Technicians

Meenakshi Verma[1], Vaishali Vadgaonkar[2], Aniket Gandhi[2], Rahul Rao[1], Rajiv Verma[7], Deepak Langade[5], Rahul Hegde[3], Varsha Rathod[6], Rajesh Kopikkar[4], Parag Gangurde[2], Manthan Patel[2], Nikhil Mahajan[2]
[1]*Department of Conservative Dentistry and Endodontics, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India,* [2]*Department of Orthodontics and Dentofacial Orthopaedics, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India,* [3]*Department of Pedodontics and Preventive Dentistry, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India,* [4]*Department of Periodontology, Bharati Vidyapeeth Deemed University Dental College and Hospital, Sangli, India,* [5]*Department of Pharmacology, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India,* [6]*Department of Periodontology, Bharati Vidyapeeth Deemed University Dental College and Hospital, Navi Mumbai, India,* [7]*Private Practice and Dental Lab Technician, Mumbai, India*

Advancement of technology in the scientific field of dentistry has been tremendous and the dental laboratory too has witnessed it. However technology comes with its own set of problems. Dental technicians all over the world are facing health issues, hence a study was undertaken.

Aim: To determine the problems faced by the dental laboratory technicians and lay down a specific yoga sadhana (yogic practices) for them.

Method and materials: Interviews were conducted of 25 dental laboratory technicians on a one to one basis. The information was recorded in a systematic manner as per an extensive form that contained personal or general information, medical ailments, postural ailments, stress and general fitness.

Conclusion: An insight into the problems of dental laboratory technicians was gained, and basic statistical analysis was performed. Problems faced by technicians were due to many reasons including wrong working postures, exposure to an environment full of suspended air pollutants like, aluminum oxide powder particles, acrylic, ceramic and metallic dust, wax and chemical fumes, long working hours, erratic timings and environment, stress due to work pressures and maintaining delivery schedules, etc.

An analysis into the problems and the convincing evidence of the healing potential of Yogic Practices made it evident that Yoga could solve many of the issues especially stress which can be tackled in a very holistic manner. Keeping this in mind specific yoga sadhana (yogic practices) was proposed.

Theme: Dental Treatment & Restorative Dentistry: Materials

FC243

Cytotoxicity of Hemostatic Agents on the Human Gingival Fibroblast

Muhammet Yalçın[1], Çağatay Barutcigil[2], İbrahim Umar[1], Buket Bozkurt[3], Sema S. Hakkı[4]
[1]*Department of Restorative Dentistry, Faculty of Dentistry, İnönü University, Malatya, Turkey,* [2]*Department of Restorative Dentistry, Faculty of Dentistry, Akdeniz University, Antalya, Turkey,* [3]*Research Center, Faculty of Dentistry, Selcuk University, Konya, Turkey,* [4]*Department of Periodontology, Faculty of Dentistry, Selcuk University, Konya, Turkey*

Aim: The aim of this study was to evaluate cytotoxic effect of hemostatic agents on human gingival fibroblast cells by using real-time cell analysis method.

Materials and methods: Two hemostatic solutions, Hemoban (Sultan Healthcare, Hackensack, NJ, USA) and Hemasatic Solutions (W.P Dental, Hamburg, Germany) that includes mainly aluminum chloride were used with different concentration. Gingival fibroblasts

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

were isolated from gingival connective tissue during crown lengthening surgery of systemically healthy subjects. Gingival fibroblasts were maintained with Dulbecco's modified eagle medium containing 10% fetal bovine serum. A real-time cell analyzer (RT-CES, xCELLigence; Roche Applied Science, Mannheim, Germany, and ACEA Biosciences, San Diego, Calif) was used to evaluate cell survival. After seeding 200 ml of the cell suspensions into the wells (10,000 cells/well) of the E-plate 96, gingival fibroblasts were treated with hemostatic solutions (1/2, 1/4 and 1/8 dilutions) and monitored every 15 min for 72 h. For the proliferation experiments, the statistical analyses used were 1-way analysis of variance (ANOVA) and Tukey HSD multiple comparisons tests.
Results: According to statistically analysis, when evaluated at 48 and 72 h, there were significant differences between the cell indexes of the control and all hemostatic agents groups ($p < 0.001$). Agent reduced cell index value significantly when compared to untreated control group.
Conclusion: The results indicate that using of Hemoban or Hemostatic Solutions as astringent solutions have a significant cytotoxic effect on gingival fibroblast cells.

Free Communication Session 38 | B342 | 30.08.2013 | 11:30–12:30

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

FC244
Two-Body Wear of Five Provisional Crown Materials
Hanefi Kurt[1], Kurt Jürgen Erdelt[2], Altuğ Çilingir[3], Hakan Bilhan[3], Tonguç Sülün[3], Necat Tuncer[3], Wolfgang Gernet[2], Florian Beuer[2]
[1]Department of Prosthodontics, School of Dentistry, Istanbul Medipol University, Istanbul, Turkey, [2]Ludwig-Maximilians-Universität München, Poliklinik für Zahnärztliche Prothetik, Munich, Germany, [3]Department of Prosthodontics, Faculty of Dentistry, İstanbul University, Istanbul, Turkey

Purpose: This study investigated the resistance to wear of five different types of provisional crown material using a two-body wear simulation under wet conditions.
Materials and methods: Nine specimens of each provisional crown material (Dentalon Plus, Luxatemp, Protemp 3, and Protemp 4), with dimensions of 16 mm diameter and 3 mm thickness, were tested under wet conditions. The wear test was performed in a Chewing Simulator CS-4 ($n = 9$; test load: 50 N; number of cycles: 10,000, 20,000, 30,000; water for wet conditions) with steel balls used as antagonists. Wear was determined by 3D laser scanning and a surface analysis program. To detect statistically significant differences between groups, wear data after 10,000, 20,000, and 30,000 cycles were compared by analysis of variance (ANOVA), with the Student-Newman-Keuls post hoc test. The level of significance was set at 5%.
Results: One-way ANOVA detected significant differences between the provisional crown materials tested ($p < 0.05$). In addition, for all materials tested, except Dentalon Plus, significant differences in wear with increasing numbers of cycles were observed ($p < 0.05$).
Conclusion: Susceptibility to wear differs significantly between different provisional crown materials.

FC245
Vestibular Deepening with the Aid of the Diode Laser: Clinical Experiences
Nermin Demirkol[1], Fatih Sarı[1], Mehmet Demirkol[2]
[1]Department of Prosthodontic, Gaziantep University, Gaziantep, Turkey, [2]Department of Oral and Maxiilofacial Surgery, Gaziantep University, Gaziantep, Turkey

Background: Vestibuloplasty is a surgical procedure for deepening of vestibular sulcus by changing the soft tissue. A various of factors such as age, physical conditions, the height of basal and alveolar bone, undesirable contours, nearness to anatomic structure (arteias, nervs), thickness of mucosa and muscles must be evaluated.Various deepening techniques have been employed.there are three techniques for vestibuluplasty:submucosal vestibuloplasty, seconder epitelization vestibuloplasty, vestibuloplasty with graft.Vestibuloplasty is a method for decreasing patient pleasure when complete dentures lose their stabilization.
Method and materials: Four patients with complain of lack of retantion for their complete dentures applied to Prosthodontic Department, Gaziantep University Faculty of Dentistry.Patients evaluated and open submucosal vestibuloplasty procedure was planned. The procedure were explained to the patients clearly and constents were obtained.The diode laser was used to deepening submucosal areas without local anaesthesia.This laser beam was set at 3 W continous mode with 300 mm diameter fiber-optic filament. Fiber-optic filament applied perpendiculary to the vestibular sulcus. Finally mucosa cleaned with saline and gauze pack.Immediately after the treatment prosthesis were supported with visco-gel and 1 week after conventional procedure for complete denture was applied.
Results: A deepth vestibular sulcus for maxilla or mandibula was achieved in all patients by this kind of diode laser.
Conclusion: Vestibular deepening is sometimes necessity for complete dentures and may be achieved by using different therapeutic approaches. To resolve this condition, the use of an 810 nm Diode laser has been suggested as an alternative to conventional procedures because of providing sterile conditions, less operating time, fast healing proces and less bleeding.

FC246
Visual and Instrumental Agreement in Dental Shade Selection
Buket Evren, Burçin Vanlıoğlu, Erhan Tuğcu, Mevlüt Yazıcı, Yasemin Kulak Özkan
Department of Prosthodontics, Marmara University, Istanbul, Turkey

Aim: The aim of this study was to test the the hypothesis that the agreement between observer visual dental shade matches and instrumental shade identification is higher using the Vita 3DMaster shade guide than the Vita classical shade guide
Methods: Two research assistants (D1–D2) and two assistant proffessors in the Department of Prosthodontics (P1–P2) performed dental shade selection in the maxillary central incisors of 30 subjects. All observers used both shade guides. The shade tabs and natural teeth were identified using an intra-oral spectrophotometer (Vita Easyshade) to determine the instrumental agreement with the

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

visual shade selection. The percent visual–instrumental shade agreement (PVIA) was analyzed statistically considering observer population and shade guide set.
Results: The spectrophotometer evaluation of the Vita3DMaster shade guide revealed more acccurate results than the Vita Classical shade guide. An intra-examiner agreement was observed. Results indicated that D1and D2 demonstrated the highest PVIA for Vita Classical, P1 and P2 demonstrated the highest PVIA for both shade guides. PVIA was higher for P1 and P2. A significantly higher visual–instrumental shade agreement was demonstrated by the clinically experienced dentists, regardless of shade guides.

FC247
Microleakage of Inlay Ceramic Systems Luted with Resin Cements
Bülent Cumhur Uludağ, Elif Saran
Departmant of Prosthodontics, Ankara University, Ankara, Turkey

Purpose: The aim of this study was to evaluate the microleakage of CEREC 3, IPS e.max Press, and Turkom-Cera inlays cemented with three self-adhesive resin cements.
Method and materials: Ninety standardized Class III MOD cavities were prepared in intact human mandibular third molars. Ceramic inlays were fabricated according to the manufacturer's directions and were cemented using three self-adhesive resin cements (RelyX Unicem, Smartcem2, and Speedcem). The specimens were stored in distilled water at 37°C for 24 h and subjected to thermocycling in water for 1000 times between 5 and 55°C with a dwell time of 30 s. Subsequently, the specimens were subjected to 100,000 cycles of mechanical loading of 50 N at 1.6 Hz in 37°C water. The specimens were immersed in 0.5% basic fuchsine for 24 h and were sectioned using low-speed diamond blade. The percentage of dye leakage at the tooth/restoration interface were measured and compared by Kruskal-Wallis tests with Bonferonni correction and Mann-Whitney U tests at a confidence level set at $p < 0.05$.
Results: Microleakage at the RelyXUnicem interface was lower than Smartcem2 and Speedcem resin cements ($p < 0.05$). Microleakage of Turkom-Cera system was higher than CEREC 3 and IPS e.max Press ceramic inlays ($p < 0.05$).
Conclusions: Within the limitations of this study, RelyX Unicem showed lower microleakage values in both enamel and dentin margins. Turkom-Cera ceramic inlays showed higher microleakage values in both enamel and dentin margins.

FC248
Needs and Demands for Prosthetic Treatment of Missing Teeth among Jordanian Population
Gadeer E. Mukatash
Nimri Consultant in prosthodontics, Amman, Jordan

Objectives: To evaluate level of knowledge, awareness and attitude about teeth-replacement options among a group of medical and paramedical subjects and to compare them with the general population.
Methods: Self administered questionnaires were distributed to two groups of subjects. Questions focused on the willingness to replace the missing teeth, the preferable methods of choice for replacement and the reasons for these choices. The first group (G-I-) was from the medical and paramedical staff work in a military hospital at Jordan Royal medical services, the dental staff was excluded from the study. The other group (G-II-) was from general population attended the dental department in the same hospital with comparable level of education. A total of 612 questionnaires were distributed, of which 533 questionnaires were returned (response rate 87.09%).
Results: G-I- have more awareness than G-II- to the probable causes for tooth/ teeth replacement and limitation of the preferable method for replacement ($p < 0.05$). More than 80% of the participants believe that replacement of anterior teeth is more important than posterior teeth. Implants and fixed partial denture respectively was more preferable than removable prosthesis although clinically was not indicated in cases ($p < 0.05$). There was no clinical benefit from replacement of missing teeth in 33.4% while only 6% believe of this.
Conclusions: The prosthetic needs between medical and paramedical staff to is better than between general populations. The demands for dental replacement by patients were significantly different when compared with the actual needs.

Free Communication Session 39 | B343 | 30.08.2013 | 11:30–12:30

Theme: General Dentistry and Oral Health

FC249
A retrospective Study of Oral Lichen Planus in Adult Population in Greece
Aikaterini Dimitriou, Flora Zervou Valvi
Dental Department of "Asklepieion Voulas" General Hospital, Athens, Greece

Aim: This retrospective study was undertaken to investigate epidemiological and clinical data of oral lichen planus (OLP) in patients presented at the Stomatological Clinic of the Dental Department of a General Hospital in Greece.
Materials and methods: Data were obtained from the evaluation of 600 randomly selected medical records. Forty-two (42) cases with undoubtful diagnosis of OLP set either by clinical or by clinical and histologic criteria after a biopsy (14 cases) were analyzed.
Results:
Analysis showed that: 1. The occurrence of OLP in this selected sample was 7% with a female predilection (males/females = 2/3) and a mean age of presentation at 57.8 years. 81.4% of them were above 50 years of age.

2. Erosive type alone or combined with white lesions (reticular, papular or plaque) was the commonest form (24 cases) while reticular type alone was the second most common (13 cases). Buccal mucosa was the site of predilection (20 cases). Local corticosteroids and systemic steroids were used for the treatment and a 4.9 mean number of visits/per patient were required.

3. One case with erosive type of OLP underwent malignant transformation (squamous cell carcinoma).

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Conclusions: 1. OLP is a relatively common mucosal disease among adult patients presented at our Clinic.

2. OLP had a female and older age predilection. Lesions had periods of exacerbation and quiescence.

3. Erosive type that causes pain and discomfort was the commonest in our sample. This type needs more frequent follow up examinations as this may develop malignant transformation.

FC250

Clinical Assessment and Characteristics of a Group of Turkish Patients with Oral Mucosal Diseases

Asuman Akgün[1], Şebnem Yalçınkaya[2], Şükran Atamer Şimşek[1]
[1]*Department of Pharmacology, Basic Medical Sciences, Faculty of Dentistry, Marmara University, Istanbul, Turkey,* [2]*Department of Dentomaxillofacial Radiology, Faculty of Dentistry, Marmara University, Istanbul, Turkey*

Objective: The purpose of this study was to assess the clinical and behavioral characteristics of a group of patients with oral mucosal diseases(PwOMD).

Study design: Sixty-four patients (43 female and 21 male, between 11 and 80 years of age) referring to an Oral Medicine Clinic were analyzed regarding their behavioral characteristics and clinical diagnoses during a 3-month period just after the initial diagnosis of OMDs. Data were collected by conducting face-to-face interviews guided by predetermined twenty-six-item-questionnaire which were analyzed statistically.

Results: The most common OMDs were recorded as benign hyperplasias(17.2%), apht/ulcer(15.6%) and lichen planus(15.6%). Females were more affected than males ($p = 0.037$). 90.6% PwOMD were aware of their OMDs. Smoking (34.4%) was the most common habit in the studied population with OMDs. The duration of smoking was 10.76 ± 14.80 years in males and 5.40 ± 10.11 years in females. 18.8% of the patients were drinking alcohol. Females were more frequently denture wearers than males ($p = 0.01$). 53.1% of PwOMD had systemic diseases and of this group 28.1% had more than one systemic disease and only 54.7% of this group stated that they were having their medication regularly. Hypertension was the most frequent systemic disease (15.6%), followed by gastrointestinal diseases (14.1%).

Conclusion: Based on the findings of this studied population, oral mucosal diseases seem to be ignored by the patients. Analysis of the data underlined the fact that there has been a lack of interest towards OMDs, behavioral risk factors for oral precancerous lesions and their general health.

FC251

Lupus Patient – The Dentist has a Very Important Role to Play

Shegufta Mohammad
Update Dental College, Dhaka, Bangladesh

Aim: Systemic Lupus Erythematosus is a chronic inflammatory multisystem disease of unknown etiology. It is an autoimmune disease where body's immune system mistakenly attacks its own tissues, causing multi-organ inflammation and diverse clinical manifestations with domination of peripheral symmetric polyarthritis of small and large joints. Approximately 95% of lupus patients suffer from some form of oral involvement. Lupus patients suffer from the following mouth symptoms: dry mouth, cracked lips, bleeding gums, sore jaws, gingivitis (gum disease), cracked tongue, oral lesions, lichen planus, ulcers (tongue, mouth, gums and cheeks), and candidias thrush infections (yeast infections). Those patients also suffering from TMJ or oral scleroderma can have tightening of the mouth and jaw which can result in more abscesses and cavities. Patients with Sjogren's Syndrome usually have severe dry mouth which results in massive decay, dental infections, thrush (yeast infections), and gum disease. Lupus is considered as high-risk category of disease by The American National Guideline Clearinghouse and American Academy of Dermatology so they recommend that patients with this kind of condition require antibiotic premedication before dental treatment.

Conclusions: So the responsibility of a dental surgeon in unquestionable for the benefit of the lupus patients.

FC252

The Effect of Supersaturated Calcium-Phosphate Oral Rinse on Oral Yeasts Infection

Marinka Mravak Stipetic[1], Ivana Jurcic Culina[2], Johnatan Belsey[3]
[1]*Marinka Mravak-Stipetic, Professor, School of Dental medicine, University of Zagreb, Zagreb, Croatia,* [2]*Ivana Jurcic Culina, DMD, Resident, University Dental Clinic, University Clinical Hospital Zagreb, Zagreb, Croatia,* [3]*Johnatan Belsey, MD, JB Medical Ltd, The Old Brickworks, Chapel Lane, Little Cornard, Sudbury, UK*

Aim: The aim was to investigate the effect of supersaturated calcium - phosphate oral rinse (Caphosol®) on oral yeasts in 120 patients with dry mouth.

Method and materials: In all patients (aged 67–89) unstimulated (QnS) and stimulated whole saliva (QsS) was measured. Swabs were taken from oral mucosa for yeast culture. Patients with positive yeast culture were randomly assigned into four treatment groups (study group-A and control groups- B, C, D): Group A was treated with Caphosol®, Group B with a combination of Caphosol® and miconazole oral gel, Group C with a solution of sodium bicarbonate, and Group D with only miconazole oral gel. Treatment was carried out for 2 weeks. Control yeast culture and salivary volume (QnS and QsS) were determined in each subject at baseline (0 day), after 7 and 14 days. Between-group analysis was carried by using ANOVA, followed by Tukey HSD testing for pairwise comparisons.

Results: All patients had positive yeast culture and 87.50% had hyposalivation. The increase in salivary volume was greatest in group A and significantly different compared to group C ($p < 0.01$) for period 0–14 days. Significant decrease in fungal infection was detected in groups A, B and D compared to group C for time period between 0–7 days and the 0–14 days. Between groups A, B and D no statistically significant differences were found.

Conclusion: Supersaturated calcium-phosphate oral rinse (Caphosol®) increases the amount of saliva and significantly reduces oral

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

fungal infection. In comparison with miconazole alone or in combination no significant differences were found.

FC253

Oral Health and Oral Hygiene Practices among Institutionalized Orphans, Yemen

Sadeq Ali Al Maweri, Walid Al Soneidar, Esam Halboub
Departemnt of Oral Medicine, Sanaa University, Sanaa, Yemen

Aim: The aim of this study was to assess the prevalence of oral mucosal lesions, dental caries and oral hygiene practices among institutionalized orphan children in one of the orphanages in Sana'a, Yemen.
Methods: This cross-sectional study involved 202 institutionalized orphan children aged 6–15 years. Clinical examination included assessment of dental status using DMF/dmf index, and assessment of oral mucosal lesions using standard international diagnostic criteria and WHO codes. Demographic data and oral hygiene practices were obtained through interviewing each child using special questionnaire form.
Results: The results showed that (41.1%) of the study subjects had one or more oral soft tissue lesions. Nine types of oral mucosal lesions were reported; the most common lesions were: fissured tongue (24.3%), Herpes labials (7.9%), Fistulas (4%), geographic tongue (2.5%), and traumatic ulcers (2.5%). The results showed that 15.3% of the study subjects were caries free. Overall, dmfs, dmft, DMFS, DMFT were 4.23, 2.28, 2.73, and 2.06 respectively. The highest dmfs / dmft were found among the 9–11 years age group, while the highest DMFS/DMFT were scored by the 12–15 years age group. Unfortunately, high proportion of the subjects (44.1%) reported that they never clean their teeth, while (27.7%) reported to clean regularly and (28.2%) irregularly.
Conclusion: The findings of this study demonstrate that the institutionalized children in this orphanage have a high prevalence of oral lesions, a low prevalence of dental caries, and poor oral hygiene practices.

Free Communication Session 40 | B360 | 30.08.2013 | 11:30–12:30

Theme: Implantology: Oral Surgery

FC254

Platelet Rich Fibrin Membrane over Immediate Implants

Walaa Kadry Hafez, Hazem Shawky, Sameh Seif, Maha Mohamed Hakam
Department of Oral and Maxillofacial Surgery, Faculty of Oral and Dental Medicine, Cairo University, Cairo, Egypt

Aim of the study: To evaluate platelet rich fibrin (PRF) as a membrane for coverage of immediate implants in the maxillary anterior region.
Patients and methods: Twelve implants were inserted in eight adult patients indicated for extraction &immediate implant insertion in one or more of the upper anterior teeth. A venous blood sample of 10 cc. was obtained for each single implant. After implant placement, the peri-implant defect was filled with autogenous bone (collected from the chin)-PRF mix then a PRF membrane was used to cover the implant site. The implant site was followed up clinically & radiographically immediately, 3, and 6 months post-operatively to evaluate soft tissue healing & crestal bone stability.
Results: PRF provided good soft tissue coverage over the immediate implants. Within the 6 months follow up period, the marginal bone was stable in 83% of cases. The technique was easy to perform with good esthetic results.
Conclusion: PRF could serve as a resorbable membrane for guided tissue regeneration.

FC255

Rare Case of Multifocal Papilloma Virus Epithelial Hyperplasia

Elitsa Georgieva Deliverska[1], Latchezar Stefanov Petkov[1], Maria Stoyanova Dencheva[2], Angelina Kisselova[2]
[1]Department of oral and maxillofacial surgery, Faculty of dental medicine, Medical university, Sofia, [2]Department of imaging and oral diagnostics, Faculty of dental medicine, Medical university Sofia

Introduction: Multifocal papilloma virus epithelial hyperplasia (MPVEH) is a rare disease of the oral mucosa associated with the human papilloma viruses (HPV) 13 and 32. It occurs at any age, but children have the highest incidence.
Purpose: To present a case of oral multifocal papilloma virus epithelial hyperplasia with palatal tumour and multiple metachronic primary cancers.
Method and materials: The medical history shows a 60 years female patient with complaints of asymptomatic mass on the palatal mucosa, with a 2 years' development. The patient has been treated surgically for previous thyroid cancer, endometrial cancer and cancer of the mammary gland. An incisional biopsy has been performed in her left buccal mucosa 10 years ago and histopathological examination confirmed the diagnosis of MPVEN.

The palatal tumour was removed surgically by electroexcision and the histological result was pleomorphic adenoma of a small palatal salivary gland.
Conclusion: Papillomatosis is considered as a benign neoplasm with an unpredictable course and with a low probability of malignancy.We report of an unusual case of MPVEH persistent for more than 30 years without regression and with significant impact on a patient's quality of life.

FC256

Removal of Fibromatosis Lesions Using Diode Laser (810 nm) Two Cases Report

Bilge Yüksel Köroğlu[1], Işıl Keçik Büyükhatipoğlu[1], Fatih Sarı[1], Aslihan Usumez[2]
[1]Department of Prosthodontics, Faculty of Dentistry, Gaziantep University, Gaziantep, Turkey, [2]Department of Prosthodontics, Faculty of Dentistry, Bezmialem Vakif University, Gaziantep, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: Removal of fibroma in the oral mucosa with the use of diode laser has become a common procedure for dentists and maxillofacial surgeons for preprosthetic surgery. The effectiveness of diode laser has been proven to work as well as the treatment of intraoral pigmentation, vascular lesions of soft tissues, lingual and labial frenectomy, upper and lower epulis and gingival hyperplasia. The removal of asymptomatic fibromatosis lesions at two cases will be described and evaluated the healing of these sites after irradiation with the use of diode laser (810 nm).
Cases: In these two clinical cases, fibromatosis lesions were treated by 810 nm diode laser (Fotona, Ljubljana, Slovenia) in contact with 300 μm fiber, in continuous wave mode and were followed up their healing process during 1, 3 and 10 days. The use of diode laser reduced the operating time without using sutures and intraoperative bleeding, restricted the swelling and fastened healing without scarring. The patients had less post operative pain on the surgical sites when compared with conventional treatment.
Conclusions: The diode lasers (810 nm) are beneficial in fibroma removal treatments by reducing the bleeding and surgical time. It restricts the swelling and fastens the healing process.

FC257
Sinus Floor Augmentation using Polyethylen Glycol Hydrogel or Collagen Membrane
Laurent Ohayon
Private Practice, Saint Maur des Fossés, France

Background: Maxillary sinus floor augmentation is used to increase under sinus crestal bone height in case of important sinus pneumatization in order to allow implant insertion. The lateral Caldwell-Luc technique is used when the residual under sinus bone height is less than 5 mm. Collagen barrier membranes are most commonly used to protect the bone substitute inside the sinus bone window from connective tissue ingrowth. A new polyethylen glycol hydrogel (PEG) membrane is proposed to allow guided bone regeneration (GBR).
Aim: The aim of this presentation is to compare PEG and collagen membranes utilization protocol in case of lateral sinus floor augmentation and to analyse the histological, histomorphometric and tomodensitometric behavior of the sinus graft using the same bone substitute.
Method and materials: Presentation of several lateral bone window sinus floor augmentation clinical cases using PEG hydrogel and collagen membranes.

Description of the different protocols used for theses two membranes.

Analysis of the histological, histomorphometric and tomodensitometric results using Biphasic Calcium Phosphate (BCP) graft covered by these two membranes.
Results: Six months after sinus floor augmentation surgery, histomorphometric evaluation showed 28.4% of newly formed bone and 21, 7% of remaining bone substitute using the PEG hydrogel membrane. These results correspond to the published average rate when collagen membranes were used.
Conclusion: PEG is a new barrier membrane presenting GBR properties, with specific handling due to its gel-like consistency.

FC258
The Imperatives of 3-Dimensional Implant Position in Defected Esthetic Zones
Kadhim Abul Ameer Al Himdani
French Center for Dental Implant, Sharjah, United Arab Emirates

Objectives: The objective of this study is to show our clinical experience where we obtained very satisfying esthetic results for different critical situations of bone deficiency in esthetic zones without going through sophisticated procedures of ridge management like bone augmentation, ridge splitting, and distraction osteogenesis.
Method and materials: Our clinical study comprised 98 implants placed on 60 patients in sites with bone deficiency in the anterior maxilla and mandible. Selection of proper implant macro-geometric design and size, appropriate surgical approach and procedure, manual atraumatic bone appreciation osteotomy preparation, proper implant orientation and subcrestal position, adapted prosthetic restoration specially with integrated abutment crowns are factors we considered to avoid pre-operative ridge management and bone augmentation procedures, with 3 years follow-up. Cases with sites without bone deficiency were excluded. Xenografts were used simultaneously in a few cases to give hard and soft tissue support, yet implants osseointergration was independent from the grafting material.
Results: When following our proposed criteria of implant therapy in sites with bone deficiency, survival rate of 95.9% and a success rate of 100% were reported.
Conclusion: Satisfying esthetic results in sites with bone deficiency can be obtained without pre-operative ridge management procedures. We highlight the significance of implant design, orientation and subcrestal position, surgical approach and procedure, and finally adequate prosthetic restoration and fixation; all these elements clinically proved their efficiency to overcome going through long, complicated, risky, and painful procedures. Thus achieving Minimal Invasive Implantology and shifting the conventional "Restoration-Driven Implant Placement" concept towards "Bone-Driven Implant Placement".

Free Communication Session 41 | B342 | 30.08.2013 | 14:00–15:00

Theme: General Dentistry and Oral Health

FC259
Community–Oriented Primary Oral Health Care in Nigeria: The Abeokuta Initiative
Sherifat Omolola Quadri[1], Kafayat Abdulazeez[2]
[1]*Preventive Dentistry Department, Access Oral Health Care Services Inc., Abeokuta, Nigeria,* [2]*Research and Development Department, Access Oral Health Care Services Inc., Abeokuta, Nigeria*

Aim: The aim of this research and programme was to promote sustainable development, by fostering equitable distribution of accessible basic oral health care at affordable costs and community encouragement of self-care and to develop a replicable and

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

sustainable model of community-level grassroots intervention, and to actively engage development workers, policy makers and other stakeholders in a broad scale replication of the innovative dental models.

Materials and methods: At baseline, 150 resident were systematically sampled and asked to complete a 60 min interview (participant rate 52%, mean age 62+78.2% female, 83.1% male, 54.3% with incomes). Subjects were offered a free oral examination, education and prevention services, transportation to dental appointments, and comprehensive dental care on a sliding fee basic. Our initiative adopted participatory styles of development, to implement its oral health programmes, building the capacity of local communities to access their own oral health priorities, identify solutions to them, implement these solutions and monitor the impact on pre-defined health and development outcomes.

Result: After 18 months, 101 participants or 52.3% of the original sample were re-interviewed (11.0% moved, 8.9% died, 6.8% refused, 3.4% were too ill to participate.) Dental services use increased with 68.3% of respondents reporting a dental visit in the past one and the half years as compared to only 24.6% at baseline.

Conclusion: The programme had a significant impact on peoples' oral health, it gave an increased use of their available preventive and curative services with improvements in perceived oral health and better dental related knowledge and attitudes.

FC260

Continuous Development of an Oral Health Score for Clinical Audit

Michael Clive Busby[1], Roger Matthews[1], Elizabeth Chapple[2], Trevor Burke[3]

[1]Denplan Ltd, [2]OHI Ltd, [3]University of Birmingham

Aim: To report on the continued development of an oral health status score designed to support general dental practitioners in monitoring oral health outcomes with their patients.

Methods: An oral health score module (OHS) was developed as part of a comprehensive on-line patient assessment tool. The other two modules in the assessment measured future disease risk and indicative capitation fee grading. The OHS was developed over 20 years of research and experience from the Oral Health Index (Burke and Wilson 1995). The online tool was piloted by 25 volunteer dentists who provided qualitative and quantitative feedback. Anonymised data from the inputs and scores generated were collected centrally and analysed for 680 recall patients.

Results: The validity of the OHS was perceived to be sound by this pilot group. The assessment data submitted confirmed an average age for the patients examined as 53 years and their average OHS to be 79.5 where a score of 100 equates to perfect oral health. A breakdown of the scores into the eight components of the OHS provided evidence of cross validation with the Adult Dental Health Survey (2009).

Conclusion: There is evidence that scoring oral health status in this manner is valid. It therefore presents valuable opportunities to audit patient outcomes progressively, either for individuals, or for groups of patients. Audit is facilitated considerably by this move from, essentially a paper based system, to an on-line tool with central data collection.

Theme: Preventive Dentistry: Epidemiology

FC261

Trends in Caries Status of Schoolchildren in Malaysia

Noor Aliyah Ismail, Khairiyah Abdul Muttalib, Natifah Che Salleh

Oral Health Division, Ministry of Health, Malaysia

Aim: The National Oral Health Survey of Schoolchildren in Malaysia was conducted in 2007 (NOHSS 2007) a decade after the first national baseline survey in 1997 (NOHSS 1997) to assess trends in caries status among 6-, 12- and 16-year-old schoolchildren, as part of the objectives of the survey.

Materials and methods: A cross-sectional survey involving a two-stage systematic probability sampling proportionate to population by location in each state, with schools under the Ministry of Education forming the sampling frame. A total of 6,937 6-year-old children, 11,292 12-year-old children and 8,478 16-year-old children were examined. The weighted sample of children examined represented more than 98% of the estimated enrolment of schoolchildren in these age groups in 2007. Findings were compared with NOHSS 1997. Ethical approval was obtained from the Medical Research Ethics Committee, Ministry of Health Malaysia.

Results: Comparing NOHSS 1997, caries prevalence decreased in all three age groups; 6-year-olds: 80.9–74.5%, 12-year-olds: 60.9–41.5% and 16-year-olds: 75.5–59.6%. The mean dft of 6-year-olds decreased from 4.1(1997) to 3.6 (2007) while the DMFT of 12-year-olds and 16-year-olds decreased from 1.9 to 1.1 and 3.3 to 2.1 respectively.

Conclusions: There has been a decline in caries prevalence and severity among all age groups, with a slower decline in 6-year-olds compared to 12- and 16-year-olds. Extensive coverage of schoolchildren under the School Incremental Dental Care Programme and the use of various fluoride modalities contribute to the decline. Towards sustaining these trends, Malaysia has a National Oral Health Plan 2011–2020.

Theme: General Dentistry and Oral Health

FC262

Betel Nut Chewing Associated With Severe Periodontitis – Case Report

Dhirendra Kumar Giri[1], Pratibha P. Kundapur[2]

[1]Department of Periodontics, B.P.Koirala Institute of Health Sciences, Dharan, Nepal, [2]Department of Periodontolgy, Manipal College of Dental Sciences, Manipal, India

Introduction: Betel quid chewing has been in practice among people in many Asian countries since ages. It is the most widely used psychoactive substance and an important environmental risk factor for development of oral premalignant lesions and cancer. Arecoline, the major alkaloid of areca nut, has been known to cause cytotoxicity and genotoxicity in mammalian cells in vivo and in vitro and even contributes to carcinogenicity. It also increases the risk and severity of periodontal disease.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Case: This paper presents a case of betel nut chewing associated with severe periodontitis in a 32 year old male patient.

FC263

deo2u: An Innovation in Dental Education Online

Mahyunah Masud[1], Mohamed Ibrahim Abu Hassan[1], Shahida Mohd Said[2]
[1]*Universiti Teknologi Mara,* [2]*Universiti Kebangsaan Malaysia, Shah Alam Selangor, Malaysia*

Aim: Dental education has always been traditionally structured that students learn what teachers chose to teach them face to face. However, the increase in the number of dental institutions created constraints for the traditional mode of teaching. Students also have packed schedule resulting in a stressful learning environment. Available online applications have great potential to complement this mode of teaching but they are found to be not ccomprehensive, lacking in outcome-based-assessment and feedback. Thus, application has not been successful in getting lecturers and students to interact and the institution failed to benefit from the technology. The aim of this study was to develop a dental education online package and to assess the application
Materials and methods: www.deo2u.edu.my as a supplement to complement the current teaching. A learning management system i-learn available in the university was modified, developed and hosted at www.deo2u.edu.my.
Results: One hundred and Eighty year 1–5 dental students logged on to the website and later on assessed the website through self-administered questionnaires using Website Motivational Analysis Checklist Professional. www.deo2u.edu.my was analyzed according to its four general characteristics: engaging, meaningful, organized and enjoyable. Between 90–97% students felt that the application was meaningful, organized and easy to use with 83–88% were convinced it was attractive, interesting and fun to explore. Pleasing background was reported by 78% of the students.
Conclusions: www.deo2u.edu.my is an innovation in dental education online that can provide comprehensive teaching modalities made available whenever and wherever to overcome the constraints of time and limited academic resources.

Free Communication Session 42 | B343 | 30.08.2013 | 14:00–15:00

Theme: General Dentistry and Oral Health

FC264

Mandibular and Lumbar Bone Mineral Density with QCT in Egyptian Females

Dina Mohamed El Beshlawy[1], Moshera Mohamed Dahaba[2], Hala Ahmad Raafat[3], Mohamed Abd El Fattah[4]
[1]*Dina El Beshlawy, lecturer, Oral Radiology department, Cairo university, Egypt,* [2]*Moshera Dahaba, Professor, Oral Radiology department, Cairo university, Egypt,* [3]*Hala Raafat, Associate professor, Rheumatology department, Cairo university, Egypt,* [4]*Mohamed Abd El Fattah, Associate professor, Radiodiagnosis department, Cairo university, Egypt*

Osteoporosis is a skeletal disease characterized by low bone mass that was previously thought to affect the jaw bones. Aim of the study: This study was aiming to evaluate the relationship between mandibular and lumbar vertebral bone mineral densities in osteoporotic patients using quantitative computerized tomography.
Methods: In the current study, twenty females aged between 40 and 70 years were selected and screened by DXA scan of spine, femur and forearm. According to the resultant T-scores, they were categorized into normal group (five patients), osteopenic group (seven patients) and osteoporotic group (eight patients).The patients were further subjected to QCT examinations of both spine and mandible.
Results: On comparing the three groups concerning the mandibular BMD measurements by QCT, no statistically significant difference was found between the normal, osteopenic and osteoporotic groups regarding the buccal cortex, the lingual cortex or the trabecular bone.
Conclusion: Systemic osteoporosis is not necessarily associated with mandibular osteoporosis; consequently the disease is not an absolute contraindication for dental implants placement.

Theme: Implantology: Oral Surgery

FC265

The Phenomenon of Ectopic Eruption of the Teeth Clinical Point of View

Khaled Mohamed Mansour
Alexandria Dental Research Center, Alexandria Dental Directorate, Ministry of Health, Alexandria, Egypt

Aim: An ectopic tooth can be found in sites outside of the oral cavity, and can be a supernumerary, deciduous or permanent tooth. The maxillary sinus and palate are the most frequently affected sites, while the mandibular condyle, coronoid process, orbits, and facial skin are affected much more rarely. Intranasal dental eruptions are another of the more unusual ectopic teeth, which present in the nasal cavity and are quite rare. The etiology of ectopic eruption is still unclear and many theories have been suggested including trauma, infection, cyst, tumor, crowding, and developmental abnormalities. In many cases, however, the etiology cannot be identified. Ectopic eruption of teeth and may cause a variety of symptoms and complications. Clinical examination and radiographic imaging are extremely helpful in making the diagnosis. After complete evaluation, removal of the ectopic tooth is appropriate in order to prevent further complications.
Conclusions: The etiologic, clinical, radiographic aspects and treatment for these teeth will be discussed in this lecture.

FC266

The Titanium Meshes Effectiveness in Reconstructing Three-Dimensional Alveolar Defects

Giuseppe Lizio[1], Noemi Mazzone[2], Giuseppe Corinaldesi[1], Claudio Marchetti[1]
[1]*Department of Biomedical and Neuromotor Science, Oral and Maxillofacial Surgery Division, University of Bologna, Bologna, Italy,* [2]*School in Maxillofacial Surgery, University of Rome "La Sapienza", Rome, Italy*

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: This study evaluated the effectiveness of titanium mesh used with particulate autogenous and anorganic bovine bone (ABB) grafting in the reconstruction of three-dimensional (3D) alveolar ridge defects for implant-borne prosthetic rehabilitation.
Materials and methods: This retrospective study included 24 patients (mean age: 50.5 years) with varied morphological defects, treated with 34 titanium meshes and particulate bone (70:30 mixture of autogenous bone and ABB) and rehabilitated at least 8–9 months thereafter with the placement of 88 implants. Data were collected from the post-surgical period before implant placement, and the implant survival, success and prosthetic outcomes were assessed after a mean follow-up of 20 (6–48) months of prosthetic loading.
Results: Four of 34 meshes in three patients had to be removed before implant placement (11.76% total failure); 20 of 34 meshes were exposed due to soft tissue dehiscence (58.82% of complications): four (11.77%) prematurely (within 4–6 weeks) and 16 (47.05%) delayed (after 4–6 weeks), with no compromise in implant placement or prosthetic plan. None of the 88 implants was lost during follow-up (100% implant survival) and 15 implants demonstrated increased bone loss, yielding a cumulative implant success rate of 82.9%.
Conclusions: Bone grafting with titanium mesh and autogenous and ABB allows predictable implant-borne rehabilitation in morphologically varied three-dimensional defects. The high level of dehiscence that occurred 2 months post-operatively did not compromise subsequent implant-borne prosthetic rehabilitation.

FC267
Treatment of Peri-implant Mucosal Hyperplasia Using Er:YAG (2940 nm) Laser
Zekai Yaman[1], Pınar Cebe[1], Mümin Güneş[2], Berkay Tolga Süer[3]
[1]*American Hospital Dental Department, Istanbul,* [2]*MedAmerican Policlinic Dental Department, Istanbul,* [3]*GMMA, Haydarpasa Teaching Hospital, Istanbul*

Aim: The aim of this study was to evaluate the clinical efficiency of using an Er:YAG laser in the treatment of patients with peri-implant mucosal hyperplasia.
Materials and methods: 32 cases of peri-implant hyperplasia in nineteen patients (mean age 49 ± 10 years; 12 male, 7 female) were included in the study. Treatment was with an Er:YAG (2940 nm) laser unit that was set to either; 80–120 mJ, 10–15 Hz, and 1000 μs pulse duration without water for soft tissue ablation, or 60–120 mJ, 10 Hz, and 300 μs pulse duration with water for debridement and detoxification of the exposed abutment-implant surfaces. All patients' surgical charts, follow-up charts, clinical photographs and radiological findings were evaluated retrospectively.
Results: Hyperplasia was mostly associated with an inadequate amount of keratinized mucosa (≤2 mm; 71.9%) around the neck of the implants. Of the patients that were included in the study; three (15.8%) reported moderate pain (≤6 out of 10 in VAS scale), 16 (84.2%) reported mild or no pain (≤3 out of 10 in VAS scale) following surgery. Upon probing, bleeding scores were markedly reduced and pseudo-pocket formations had been eliminated with the formation of healthy, fixed gingiva.
Conclusions: These results suggest that the use of a Er:YAG laser is an effective method for the ablation of peri-implant mucosal hyperplasia with the avoidance of any thermal side effects to the adjacent soft tissues and implants.

FC268
Unusual Case of Facial Asymmetry
Reem Hanna[1], Christoph Huppa[2]
[1]*Department of Oral Surgery, King's College Hospital, King's College London Dental Institute, London, UK,* [2]*Department of Oral and Maxillofacial Surgery, King's College Hospital, London, UK*

Aim: Fibrous dysplasia is a non-neoplastic lesion of unknown origin with one-fourth involving head and neck. Fibrous dysplasia is an idiopathic disease, which causes progressive expansion and deformity of bones. In 10% of monostotic fibrous dysplasia and 50–100% of polyostotic fibrous dysplasia, there is involvement of the facial and cranial bones.
Case: A case of monostotic fibrous dysplasia in a 19 years old female who presented to the Oral Surgery Department at King's College Hospital in Feb. 2010 with swelling of left side of the face, which was noticed by the patient 18 months ago. The aim of presenting this case is to report this unusual left facial asymmetry, describing its clinical presentation, radiological features (standard radiographs and CBCT), histopathological appearance and its multidisplinary management approach. The patient had a biopsy of the lesion in region of the upper left first and second molar regions to confirm diagnosis. 3D CBCT imaging was obtained to assess the extension of the bony lesion. Neurological and ophthalmological assessments were carried out. The management of this case was approached by multidisplinary team who has taken in account the extension of the bony lesion and the patient's choice and wish (sometimes surgery is not the treatment of choice patient's prespective).
Conclusions: To conclude, fibrous dysplasia is a benign lesion, which rarely affects the head and neck region. Moreover, the involvement of the paranasal sinuses is rare. Therefore, multidisplinary approach to the management of this lesion is crucial to achieve a good outcome and quality of life

Free Communication Session 43 | B360 | 30.08.2013 | 14:00–15:00

Theme: General Dentistry and Oral Health

FC269
An Assessment of Prescription Writing Skill in Undergraduate Dental Students
Ashfaq Akram[1], Nabishah B. Mohamad[2], Dalia Abdullah[2], Noor Hashim[1], Subahan M. Meerah[2]
[1]*Faculty of Dentistry, Allianze University College of Medical Sciences, Penang, Malaysia,* [2]*Department of Medical Education, Universiti Kebangsaan Malaysia (UKM), Malaysia*

Aim: To assess the prescription writing skill in undergraduate dental students.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Methods: A descriptive study of 'two-group post-test experiment' taking 37 undergraduate dental students was conducted. Group A (n = 18) received a lecture on how to write a complete prescription while group B (n = 19) served as control group. Three dental scenarios about a child, pregnant woman and adult man were given to write mock prescriptions [(Group A (n = 54) and Group B (n = 57)]. Twelve components in each hand written prescription were assessed by using WHO guidelines.
Results: The improvements (less omission errors) in eight out of twelve elements in prescriptions of Group A were found. The significant improved elements were the symbol 'Rx' (39.8%) (p = 0.001), prescriber's signature (75.3%) (p = 0.001), date with prescriber's signature (54.6%) (p = 0.001) and prescriber's registration (30.5%) (p = 0.001). In addition, provision of elements such as 'date of issue' (13.9%), 'legibility of medicine' (7%), 'instruction for refill' (12%) and 'direction to use' (0.3%) were improved also in Group A.
Conclusion: The fifty percent prescribing skill of Group A improved due to intervening of a lecture. A specific teaching module on prescription writing is suggested to make dental graduates competent in prescription writing for the sake of well being of dental patients.

FC270

Capacity of Kenyan Health Facilities for Decentralized Dental Training

Marjorie Kaswii Muasya[1], Tom Mboya Dienya[2], Evelyn Gaceri Wagaiyu[3], Mara Child[4], Raphael K. Mburu[5], Ruth W. Nduati[6], Kefa Ogonyo Bosire[7], Walter Otieno Mwanda[8], M'mimunya Machoki[5], James N. Kiarie[5]
[1]*Department of Paediatric dentistry & Orthodontics, University of Nairobi, Nairobi, Kenya,* [2]*Department of Conservative and Prosthetic dentistry, University of Nairobi, Nairobi, Kenya,* [3]*Department of Periodontology, Community and Preventive dentistry, University of Nairobi, Nairobi, Kenya,* [4]*Department of Global Health, University of Washington,* [5]*Department of Obstetrics and Gynaecology, University of Nairobi, Nairobi, Kenya,* [6]*Department of Paediatrics and child health, University of Nairobi, Nairobi, Kenya,* [7]*Department of Pharmacology and Pharmacognosy, University of Nairobi, Nairobi, Kenya,* [8]*Department of Haematology and Blood transfusion, University of Nairobi, Nairobi, Kenya*

Aim: To determine the capacity of 6 non-tertiary Kenyan hospitals as sites for decentralised dental education.
Materials and methods: A questionnaire was developed to assess the capacity of a decentralised site prior to students undertaking a clinical rotation within it. Using this, a baseline assessment of six dental departments in six health facilities that had been enrolled by the partnership for innovative medical education in Kenya (PRIME-K) as sites for training of medical students was conducted. The facilities were assessed for manpower, patient load, diversity of oral health services, basic dental equipment, continuing dental education and research using the questionnaire and key informant interviews with the heads of the dental department.
Results: All the facilities assessed had general dentists while only one hospital had two dental specialists rendering oral health care to 20–50 patients per day. Five out of the six facilities had capacity for students to gain learning experiences in greater than 60% of the clinical disciplines studied during the 3rd and 4th year of the undergraduate curriculum. All the facilities had challenges of lack of specialists, broken down dental equipment and inadequate materials. Dentists in one facility had a continuing professional development (CPD) program in oral health while those in other facilities participated in CPD programs targeting all health workers. None of the facilities had ongoing research in oral health although in one facility a proposal was being developed.
Conclusion: Five health facilities had variable capacity as sites for decentralized dental education despite major resource constraints.

FC271

Internationally Trained Dental Programs in the United States of America

Ival G. Mcdermott, Rosa Chaviano Moran
New Jersey Dental School, University of Medicine and Dentistry of New Jersey

Aim: Health professionals educated outside of North America comprise an invaluable resource of expertise and manpower for many health care modalities in the United States. But in almost every jurisdiction in the USA, dentistry is controlled by a State Licensure Board, which requires a DDS or DMD degree from an accredited North American dental school in order to issue a license to practice dentistry. Dentists educated in other countries have been readily accepted in US specialty residencies and postdoctoral programs, but had no path toward full licensure to practice dentistry other than to complete 4 years of undergraduate dental school.

In response to growing issues of diversity in population and access to dental care, more than thirty US and Canadian dental schools have now begun to offer advanced standing programs which award the DMD or DDS degree to international dental graduates in an abbreviated time period. Not surprisingly, these programs have become so popular and widespread that the American Dental Education Association has created a centralized online clearinghouse for international program information and application.
Conclusion: This presentation will examine American dental schools' international programs and their status today. It will focus specifically on the very successful UMDNJ New Jersey Dental School Internationally Trained Doctor of Dental Medicine Program and its requirements, curriculum, and experience to date.

FC272

Is evidence based practice implemented by todays' European students?

Elpida Samara[1], Dimitrios Tatsis[1], Richard Oliver[2]
[1]*School of Dentistry, Aristotle University of Thessaloniki, Thessaloniki, Greece,* [2]*Hon. Consultant in Orthodontics, School of Postgraduate Medical and Dental Education Cardiff University, Cardiff, UK*

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: The aim of this study is to explore the students' perspective of evidence based practice and the implementation of it in the clinical practice.
Materials and methods: An anonymous questionnaire was placed online for 55 days. A statement of informed consent was included. Students from member countries of the European Dental Students' Association were invited to respond. It included basic demographic questions, the length and year of study as well as questions about their experience and their opinion about the academic books, online scientific articles, and conferences on clinical practice, hours spent for studying at home and at the university library, possible factors affecting the treatment plan and the methods they implement when planning treatments.
Results: Four hundred twenty students replied from twenty one European countries. Thirty percent of them were fourth year students. Responses from students of different European countries didn't vary and showed that students tend to stick to the knowledge provided by their teachers' whether it is contemporaneous or not. Seventy nine percent of the students answered that they use Medline for acquiring useful knowledge for clinical work less than once per week which is low compared to the total number of articles published every day.
Conclusions: Evidence-based clinical dentistry for students nowadays appears to be what is taught from their teachers at the university. Thus the teachers' role becomes crucial in order to provide knowledge that is updated and develop students' critical thinking towards new techniques, materials and scientific knowledge on a daily basis.

FC273
Research in Evidence-Based Dentistry for the General Practice
Francesco Chiappelli[1], Olivia Cajulis[2]
[1]*University of California at Los Angeles – Dentistry,* [2]*Dental Group of Sherman Oaks*

Purpose: This study compares assessing the quality of the evidence vs. appraising the quality of the revisions of clinical guidelines in evidence-based clinical decisions.
Methods: The reliability and the validity of the Risk of Bias tool proposed by AHRQ and commonly used in evidence-based dentistry are examined. The instrument rates the quality of the evidence along 6 domains in a dichotomous format. Inter-rater reliability (Pearson r) and coefficient of agreement (Cohen kappa) are obtained. Content validity is analyzed, and criterion validity is established against the AGREE II, a tool to appraise revised clinical practice guidelines along 27 items scored in Likert 1-7 format.
Results: Standardized readers ensure over 80% explained shared variance. Validity of the Risk of Bias instrument can only be established by examining each domain individually because of the complexity of its meta-construct. Content validity is improved by the addition of 6–10 items each domain. Reliability measures require modification of the scoring criteria to a semi-continuous scale. Criterion validity emphasize the value of the Risk of Bias instrument, and its need for further psychometric improvement.
Conclusion: The effectiveness of evidence-based dentistry as a new model for the general dentistry practice must be established. For this, the methodology for obtaining the best available evidence must be streamlined and verified. Our data are compelling in showing that the Risk of Bias tool must be further validated before it can yield evidence-based revisions of clinical practice guidelines that can be used in the practice of every-day general dentistry.

Free Communication Session 44 | B343 | 30.08.2013 | 15:30–16:30

Theme: General Dentistry and Oral Health

FC274
Patients preference according to doctors gender and age
Jeta Kelmendi[1], Nora Berisha[1], Merita Berisha[2], Resmije Ademi[1]
[1]*Department of Dentistry, University of Prishtina Faculty of Medicine,* [2]*National Institute of Public Health of Kosova, Department of Social Medicine, University of Prishtina, Medical Faculty*

Background: Female doctors appear to communicate differently with their patients than male doctors, it is unclear how communication style affects patient satisfaction. Some studies have shown that female doctors spend more time with their patients than male doctors, but other studies have contradicted these results. The aim of this study was to explore and describe patients preferences about the gender and the age of doctors before and after the treatment, also their satisfaction for their treatment.
Material and methods: One hundred and thirty-nine patients participated voluntary in this research, in University Dentistry Clinical Center of Kosovo. The patients were asked to complete a questionnaire prepared especially for this research, before entering the intervention rooms and after they had their intervention.
Results: From the total number of patients 56.8% were female. The reason they came for a check-up was pain in 54.7%. From the whole sample 67.7% had their intervention in the department of oral surgery wile the other percentage had their intervention in the department of dental pathology and endodontics. Before extraction in oral surgery the most preferred gender was male with 58.1%, the extraction was performed in 52.7% from female doctors and after the intervention 51.4% preferred female doctors.
Conclusion: From our result we can conclude that the most percentage of patients visit their doctors when they are in pain. Also the patients who had extractions changed their preference according to the gender. Also to work with patients to eliminate the stigma in believing that only in male doctors can perform extraction.

FC275
Reducing the Colonization of Bacteria in Dental Unit Waterlines and Wastewaters
Resmiye Ebru Tirali[1], Ömer Engin Bulut[2], Gülcin Akca[3]
[1]*Department of Paediatric Dentistry, Baskent University, Ankara, Turkey,* [2]*Department of Oral and Maxillofacial Surgery, Baskent University, Ankara, Turkey,* [3]*Department of Oral Microbiology, Gazi University, Ankara, Turkey*

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aims: The purpose of this study was to investigate the effect of an automatic adjusting of hydrogen peroxide Colloidal-Ag dose system to reduce colonization and growth of heterotrophic bacteria in dental unit waterlines and wastewaters.
Methods: Thirty dental units were included to the study; 20 units were selected for first (automatic administration) and second treatment group (manuel administration) and 10 units served as controls (Group 3). Water samples were collected every week during the 10 weeks. For Group 1 and 3 the samples were collected both from DUWLs and waste waters. For group 2 only DUWLs samples were collected. They were inoculated onto various specific agar media and incubated at 28–37°C for 2–7 days. After counting the colonies of microorganisms, they were identified and the mean numbers were determined as cfu/ml. Electron microscopic analysis was also perfomed for detection of biofilm formation.
Results: There was no significant difference between the treatment groups's DUWLs and had counts of less than 200 CFU/ml. A statistically significant differences in median total viable counts reduction was found between the treatment and control groups's DUWLs for all weeks ($p < 0.01$). But there was no significant difference between Group 1 and control group's waste waters.
Conclusions: The system of automatic adjusting dose of Hydrogen peroxide colloidal-Ag has been found to be effective as manuel aplication of the material for improving the dental unit waterlines1–4. However, none of these systems has not proved enough antibacterial effect for dental unit wastewaters.

FC276

Smoking among Dental Students in Tunisia

Fethi Maatouk, Hichem Ghedira, Ahlem Baaziz
Department of Pediatric Dentistry, School of Dentistry, Monastir University, Tunisia

The World Health Organization stated in 2008 that Tobacco is one of the most preventable causes of disability and death in the world. Facing this situation, the role of health professionals in preventing smoking is very important. However, many studies reported that the prevalence of smoking among them is the same as that of the general population.
Aim: The aim of the present study was to estimate the prevalence of smoking and to assess the behaviour, knowledge and attitudes among dental students in Tunisia concerning this issue.
Methods: A study was conducted at the School of Dentistry during November 2008 among 1123 students (777 girls and 346 boys) aged from 18 to 28 years.
Results: Nearly 14% of students were smokers (11.8% boys and 2.4% girls – $p < 10–9$) consuming an average of 16 cigarettes daily. The age of the first cigarette varied from 8 to 21 years (16 ± 2.3 years). Among the students smokers, 66.5% of the fathers and 3% of the mothers were also smokers.
Conclusion: In our study, the smokers' percentage was lower than that noted in Tunisian medical students. However, the prevalence of smoking was more frequent in male as shown by many authors. Dentists can be effective in helping their patients quit smoking. The study findings revealed a critical need and opportunity to include comprehensive cessation by counselling training in the dental school curriculum.

FC277

Interdisciplinary Approaches to Diagnosis of Functional Statement of Dental System

Evgeny Solovykh, Elena Ivanova, Natalia Fokina
Department of General Dentistry, Moscow State University of Medicine and Dentistry, Moscow, Russia

Aim: To find new method of diagnosis and describe main characteristics of the functional statement of the patients in dentistry.
Material and methods: Results of studies of the functional status of the dentition postural and autonomic nervous systems in 251 patients (129 men and 122 women) aged 20–60 years was carried out. All patients were precisely examined to accordance of the rules of clinical dentistry.European stabilometry variant was used for investigation postural system. Electromyography was used for examination functional statement masseter and temporal chewing muscles. Functional statement of the autonomic nervous systemswas estimated by electrocardiography, electrodermatography, breathing movements and fotopletismography.
Results: The patients could be distributed into two groups by the results of cluster analysis. By functional parameters, groups 1 and 2 could be defined as patients with decompensated and compensated functional status, respectively. The characteristics of the functional status of patients in the two groups are presented.Furthermore were find some correlation between the functional parameters of the dental postural and autonomic nervous systems in each group of the patients. It supported\benefited to find new diagnostic parameters of the functional statement of patientsand explain pathogenesis influence between systems.
Conclusion: The function statement of the dental, postural and autonomic nervous system are closely interrelated and can be used as one of the most important diagnosis parameters.

FC278

Switching to CBCT: Is it Beneficial to the Dental Practitioner?

Mushira Mohamed Dahaba, Sahar Hosni, Nagla'a Abdelwahed Abdelwahed, Reham Mohamed Hamdy, Ahmad Mohamed Abdalsamad, Yara Rabia Helaly
Department of Oral & Maxillofacial Radiology, Cairo University, Cairo, Egypt

Introduction: An overview of cone beam computed tomography (CBCT) and its role in orofacial imaging is provided, including comparison with conventional and volumetric computed tomography (CT). The results of several studies conducted at the Oral and Maxillofacial Radiology Department, where the researches were conducted, are summarized.

Using CBCT for the pre- and postoperative implant site assessment necessitates following certain protocols in order to obtain standardization and hence accurate linear and densitometric measurements of jaw bones. Such protocols were established.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

The accuracy of CBCT in detecting the actual extension and location of lesions affecting the maxillofacial region as well as the perforation of cortical boundaries was evaluated.

CBCT's ability in revealing the bony components of the Temporomandibular joint was also examined.

Conclusion: It was concluded that it's essential for all dental and orofacial clinicians to be familiar with CBCT imaging. However, the responsibilities and the radiological skill levels of clinicians involved in imaging require consideration.

Free Communication Session 45 | B343 | 30.08.2013 | 15:30–16:30

Theme: Implantology: Implantology

FC279

My Guiding Principles For Long Term Implant Success

Mahmood Hussain Qureshi
Pakistan Academy of Implant Dentistry

Aim: Implantology has been filled with many diverse ideas, whims, or commercially endorsed commodities and thoughts. Over the past 60 years of implantology, more than 80% of topics, which one time were the most highly promoted, proved to be the clinical failures and are so discarded.

Material and methods: This presentation is designed to help create an awareness of the realities of implant treatment and to teach practitioners the simplest ways to adequately treat the most commonly encountered problems related to Implantology. Based on the presenter's 20 years of clinical implantology practice and teaching experience, 20 guidelines will be presented to avoid most of the causes leading to implant complications and failures.

Conclusions: In pursuance of perfection and a comprehensive solution these fundamental steps will provide a successful long term and a predictable solution for implant placement thus gratifying our ambition of the restoration and preservation of patient's oral soft and hard tissues to acceptable levels.

FC280

Photoelastic Stress Analysis of 3 Implant Retained Mandibular Overdentures

Bülent Uludağ[1], Emre Tokar[2]
[1]*Department of Prosthodontics, Ankara University, Ankara, Turkey,* [2]*Department of Prosthodontics, Gazi University, Ankara, Turkey*

Aim: Aim of the study was to evaluate stress distribution of three implant retained mandibular overdentures with various attachment systems.

Materials and methods: A photoelastic model of an edentulous mandible with three implants was fabricated with a photoelastic resin. The implants were placed interforaminal region. Distal implants were set 200 inclinations corresponding to center implant. The interimplant distance among three implants was 11 mm. Three attachment systems were studied on the model: 1) Bar, 2) Bar - Ball, 3) Bar - Rk-1. 100N vertical load was applied to central fossa of right first molar of the overdentures. The stress distribution of the model was recorded photographically with circular polariscope for each design.

Results: The moderate stress level was observed for each design. Lowest stress was transferred to implants with bar attachment among all attachment system.

Conclusions: A bar with distally placed Rk-1 attachment design was transmitted less stress to implants compared to bar with distally placed attachment design. The study was shown that bar with distally placed Rk-1 attachment design is an alternative choice to bar with distally placed ball attachment design.

FC281

Predictable Prognosis of Immediate Implant Placement for Retained Deciduous

Siti Mariam Ab Ghani[1], Graeme Lillywhite[2]
[1]*Universiti Teknologi MARA UiTM, Malaysia,* [2]*Edinburgh Dental Institute, United Kingdom*

Aim: This case report describes the appropriate planning prior immediate implant placement and restoration replacing retained deciduous (upper E's).

Methods: Assessment of the occlusion, space distribution, surrounding soft tissue and patient's expectation of resultant aesthetic were done prior treatment. Pre-treatment casts were made and mounted on the articulator for diagnostic wax-up and fabrication of surgical template.

The surgical template was used during the surgery to clearly locate the position of implants (occlusally and gingivally). Prosthetic stage was done using the Direct Abutment API (all parts included) till the stage of temporization. Assessment of the aesthetic and occlusion of the cemented provisional was done by keeping the provisional out of contact in all excursions. Patient reported no discomfort during the 1-week review. Further appointments were given to mould the peri-implant soft tissue before the final restoration stage. Material selection for the final restorations was cement-retained porcelain fused to precious metal.

Results: There are sufficient data available to support the concept that immediately restored and loaded implants for single tooth situations can achieve integration using many implant systems and protocols. Many authors have concluded that aesthetic results in immediately loaded sites are superior to that achieved with a staged approach due to the gingival architecture preservation in every stage.

Conclusions: Clinicians will have a higher chance of success with appropriate treatment planning, incorporating all the clinical data and understanding the limitations imposed. Selection and risk/benefit analysis for each patient prior treatment will also lead to a more predictable and desirable outcomes.

FC282

Resorbable versus nonresorbable barrier with immediate implantation after functional loading

Sahar Elkholy[1], Husien Elsharkawy[2]
[1]*Department of removable prosthodontics, Pharos University, Alexandria, Egypt,* [2]*Prosthodontics department, Cairo Uinversity, Cairo, Egypt*

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim of the study: Was to evaluate of the bone height and bone density of peri implant area with resorbable and nonresorbable barriers as guided tissue regeneration with immediate implants after functional loading under mandibular overdenture.
Materials and methods: Eight male patients (the age ranged between 45 and 60 years old) had the upper jaw was fully edentulous and the lower jaw had only two remaining canines and indicated for extractions were selected. Each patient was received two immediate implants after extraction of remaining canines and was divided into two groups. Group I: the left side was received nonresorbable barrier and Group II: the right side was received resorbable barrier. Radiographic evaluation was done for marginal bone height loss and bone density immediately after overdenture insertion and 6 months later.
Results: Mean marginal bone loss with unresorbable barriers was 0.7 ± 0.16 mm and 0.6 ± 0.1 mm with resorbable barrier with non-significant difference between two groups. There was significant increase in bone density with resorbable barrier after 6 months of functional loading with significant difference between two groups.
Conclusion: There was no difference in marginal bone height changes between resorbable and nonresorbable barriers with immediate implant under overdenture after 6 months of functional loading but bone density increased with the use of resorbable barrier over non resorbable barriers. Using of resorbable barrier with immediate implantation did not need second stage surgery for removing the barrier as with non- resorbable one.

FC283
Clinical evaluation of submerged and nonsubmerged implants for single-tooth replacements
Secil Karakoca Nemli, Merve Bankoğlu Güngör, Cemal Aydın, Handan Yılmaz, İrem Türkcan, Hişam Demirköprülü
Department of Prosthodontics, Gazi University, Ankara, Turkey

Purpose: The aim of this study was to evaluate clinical and radiographical results of submerged and nonsubmerged implants for single-tooth replacements and to assess patient-based outcomes.
Material-methods: Twenty patients included in the study, using a split-mouth design, implants inserted using submerged technique compared with nonsubmerged technique. Implants were restored with metal-ceramic crowns after 3 months. At baseline, 6, 12 and 24 months, reconstructions were examined. Standardized radiographs were made, radiographic crestal bone level changes were calculated as well as soft tissue parameters included pocket probing depth (PPD), bleeding on probing (BoP), plaque index (PI), and gingival index (GI). Results were statistically analyzed by two-way repeated measures of variance (ANOVA). To evaluate patient-based outcomes, patients were asked to complete a questionnaire at 6-month follow-up. Wilcoxon paired signed rank test was used to compare scores.
Results: Data of 18 patients were reviewed. Two-way ANOVA showed significant influence of technique ($p < 0.01$). During 24 months, nonsubmerged implants (0.57 ± 0.21 mm) showed significantly lower bone loss than submerged implants (0.68 ± 0.22 mm). Between examinations, there was an average of 0.2 mm bone loss ($p < 0.05$). During study, PI and BOP were not significantly different for groups; PPD of nonsubmerged implants were significantly lower than submerged. GI of the nonsubmerged implants were significantly lower than submerged at 24 months. Patient satisfaction with nonsubmerged implants (median 87.5) was generally significantly higher than submerged implants (median 81.5) ($p < 0.01$).
Conclusions: Nonsubmerged implants showed comparable clinical results with submerged implants, furthermore resulted in higher patient satisfaction due to decreased surgical intervention.

Free Communication Session 46 | B360 | 30.08.2013 | 15:30–16:30

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

FC284
Gradual vs. Immediate Restoration of Occlusal Vertical Dimension
Mai Salah Eldin[1], Mohamed Sherine Elattar[2], Aly Mahmoud Aly[2], Enas Mohamed Shahine[3], Sahar Elkholy[1]
[1]Department of removable prosthodontics, Pharos University, Alexandria, Egypt, [2]Department of Removable Prosthodontics, Faculty of Dentistry, Alexandria university, Alexandria, Egypt, [3]Department of Physical medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Alexandria University, Alexandria, Egypt

Aim of Study: To evaluate clinical and electromyographic influence of gradual versus immediate increase in vertical dimension in patients with temporomandibular joint disorders.
Materials and methods: Twenty patients (with age ranged between 55–65 years) had complete denture with reduced occlusal vertical dimension and signs and symptoms related to the diagnosis of temporomandibular joint disorders. They divided into two groups, each group included ten patients. Group I: Where the occlusal vertical dimension was restored gradually 2 mm for 3 weeks, then was restored to a range of another 3 mm according to the inter-occlusal distance of each patient.

Group II: Where the occlusal vertical dimension was restored immediately to a range of 5 mm according to the inter-occlusal distance of each patient. Both clinical (using The Anamnestic Dysfunction Index Ai)and electromyographic (masseter and temporalis muscles) evaluations were carried out for every patient after 3 weeks, 2 months and 6 months and then clinical evaluation was carried out every month for other 6 months for every patient under study.
Results: Showed that, there was insignificant difference between clinical and electromyographic evaluations of the two groups for improving the clinical symptoms of TMDs, but there was significant increase in activity of the muscles at the follow up after 2 and 6 months with insignificant difference between two groups.
Conclusion: Gradual and immediate restoration of the occlusal vertical dimension could improve the clinical symptoms of TMDs at the same manner. however the immediate restoration was less time consuming and patients were less subjected to clinical procedures.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

FC285

Improve Surface Topography of Silicone Elastomer for Maxillofacial Prostheses

Salah Khalaf Al Rawi[1,2], Zaihan Ariffin[2], Adam Husein[2], Fazal Reza[2]

[1]*Improve Surface Topography of Silicone Elastomer for Maxillofacial Prostheses,* [2]*Prosthodontic Department, Faculty of Dentistry, Universiti Sains Malaysia*

Introduction: Maxillofacial losses caused by trauma or postresection surgery are commonly replaced by silicone elastomers. The gypsum mold surface cannot be rendered smooth and this is reflected on the prosthesis surface. This high surface roughness enhances the bacterial adhesion and growth.

Objective: The objective of this study was to coating of gypsum mold in order to improve surface roughness of silicone elastomeric material.

Methods: Laboratory gypsum mold flask surface was coated by clear aerosol acrylic spray by following the manufacturer instructions. The coated molds were used to produce experimental samples of maxillo-facial silicone elastomers. The surface roughness of the newly formed silicon elastomers were compared to other samples prepared by the conventional methods by using the atomic force microscope (AFM). Scanning Electron Microscope (SEM) was used to evaluate topographical of both silicone elastomers and die stone gypsum samples. The differences in roughness between coated and non-coated mold surface were analyzed using t-test ($p < 0.05$).

Results: T-test showed that there is significant difference in the surface roughness between the silicon elastomers prepared by the conventional die stone molds and in the processed molds, ($p < 0.0001$). The AFM and SEM showed clear difference in the surface smoothness.

Conclusions: Lower surface roughness and highly smooth surface of silicone elastomers can be obtained simply by coating the die stone gypsum mold with acrylic spray.

FC286

Panoramic Radiograpic Findings of Implant-supported Mandibular Overdentures

Aydan Avşar[1], Rana Nalçacı[1], Zeynep Yeğin[2], Sadullah Üçtaşlı[2]

[1]*Department of Oral and Maxillofacial Radiology, Ankara University Faculty of Dentistry, Ankara, Turkey,* [2]*Department of Prosthetic Dentistry, Ankara University Faculty of Dentistry, Ankara, Turkey*

Objective: The aim of this study was to evaluate edentulous patients with panoramic radiog-raphy who would receive maxillary complete denture opposed to two-implant-supported mandibular overdenture.

Subjects and methods: In this study, 197(101 male – 96 female) patients, ages ranged from 60 to 75 years, have attended the University of Ankara, Faculty of Dentistry for routine dental treatment.

A dental panoramic radiograph was taken from each patient using the same X-ray machine (Planmeca pan/ceph, Finland). Measurements on panoramic images carried out with Planmeca Romexis 3.0.0.R software. Marginal bone levels were radiographically deter-mined at four points between the mental foraminas. Additionally, the number of intrabony root remains and impacted teeth on panoramic radiographs were recorded.

The data was analyzed using SPSS for Windows Version 12.0.Analysis included fre-quency, cross tabulations, calculation of means Spearman's rho. Significance was set at the 5% level.

Results: The number of impacted teeth observed in females and males were 5 and 7, respectively. The number of intrabony root remains was 18 for females and 11 for males. There were no significant differences in gender for the number of impacted teeth and the number of intra-bony root remains.

The mean marginal bone levels measured between the two mental foramens was 18.51 ± 4.82 mm (min:4.83, max: 29.25) for males and 15.71+-4.46 (min 4.43, max 26.70)for females. There was a significant statistical difference for female gender.

Conclusions: Out of 197 patients 14 patients (7.1%) bone level between interforaminal areas were not suitable for two dental implant placement.

FC287

Microhardness and Surface Roughness of Denture Teeth Stored in Various Beverages

Şule Tuğba Özak, Pelin Özkan

Department of Prosthodontics, Ankara University, Ankara, Turkey

Aim: The purpose of this study was to evaluate the microhardness and surface roughness of four commercially available denture teeth using modified acrylic and composite resin materials against various beverages.

Method: Conventional acrylic resin, reinforced acrylic resin, microfiller composite resin, and nanofiller composite resin teeth were used. From each group of denture teeth, 10 maxillary first molars were immersed in 5 beverages (tea, filtered coffee, cola, cherry juice, and distilled water. The test period of 24 h appears comparable to approximately 1 month of normal beverage consumption. The test periods used in this study were arranged according to this protocol and 1 week, 1 month, 3 months and 6 months of normal beverage consumptions were simulated. Vickers microhardness and surface roughness of denture teeth were measured for each test period. The differences of each value were calculated by one-way ANOVA statistically.

Results: The microhardness values significantly decreased in all beverages especially in 6th month (Tukey HSD test, $p < 0.01$). The surface roughness values significantly increased in all beverages especially in 3th month (Tukey HSD test, $p < 0.01$). There were no statistically significant differences between the beverages (Friedman test, $p > 0.01$). Microfiller composite resin denture teeth had the highest microhardness values and the lowest surface roughness values (Tukey HSD test, $p < 0.01$).

Conclusions: Within the limitations of this study, daily intake of common beverages may change the surface characteristics and microhardness of denture teeth. To improve these mechanical and physical properties new artificial teeth have been developed by controlling the filler particles and polymer matrix.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

FC288

Shear Bond Strength of Metal Brackets to Different Ceramics

Pinar Cevik[1], Nejla Karacam[2], Oguz Eraslan[1], Zafer Sari[3]
[1]*Department of Prosthodontics, Selcuk University, Konya, Turkey,* [2]*Department of Orthodontics, Selcuk University, Konya, Turkey,* [3]*Department of Orthodontics, Akdeniz University, Antalya, Turkey*

Aim: The aims of this study were to investigate the effects of various surface-conditioning methods on the surface roughness of ceramics and on the shear bond strength (SBS) of metal brackets bonded to different all-ceramic materials.

Materials and methods: Sixty glazed feldspathic and 60 glazed IPS e-max discs were used in this in vitro study. These two groups divided into six subgroups for surface preparation (n = 10). The specimens were examined following surface-conditioning methods based on the surface treatments: Only silane, 37.5% orthophosphoric acid with silane, diamond burr with silane, 50 μm Al2O3 air abrasion with silane, 9.6% hydrofloric acid with silane and Nd-YAG laser irradiation with silane.

Surface topographies of one specimen of each group was observed by atomic force microscopy. Surface roughness (Ra) values were measured using a profilometer. Metal brackets were bonded to the ceramic surfaces with a light cure composite. The samples were stored in distilled water for 24 h and thermocycled. The SBS of the brackets was measured with an Instron universal testing machine.

Result: For surface roughness, even as, there were no statistically differences between ceramic groups (p = 0.068), there were statistically differences between preparation groups (p = 0.000). Group sandblasting had rougher surfaces compared with those in the other groups. For SBS values, there were no statistically differences between ceramic groups (p = 0.376), there were statistically differences between preparation groups (p = 0.000). Group sandblasting had higher values than those in the other groups.

POSTER DISCUSSION SESSIONS

Poster Discussion Session 01 | B332 | 30.08.2013 | 14:00–15:00

Theme: Dental Treatment & Restorative Dentistry: Pedodontics

PD001

Systemic and Local Ornidazole in the Treatment of Chronic Periodontitis

Soulafa Mohamed Belal[1], Safenaz Saleh Saied[2], Magda Kamal Khalil[3]
[1]*Ministry of Egyptian health-El-gharbia-Egypt,* [2]*Oral medicine, Periodontology, Oral diagnosis & Radiology Department- Faculty of Dentistry-Tanta University-Egypt,* [3]*Pharmaceutical Technology Department-Faculty of Pharmacy-Tanta University-Egypt*

Aim: To assess the clinical and microbiological effects of systemic ornidazole versus local in-situ gel ornidazole as an adjunctive to scaling and root planing (SRP) in the treatment of moderate to severe chronic periodontitis.

Materials & methods: Twenty-one patients (30–45 years old) consisting of 16 females and five males selected from the Periodontology Clinic of the Faculty, were randomized into three groups, seven patients in each group. Control group I patients received SRP only, test group II patients received SRP plus 500 mg of ornidazole twice daily (for 7 days), and test group III patients received SRP plus subgingivally delivered ornidazole carried upon chitosan gel after SRP. Clinical [plaque (PI) and bleeding (BOP) indexes, probing pocket depth (PPD), clinical attachment level (CAL)] and microbiological data [one-site pooled sample, processed by benzoyl-DL-arginine-naphthylamide (BANA) test] were collected at baseline, and 1, 3 and 6 months, post-therapy. Clinical variables were compared by ANOVA and microbiological variables by chi-square tests.

Results: All treatments modalities effectively reduced the signs of periodontitis. All clinical parameters and the subgingival microbiota showed significant reduction after SRP in all groups, with no significant difference between group II & group III at 1& 3 months, which become significant at 6 months in favor to group III.

Conclusions: Within the limitations of this study, the adjunctive use of systemic and local ornidazole in the treatment of chronic periodontitis demonstrated significant clinical and microbiological benefits when compared to SRP alone, and the ornidazole gel had a superior effect over its systemic form.

Theme: Dental Treatment & Restorative Dentistry: Endodontics

PD002

Determination of different EDTA Solutions on Root Dentin Tubule Penetration

Zeliha Yılmaz[1], Nuhan Puralı[2], Sevinç Aktemur Türker[3], Eda Ezgi Aslantaş[1], Hatice Doğan Buzoğlu[1]
[1]*Department of Endodontics, Faculty of Dentistry, Hacettepe University, Ankara, Turkey,* [2]*Department of Biophsics, Faculty of Medecine, Hacettepe University, Ankara, Turkey,* [3]*Department of Endodontics, Faculty of Dentistry, Bulent Ecevit University, Zonguldak, Turkey*

Objective: The aim of this study was to determine the effects of different EDTA solutions (EDTA, EDTA-T, REDTA) in root dentin tubule penetration.

Methods: The crowns of the 20 extracted human premolar teeth were removed and the root canals were prepared by using K files with step-back technique to the master apical file up to #50. The canals were irrigated with 2 ml 2.5% sodium hypochlorite (NaOCl) between each file size. After completion of the instrumentation, 5 ml 2.5% NaOCl was applied. All teeth were irrigated by using three different EDTA solutions as a final flush then the root canals were dried with #30 paper points. After final irrigation, each canal was irrigated with 1 ml, 0.1% RhodaminB solution. The teeth population were assigned into three groups (n = 6/group) with respect to the final irrigation technique employed: Group1: EDTA (5 ml, 17%), Group 2: EDTA-T (5 ml, 17%), Grup:3 REDTA (5 ml 17%). Two teeth were assigned as negative control which was irrigated only NaOCl (5 ml, 2.5%) as final irrigation. All teeth were embedded in acrylic resin block. 1 mm thick three

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

horizontal sections were taken from coronal to apical and then penetration depth was analyzed using a Confocal Laser Scanning Microscope. Differences among the experimental groups were analyzed using One-way ANOVA test ($p < 0.05$).
Results: There were no significantly differences between EDTA and surfactant added EDTA solutions on dentin tubule penetration ($p > 0.05$).
Conclusion: To add surfactant to EDTA was not enhanced the penetration depth of irrigation solution.

Theme: Dental Treatment & Restorative Dentistry: Materials

PD003
Microleakage Study of a Restorative Resin Through Radioisotopic Methods
Eunice Palmeirão Carrilho[1], Margarida Abrantes[1], Maria Filomena Botelho[1], João Casalta Lopes[1], Anabela Pereira Paula[1], Tânia Afonso[1], Carlos Miguel Marto[1], Diana Pires Rebelo[1], Joana Rita Marques[1], Mário Polido[2], Pedro Ambrósio[1], Manuel Marques Ferreira[1]
[1]Faculty of Medicine, University of Coimbra, Coimbra, Portugal, [2]Instituto Superior de Ciências da Saúde Egas Moniz, Caparica, Portugal

Aim: The purpose of this study was to evaluate the microleakage of the dental restorations using SonicFillTM (Kerr). The null hypothesis was that the type restorative system didn't have influence in what concerns to microleakage.
Method and materials: Sixty noncarious extracted human molars were selected for this study. The teeth were cut in two equal halves occlusogingivally. Class 5 cavities were prepared on the buccal or lingual surfaces of each tooth with gingival margin walls in enamel with cavity dimensions approximately 4 mm mesiodistally, 3 mm occlusogingivally and 3 mm depth. The specimens were divided randomly in four groups. Group 1 and 4 was restored with SonicFillTM (Kerr), while group 2 was restored with FiltekTM Supreme (3M ESPE). The control cavities in group 3 weren't restored. The specimens were stored in distilled water at 37°C for 7 days and after thermocycling 500 cycles between 5°C and 55°C with a dwell time of 30 s. 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 with nail polish. The specimens were submersed in a solution of 99mTc-Pertechnetate during 3 h. The radioactivity was counted using a well-type gamma counter and a gamma camera.
Results: Results showed that there were no statistically significant differences ($p > 0.05$) among the materials with respect to microleakage scores.
Conclusion: Based on the results of this study, the use of SonicFillTM (Kerr) doesn't reduce microleakage compared with conventional composites.

Theme: Dental Treatment & Restorative Dentistry: Materials

PD004
Degree of Conversion and Micro-hardness of Nano-hybrid Posterior Composites
Maha Ebrahim Elkorashy[1], Heba Abd Elhamid Shalaby[2], Monazah Gamal Khafagi[3]
[1]Department of Operative Dentistry, Nahda University, Banisuef, Egypt, [2]Department of Dental Biomaterials, Nahda University, Banisuef, Egypt, [3]Departments of Spectroscopy, Physics Division, National Research Center, Cairo, Egypt

Aim: An experiment aimed to study the influence of degree of conversion on micro-hardness values, at different curing distances, of two posterior nano-hybrid composites,
Materials and methods: Thirty discs of GC-G-aenial and GC-Kalore nano-hybrid posterior composites (n = 5 for each group) were prepared. Specimens (6 mm in diameter and 2 mm in height) were prepared in a copper mold, covered with mylar strip and polymerized for 40 s, at 3 curing distances: 0, 2 and 4 mm, utilizing halogen (500 mW/cm^2). The degree of conversion of each specimen was calculated by Furier transform infra-red spectroscopy and values of micro-hardness were measured. The resulted data were statistically analyzed by two way-ANOVA and Pearson's test.
Results: The results indicated that 1) Composite types showed insignificant difference of micro-hardness values with different curing distances; 2) at 2 mm curing distance, GC-Kalore showed significant decrease in micro-hardness values compared to GC-G-aenial (2.55 ± 0.15 and 3.05 ± 0.01 respectively); 3) GC-Kalore showed significant decrease in degree of conversion at 0 distance compared to GC-G-aenial (97.59 ± 0.10 and 98.03 ± 98.03 respectively).
Conclusion: Curing distances were passively affected degree of conversion of Nano-hybrid posterior composites consequently micro-hardness.

Theme: General Dentistry and Oral Health

PD005
Oral Health Indicators in Changing Dental Care System
Matveev Andrei[1], Leous Peter[2]
[1]Republican Dental Polyclinic, Ministry of Health, Minsk, Belarus, [2]Department of Community Dentistry, Belorussian State Medical University, Minsk, Belarus

Republic of Belarus has a population of 9.46 million (2012). Oral health services are provided in 1717 state dental establishments by 4595 dentists (stomatologists), of which 23% full or part-time private, and by 1540 dental therapists. Number of private dental clinics has increased from 26 in 1996 to 893 in 2012. In 2012 there were 14.057 million dental visits of which 6% – to private clinics. Aim of this study was to assess possible changes one of important oral health indicator – "Reasons for seeing a dentist" – in connection with changing dental care system from public to partly private.
Methods: The 1996 and 2012 annual reports on oral health care delivery in Belarus were analyzed, assessing reasons for dental

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

visits: check-up, or cleaning (CL), routine treatment (RT), emergency treatment (ET); average number of extracted permanent teeth per one inhabitant of the country were estimated.
Results: In 1996 years less than 1% of total dental visits were for "CL", 40% – for "RT", and 59% – for "ET"; av. 0.204 teeth/inhabitant were extracted. In 2012 years "CL" visits were 4.7%; "RT" – 63.1%; "ET" – 32.2%; av. 0.168 teeth/inhabitant were extracted.
Conclusion: It is proposed, that the oral health indicator "Reasons for seeing a dentist" in the country is improving in recent years and this trend coincided with the raising of private sector in the predominantly public oral health care system.

Theme: General Dentistry and Oral Health

PD006
Moral Dilemmas of Greek Dentists in Care Provision
Freideriki Paraskevi Vlachou[1], Evgenia Kontopoulou[1], Vassiliki Topitsoglou[1], Georgios Menexes[2], Sotirios Kalfas[1]
[1]School of Dentistry, Aristotle University of Thessaloniki, Thessaloniki, Greece, [2]School of Agriculture, Aristotle University of Thessaloniki, Thessaloniki, Greece

Aim-purpose: To explore the knowledge, views, and possible decisions of Greek dentists in relation to ethical dilemmas encountered upon treatment of specific patient cases, such as child abuse, treatment of HIV-infected patients and handling of patient recourse to justice.
Methods: A self-administered questionnaire has been distributed to 230 dentists working in the capital and second biggest city of the country during May-September 2011. For adequate response, personal contact with the dentists was sought and the questionnaires were given to them during a visit by one of the authors. One week later, the completed questionnaires were collected in a closed envelope upon a new visit.
Results: The majority (51.6%) of the 200 dentists responded would avoid contacting the authorities for abused child and they would try to solve the problem through discussion. About 10% of the dentists would act against the patient's interests to support a colleague, while 35% of them would avoid treating an HIV-infected patient, this avoidance being due to insufficient application of hygiene measures, as claimed by 10% of them. Almost 90% of the responders believe that <10% of mistreated patients would sued their dentists and that this reaction is best avoided if a friendly, not strictly professional, relation exists between the patient and the dentist.
Conclusion: A considerable number of Greek dentists express confusing aspects in ethical issues and appear to lack knowledge or will to handle certain uncomfortable situations.

Theme: Preventive Dentistry: Orthodontics

PD007
Serial Extraction in Early Treatment
Michele Tepedino[1], Vincenzo Quinzi[1], Iancu Maciej Potrubacz[1], Aida Meto[2], Claudio Chimenti[1]
[1]Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, Italy, [2]Department of Dentistry, Medical University of Aldent, Tirana, Albania

Aim: Serial extraction is an interceptive orthodontic procedure usually initiated in the early mixed dentition; it is designed to anticipate and minimize the development of a fully matured malocclusion in the permanent dentition, and it is accomplished by the extraction of certain deciduous and permanent teeth in an orderly sequence and predetermined pattern to guide the erupting permanent teeth into a more favourable position. It is successful if it minimizes orthodontic appliances needs. There are three possible extraction patterns, however serial extraction should be more of a series of observation and guidance with changing approaches as the patient's orofacial complex develops. The main advantages for the patient are related to the self-esteem of children who see their teeth aligned at an early age, to the possibility to better influence growth, to an early correction of the malocclusion with a better patient's compliance and a reduced treatment time, and to having better results with the periodontal condition of teeth erupting spontaneously in the center of the alveolar ridge.
Conclusions: Selection is very important for the success of serial extraction, although no exact method exists. There are many factors to be considered that help in taking a decision. Timing of the various steps is very important.

Two clinical cases are reported as an example.

Theme: Implantology: Oral Medicine

PD008
bFGF Upregulates the Expression of NGFR in PC12 Cells
Michiharu Shimosaka[1], Yoshitsugu Ishikawa[1], Ujjal K. Bhawal[2], Yoshimitsu Abiko[2], Koh Shibutani[1]
[1]Department of Anesthesiology, Nihon University School of Dentistry at Matsudo, Japan, [2]Department of Biochemistry and Molecular Biology, Nihon University School of Dentistry at Matsudo, Japan

Aim: The reciprocal and highly regulated processes of cellular proliferation, cellular differentiation, and progression to a postmitotic state during embryogenesis generate the cellular diversity in the developing nervous system. Growth factors, in part, can regulate these proliferative or differentiation processes by analogous mechanisms. Basic fibroblast growth factor (bFGF), a member of FGF family, has broad biological functions involving the regulation of cell growth, differentiation, and proliferation. As extension and remodeling of neurites play essential roles in development and neuronal plasticity, we investigated a role for nerve growth factor receptor (NGFR) on bFGF-induced neurite outgrowth in PC12 cells. Our goal in the present study was to determine if there is a causal link between bFGF and NGFR.
Results: Results of these studies indicate that bFGF is required for NGFR-induced changes in morphology and transcriptional induction of the gene. We have provided convincing evidence that inhibitor of bFGF, PD173074, completely inhibited NGFR protein expression, whereas it partially blocked the NGFR protein expression in response to bFGF in PC12 cells. Another important finding of our study provides the data on the involvement of bFGF in MAPK-dependent signaling pathways and neurite outgrowth in PC12 cells, which suggests a central role of MAPK in the neuronal induction by bFGF. Taken together, these results raise the possibil-

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

ity that bFGF activates a MAPK-mediated pathway related to NGFR expression.

Poster Discussion Session 02 | B332 | 30.08.2013 | 15:30–16:30

Theme: Dental Treatment & Restorative Dentistry: Pedodontics

PD009

Oral Health Status of Children by Place of Residence

Riina Runnel[1], Eino Honkala[2], Sisko Honkala[2], Jana Olak[1], Rita Nommela[1], Mare Saag[1]
[1]*Faculty of Medicine, University of Tartu, Estonia,* [2]*Faculty of Dentistry, Kuwait University, Kuwait*

Aim: Of the study was to chart the situation of oral health in Estonia during mixed dentition.
Methods: The study was carried out in southeastern Estonia among elementary school children (average age was 8.3 year) by place of residence. The schools included in the examination were randomly chosen according to the location of the school and the number of pupils (n = 485, 10% of all pupils in this area at this age). All teeth were observed and registered by ICDAS code and converted to DMFT index. The social background and the level of fluorides in drinking water vary in the area of the study. Both of them were considered in data analyze.
Results: The mean DMFT index was 0.97 and DMFS 1.62 in permanent dentition; the same numbers in mixed dentition were accordingly 5.93 and 11.86. Children residing in rural areas (presumably in families with lower income) and studying in smaller schools had a higher number of caries lesions and a lower number of fillings in the permanent dentition. There was no statistically significant difference between the groups in the mixed dentition. Analyzing the data by the level of fluorides in drinking water, the only difference was detected in the occurrence of caries lesions.
Conclusions: The difference in caries indices in mixed dentition by place of residence in Estonia was smaller than expected. Variation calculated by the fluoride level of drinking water reflected statistically only in the number of caries lesions. Reasons of the non-expected difference required further researches.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

PD010

Prosthetic Rehabilitation of a Maxillo-Mandibular Gunshot Defect: Clinical Report

Demet Çağıl Ayvalıoğlu[1], Bilge Gökçen Röhlig[1], Belir Atalay[2]
[1]*Department of Prosthodontics, Istanbul University, Turkey,* [2]*Department of Oral Surgery, Istanbul University, Turkey*

Aim: The use of dental implant is a predictable treatment option for both partially and complete edentulism, as well as maxillofacial defects. Defects either congenital or acquired by trauma or tumor resection can result in significant aesthetic deformities and functional disorders which may result in psychological sequelae. The incapacitating nature of the defect makes reconstruction of maxilla and mandible challenging. Extensive soft and hard tissue loss usually requires an implant-supported or retained prosthesis to obtain adequate facial support and restoration of oral functions. The purpose of this case report is to present prosthetic rehabilitation of a patient with mandibular and maxillary gunshot defect.
Case: The patient was rehabilitated using implant supported fixed partial dentures, tooth supported fixed partial dentures and removable partial dentures. Despite limited mouth opening and anatomical deficiencies, the patient's aesthetic and functional demands were fulfilled.

Theme: Preventive Dentistry: Caries

PD011

Caries Assessment in Young Children Using WHO and ICDAS-II Criteria

Anastasia Sergeevna Rodionova, Natalia Kuyumdzhidi, Victoria Naumova, Svetlana Derevyanchenko, Elena Efimovna Maslak
Volgograd State Medical University, Volvograd, Russia

Aim: To compare the results of caries assessment by ICDAS-II and WHO criteria in young children.
Methods: The study was approved by Volgograd Regional Ethic Committee. Cross-sectional investigation was conducted in Volgograd Pediatric Clinic No 15 in 2010, 596 well-child visitors were enrolled: 288 aged 4–11 months (G1), 220 aged 12–23 months (G2), 88 aged 24–35 months (G3), mean age 9.4 months, 15.5 months and 27.6 months respectively. Informed mothers' consents were obtained. The caries status was assessed by WHO and ICDAS-II criteria. Statistical analysis was performed by STATISTICA-6, caries prevalence, indexes mean score and 95% confidence interval (CI) were calculated.
Results: According to WHO-criteria caries free were 100% children in G1, 96.4% in G2, and 75.0% in G3, dmfs index was 0.21 (CI 0.02–0.44) and 1.59 (CI 0.99–2.19) in G2 and G3 respectively. According to ICDAS-II criteria caries free were 97.2% children in G1, 94.1% in G2 and 70.5% in G3, ICDAS-II score 1–2 was revealed in 2.8% (CI 1.83–3.77) children in G1, 4.6% (CI 3.19–6.01) in G2, 22.8% (CI 18.33–27.27) in G3, score 3–6 was only revealed in 1.3% (CI 0.54–2.06) children in G2 and 6.7% (CI 4.04–9.37) in G3. Number of children needed treatment was 2.9% to 4.5% higher according to ICDAS-II criteria compared with WHO criteria.
Conclusions: The caries status assessment by ICDAS-II criteria revealed more carious lesions in young children than assessment by WHO criteria; the assessment caries on noncavitated level by ICDAS-II may assist practitioners to promote comprehensive treatment plan for young children.

Theme: Preventive Dentistry: Caries

PD012

Effect of Prophylactic Applications on Enamel Demineralization During Orthodontic Treatment

Hande Şar Sancaklı[1], Ugur Erdemir[1], Evren Öztaş[2], Sevda Özel[3], Müyesser Saraç[2], Taner Yücel[1], Esra Yıldız[1]
[1]*Department of Operative Dentistry, Istanbul University Faculty of Dentistry, Istanbul, Turkey,* [2]*Department of Orthodontics, Istanbul University Faculty of Dentistry, Istanbul, Turkey,* [3]*Department of Biostatistics and Medical Informatics, Istanbul University Faculty of Medicine, Istanbul, Turkey*

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: To investigate the caries inhibitory effect of fluoride containing varnish(F), flouride/ tricalciumphosphate containing varnish (FTCP), chlorhexidine containing varnish (CHX) on enamel surfaces subjected to fixed orthodontic appliances when assessed by laser fluorescence (LF).
Material-method: 408 teeth in 17 patients (aged 14–22) wearing fixed orthodontic appliances are included in the study. Split-mouth design was used for each patient (1 quadrant/each application); Group1:Fluoride varnish(FluorProtector); Group2;F/TCP varnish (Clinpro TCP Varnish), Group3; CHX; (Cervitec Plus), Group4: no treatment(control). Each applications were performed at every 3 months during the orthodontic treatment. All patients were instructed to use a standard-fluoride containing toothpaste (1450 ppm NaF) and informed about their basic oral hygene routines. Bracket-bonded buccal enamel surfaces were measured at the four surrounding side by laser fluoresence device; DIAGNOdent (Kavo) by two calibrated examiners at the baseline, 3.6–12 months and after 24 months. The mean reading value was calculated for each tooth and the LF changes between the time intervals were evaluated. LF changes between the groups were analyzed by Friedman Variance Analyzis Test while Kruskal Vallis test revealed the changes due to time intervals.
Results: LF readings increased with time in all groups especially in the control and CHX group when compared to F and FTCP ($p < 0.001$). Both F and FTCP group showed less LF difference in treatment duration ($p \geq 0.05$) except when compared between baseline and 24-months ($p < 0.001$). The findings of this in vivo study indicated that fluoride containing varnishes are recommended during the fixed orthodontic treatments to inhibit the enamel demineralization assessed by LF.

Theme: Preventive Dentistry: Public Health

PD013
Work Engagement Among Dutch Dental Hygienists
Yvonne Buunk-Werkhoven[1], Vanessa Hollaar[2], Corrie Jongbloed Zoet[3]
[1]SPOH ARTS, Amsterdam, The Netherlands/Dutch Dental Hygienists' Association, Nieuwegein, The Netherlands, [2]Education of Dental Hygiene, HAN University of Applied Sciences, Nijmegen, The Netherlands/Dutch Dental Hygienists' Association, Nieuwegein, The Netherlands, [3]Dutch Dental Hygienists' Association, Nieuwegein, The Netherlands

Objectives: The aim of this study was to investigate the level of work engagement among Dutch dental hygienists.
Methods: Fifteen hundred and twenty questionnaires were randomly administrated to members of the Dutch Dental Hygienists' Association (Nederlandse Vereniging van Mondhygiënisten; NVM). The questionnaire consisted of the short form Utrecht Work Engagement Scale (UWES-9): a hypothesized three-factor structure of work engagement (Vigor, Dedication and Absorption). Statements about how one feels at work were answered on 7-point rating scales (0 = never to 6 = always).
Results: A convenient sample of 490 dental hygienists (32%), with a mean age of 38.2 years (SD = 10.1) responded and a level of work engagement of 4.77 (SD = 0.90) was found. They had a mean score on the dimensions Vigor of 4.74 (SD = 0.74), Dedication 5.08 (SD = 0.89), Absorption 4.48 (SD = 1.12). A significant correlation of the subscale Absorption with mean age was found ($r = -0.11$, $p < 0.05$).
Conclusions: Dutch dental hygienists reported a (very) high level of work engagement. A lot of dental hygienists experienced at least once a week to daily a high level of well-being at their work. Just a very small amount of the dental hygienists reported to experience (very) low level of well-being at their work. On work engagement and on the three dimensions, dental hygienists reported not only extremely higher mean scores compared with the manual norms, based upon a variety of professions, but also in comparison with the mean scores among Dutch dentists.

Theme: Preventive Dentistry: Public Health

PD014
Evaluation of an Oral Health Improvement Programme in a Prison Setting
Chuen Albert Yeung[1], Tahira Akbar[2], Stephen Turner[2], Markus Themessl-Huber[2], Stephanie Campbell[1], Celia Watt[1], James Duffy[1], Gillian Lindsay[1], Paul O'Neill[1], Derek Richards[3], Ruth Freeman[2]
[1]NHS Lanarkshire, United Kingdom, [2]Dental Health Services Research Unit, University of Dundee, United Kingdom, [3]South East Scotland and Tayside Dental Public Health Managed Clinical Network, United Kingdom

Aim: To evaluate the effectiveness of a three-year oral health improvement programme which was designed using a whole settings approach to improve the oral health of prisoners, their families and prison staff in a local prison in Lanarkshire, Scotland.
Methods: A controlled questionnaire-based survey was used to measure the oral health knowledge, attitudes and behaviours of two groups of prisoners, including intervention and control groups. Focus groups were carried out among selected prisoners and prison staff. Interviews were also conducted among prison staff and stakeholders to investigate the process, challenges and sustainability.
Results: A total of 107 prisoner questionnaires were completed. The intervention group consisted of 58 prisoners while the control group had 49 prisoners. The intervention group showed statistically significant differences in oral health knowledge and attitudes compared with the control group. However, there was no statistically significant difference in oral health behaviours between these two groups. A convenience sample of 14 prisoners and 20 staff participated in focus groups. Qualitative data suggested improvement in the oral health knowledge and behaviours of the prisoners, but little change in environment, culture and policy for the whole prison. Other initiatives such as father-child activities were assessed as having worked well. Eight stakeholders were interviewed and completed the Nuffield Partnership Assessment Tool. Scores indicated that partners were working well together.
Conclusions: The three-year oral health improvement programme was successful in improving oral health knowledge and attitudes of prisoners, but change in behaviours was only indicated in qualitative data.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Theme: Preventive Dentistry: Orthodontics

PD015

Comparison of Arch width Dimensions Among class I and class II div 1 Malocclusion Groups

Hasan Mehdi Zaidi, Ambreen Thobani, Babur Ashraf, Syed M. Faizan, Arif Pyarali Suleman
Department of Orthodontics, Fatima Jinnah Dental College, Karachi, Pakistan

Objective: The aim of this study is to 1) compare the arch width dimensions in adults with normal occlusion to those with Class II Division 1 malocclusion. 2) Compare and calculate the maxillary and mandibular arch width difference in both groups.
Methodology: A cross- sectional study conducted at Alvi Dental Hospital & Fatima Jinnah Dental College. A total of 100 Class I subjects (43 males, 57 females) and 85 Class II division 1 (43 males, 42 females) patients, from 13–24 years were selected having all permanent teeth erupted from 1st molar to 1st molar. There was no history of previous orthodontic treatment. Patients with syndromes or grossly carious teeth and posterior crossbites were excluded.
Results: Mean maxillary intermolar, intercanine & interalveolar width for Class I group was 51.6 mm, 34.2 mm, 59.5 mm and for Class II division 1 it was 49.2 mm, 32.5 mm and 57.2 mm, respectively. Mean mandibular intermolar, intercanine & interalveolar width for Class I group was 50.4 mm, 26.4 mm and 55.8 mm and for Class II division 1 it was 50.3 mm, 26.3 mm and 55.4 mm, respectively. Mean intermolar width difference was 1.2 mm for Class I and −1.0 for Class II group.
Conclusions: Maxillary dental arch is narrower in Pakistani adults with Class II Division 1 malocclusion, as intermolar, intercanine and interalveolar dimensions were significantly smaller than Class I sample. Males of both the groups had larger arch width dimensions than the females. Arch width difference was negative for Class II group indicating posterior crossbite tendency.

POSTERS SESSION 03 (P419–P627)

Theme: Dental Treatment & Restorative Dentistry: Caries

P419

Prevalence of Talon Cusp in a Turkish Sub-population

Emre Özel[1], Enver Alper Sinanoğlu[2]
[1]*Department of Operative Dentistry, University of Kocaeli, Kocaeli, Turkey,* [2]*Department of Oral and Maxillofacial Radiology, University of Kocaeli, Kocaeli, Turkey*

Purpose: The aim of this study was to investigate the prevalence of talon cusps on permanent teeth in a Turkish population and their distribution among different type of teeth.
Materials and methods: Clinical and radiographical examination of 8388 Turkish subjects (4731 female, 3657 male) were conducted to determine the talon cusp on permanent teeth. All cases were evaluated in accordance to the classification by Hattab et al. The records and radiographs of the patients with talon cusps were evaluated in terms of age, gender, location, affected tooth, talon type and treatment procedure. Statistical analysis was performed by using Chi-square test ($p < 0.05$).
Results: Thirty-one patients presented talon cusps with a total number of 59 teeth. 22 talon cusps were classified as trace-talon (37.29%), 30 were semi-talon (50.85%) and the remaining 7 were true-talon (11.86%).
Conclusion: The prevalence of talon teeth were found to be 0.36% on permanent teeth in a sub-population of Turkish adults.

P420

Influence of Cavity Design on Cuspal Deflection in Maxillary Premolar

Ivana Kantardzic[1], Darko Vasiljevic[2], Larisa Blazic[1], Tatjana Vukadinov[1]
[1]*Department of Restorative Dentistry and Endodontics, School Of Dentistry, Faculty of Medicine, University of Novi Sad, Novi Sad, Serbia,* [2]*Institute of Physics, University of Belgrade, Belgrade, Serbia*

Aim: To investigate the influence of cavity design on cuspal deflection in maxillary premolar using finite element analysis.
Materials and methods: Three-dimensional models of maxillary premolar with three cavity preparation designs: mesio-occlusal-distal cavity, mesio-occlusal-distal cavity with 2.0 mm palatal cusp reduction and mesio-occlusal-distal cavity with 2.0 mm buccal and palatal cusp reduction, were generated using SolidWorks 2011 software. All cavities were simulated to be restored with direct resin composite restoration. Static axial load with the resulting force of 200 N was applied on the occlusal surface of a tooth at the palatal cusp tip and both marginal ridges, simulating maxillary premolar in the maximum intercuspal position.The same software was used for finite element analysis. Cuspal deflection values were calculated and recorded for the models.
Results: Performed numerical simulations showed no differences in cuspal deflection among tested models.
Conclusions: This study showed no influence of cavity preparation design on cuspal deflection, suggesting that in maxillary premolar with mesio-occlusal-distal cavity cuspal reduction has no advantage.

Theme: Dental Treatment & Restorative Dentistry: Endodontics

P421

Comparison of Various Smear Layer Removal Techniques on push-out Bond Strength of MTA Fillapex

Esma Ozeroglu[1], Betül Ozçopur[1], Sıddık Keskin[2]
[1]*1Department of Endodontics, YuzuncuYil Univercity Faculty of Dentistry, Van, Turkey,* [2]*Biostatistics, YuzuncuYil Univercity Faculty of Dentistry, Van, Turkey*

Introduction: The purpose of this study was to compare the smear layer removal efficacy of EDTA, chitosan, Er, Cr: YSGG laser or

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

ultrasonic irrigation regimes on push-out bond strenght of MTA fillapex.
Methodology: Twenty extracted single-rooted human teeth were randomly divided into four groups (n = 5). During preparation, after each file size root canals were irrigated with 1% NaOCl. Final irrigation regimes were used respectively; Group 1, 3 ml 17% EDTA for 3 min; Group 2, 3 ml 2% Chitosan for 3 min; Group 3, saline for 1 min with ultrasonics; Group 4, saline for 1 min with Er, Cr: YSGG laser (Biolase Technology, Inc, San Clement, CA). Then the canal spaces were filled with MTA fillapex (Angelus, VDW) using single cone technique. After incubation for one week, roots were sectioned into 1 mm thickness and dislodgement resistance of the samples were measured using a universal testing machine at a crosshead speed of 0.5 mm/min. Data were analyzed using Kruskall-Wallis test ($p = 0.05$).
Results: Statistical analysis showed no significant difference between the push-out bond strength of the tested groups. ($p > 0.05$)
Conclusions: Under the present in vitro conditions; using either of the EDTA, chitosan, ultrasonics or Er, Cr: YSGG laser for final irrigation may be considered as an alternative to each other.

P422
Evaluation of Surface Characteristics of Rotary Nickel-Titanium Instruments Produced by Different Manufacturing Methods
Uğur İnan, Melek Gürel
Department of Endodontics, Ondokuz Mayıs University, Samsun, Turkey

Aim: The purpose of this study was to investigate the surface quality of new and used rotary NiTi instruments manufactured by traditional grinding process and twisting methods.
Materials and methods: In this study, a total of 8 TF (SybronEndo, Orange, CA, USA) and 8 Mtwo (VDW, Munich, Germany) instruments were evaluated. Size 25.06 of four new TF and four Mtwo instruments were collected for the study. Also 4 sets of TF and Mtwo instruments were used to shape mandibular first molar teeth of two patients in routine clinical use. Used and new files were attached to metal holders with double sided tape and each sample was placed on the AFM and analyzed on three points along a 3-mm section at the tip of the file. Three dimensional AFM images were processed with Nanoscope 6.13 software and quantitative measurements according to topographic deviations (root mean square (RMS)) were collected. The data were statistically analyzed with paired samples t- test and independent samples t test.
Results: Mean RMS values for new and used TF 25.06 files were 10.70 ± 2.80 nm and 21.58 ± 6.42 nm, and mean RMS values for new and used Mtwo 25.06 files were 24.16 ± 9.30 nm and 39.15 ± 16.20 nm respectively; the difference between them was statistically significant ($p < 0.05$).
Conclusion: According to the RMS values, new TF 25.06 files had better surface quality than the new Mtwo 25.06 files and used Mtwo 25.06 files showed more deterioration than the used TF 25.06 files.

P423
Effect of MTAD and Er:YAG Laser on Smear Layer Removal: An SEM Evaluation
Figen Eren Giray[1], Işıl Kalyoncu[1], Başak Durmuş[1], Yıldız Garip Berker[2], İlknur Tanboga[1]
[1]*Department of Pediatric Dentistry, School of Dentistry, Marmara University, Istanbul, Turkey,* [2]*Department of Endodontics, School of Dentistry, Marmara University, Istanbul, Turkey*

Introduction and Aim: Various organic acids, instruments and lasers have been used to remove the smear layer from the surface of instrumented root canals. The aim of this study was to determine the effectiveness of MTAD (a mixture of a tetracycline isomer, an acid, and a detergent) and Er:YAG laser to remove the smear layer, and compared with that of 17% EDTA and 5.25% NaOCl.
Materials and methods: Twenty-eight extracted maxillary and mandibular incisors were prepared with ProTaper Universal rotary files. Following each file use, the root canals were irrigated with 5.25% NaOCl. The teeth were randomly allocated to four treatment groups; (1)17% EDTA (control group), (2) 5.25% NaOCl, (3) Er:YAG laser and (4) MTAD. All teeth were processed for scanning electron microscopy (SEM) and the removal of the smear layer was examined in the apical, middle and coronal thirds. Analyses of SEM images were performed using a four grade scale.
Results: There was a significant difference between the groups ($p < 0.0001$). The middle and coronal thirds of the root canals in MTAD group showed lower average scores than those in groups EDTA/ Er:YAG laser. In the apical, middle and coronal thirds of the root canal there was no significant difference between the EDTA and Er:YAG laser groups.
Conclusions: MTAD removes most of the smear layer when used as an intracanal irrigant.

P424
Comparison of Four Electronic Apex Locators to Determine The Major Foramen
Demet Altunbaş[1], Alper Kuştarcı[2], Dilara Arslan[3]
[1]*Department of Endodontics, Cumhuriyet University, Sivas, Turkey,* [2]*Department of Endodontics, Akdeniz University, Antalya, Turkey,* [3]*Department of Endodontics, Bezmialem University, Istanbul, Turkey*

Aim: To evaluate in vitro the accuracy of four electronic apex locators, Dentaport ZX, Raypex 5, Endomaster and VDW.Gold in detecting the major foramen using the clearing technique.
Methodology: Forty-eight extracted human single-rooted teeth with mature apices were used for the study and divided into four groups of 12 teeth. All teeth were embedded in an alginate model. The electronic measurements were taken following the manufacturers' orientations using a #15 K-file attached to the holder. Then the teeth were cleared and photographed under a stereomicroscope with a digital camera. The distance between the tip of the file and the major foramen was measured by using image analysis software programme. Positive and negative values were recorded when the file tip was beyond or short of the major foramen and zero value when the file tip and the major foramen coincided. Statistical

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

analysis were performed using the Kruskal-wallis and chi-squared test at a significance level of 0.05.
Results: The mean distance between the file tip and the major foramen were 0.302, 0.065, 0.117, 0.258 mm in the Dentaport ZX, Raypex 5, Endomaster and VDW.Gold groups, respectively, with no statistically significant differences ($p > 0.05$).
Conclusion: Under the in vitro conditions of this study, all electronic apex locators showed an acceptable determination of the major foramen.

P425

The Quality of Different Preparation and Root Canal Filling Techniques in Curved Root Canals

Neslihan Şimşek[1], Fuat Ahmetoglu[1], Levent Akıncı[1], Arife Kapdan[2]
[1]*Department of Endodontics, Inonu University, Malatya, Turkey.*, [2]*Department of Pedodontics, Cumhuriyet University, Sivas, Turkey.*

Aim: The aim of this study was to evaluate the quality of different root canal filling techniques such as lateral compaction and thermoplasticized injectable gutta percha in curved root canals which were prepared Revo-S (Micro-Mega, Besançon, France) or self-adjusting file (SAF; ReDent-Nova, Ra'anana, Israel) using digital radiographs.
Material-methods: Curved root canals of 40 extracted mandibular molar teeth were prepared using SAF or Revo-S instruments. After determination of root canal curvatures and radii in two directions, the canals were divided two subgroups ($n = 20$, $p > 0.05$). Both mesiobuccal and mesiolingual canals were shaped and filled with AH Plus and either cold lateral compaction technique or high-temperature thermoplasticized injectable gutta percha obturation technique. The specimens were stored for 1 week at 370 C and 100% humidity to allow the complete setting of the sealer. Postoperative digital radiographs were taken to evaluate the quality of root canal fillings using a modified scoring system originally suggested by Kersten et al (1). Data were analyzed using Mann-Whitney tests.
Results: All groups exhibited similar root curvature ($p > 0.05$). In terms of the preparation techniques, no significant differences were found between the root canal filling techniques ($p = 0.051$, $p = 0.127$).
Conclusions: Under the conditions of the present study, neither preparation nor obturation techniques did not affect the quality of root canal filling in curved root canals.
References: 1. Kersten HW, Wesselink PR, Thoden van Velzen SK. The diagnostic reliability of the buccal radiograph after root canal filling. Int Endod J 1987; 20: 20–4.

P426

Comparing Time Spending between when Masseren kit, Ultrasonic and CFS using for Retrieving Broken File

Can Şivet
Department of Endodontics, Marmara University, Istanbul, Turkey

Introduction: There have been many different devices developed to retrieve fractured instruments during endodontic procedures. The file removal process becomes even more difficult when breakage occurs in the apical third of the canal. When an attempt to bypass such a fragment becomes difficult, it should be retrieved by mechanical devices. Variations in success rates have been reported according to devices used for removal of separated instruments.The purpose of this study is to compare the duration of use of the devices which were successful in retrieving of the seperated endodontic file from the root canal.
Methods: In this study 60 mandibular first premolar teeth were used. Rotary notched instruments were run at different pressures with a high-torque handpiece to break the instruments and impact them to apical 1/3 level of the canal walls. Attempts were made to visualize all fractured instruments under a dental loop after creating a straight-line access to the fragment. Broken instruments were removed with ultrasonic, Maseren Kit and Canal Finder System and successful time spending results were recorded.
Results: In the Ultrasonic group, the overall success time was 211 s in the Masseren Kit's it was 91 s in the Canal Finder system's it was 252 s and in the Bypass's it was 287 s Success time were significantly higher when attemp to bypass fractured file.
Conclusions: Maseren Kit used in this study for fractured instruments were effective, and three times greater success time was obtained. Bypassing fractured fragment in the apical 1/3 is more difficult and time spent than other methods.

P427

Fatigue and Fracture Resistance of Devitalized Teeth: Finite Element Analysis

Ksenija Zelic Mihajlovic[1], Arso Vukicevic[2], Nenad Filipovic[3], Gordana Jovicic[2], Obrad Zelic[4], Marija Djuric[1]
[1]*Laboratory for Anthropology, Institute of Anatomy, School of Medicine, University of Belgrade, Belgrade, Serbia,* [2]*Faculty of Engineering, University of Kragujevac, Kragujevac, Serbia,* [3]*Bioengineering Research and Development Center Kragujevac, Kragujevac, Serbia,* [4]*Clinic for Periodontology and Oral Medicine, School of Dentistry, University of Belgrade, Belgrade, Serbia*

Aim: This study represents a part of major project investigating the phenomenon of increased fragility of devitalized teeth. The Finite-Element-Method is used to analyze fracture resistance and fatigue behavior of dental tissues in various phases of root-canal-treatment.
Materials and methods: Two intact upper premolars of the same patient with very similar external and root canal morphology were used. One tooth remained intact while the other one underwent root canal enlargement up to the size of 0.40 mm at the physiological apex, with 0.1 mm increment every 1 mm coronally. It was restored with mesio-occlusal Class II composite filling. Both teeth were scanned and used to create 4 FEA models: intact tooth, tooth with mesio-occlusal Class II composite restorations and two models with root-canal-treatment representing initial and final enlargement of the canal. Critical breaking axial force was determined by compression test. Material characteristics were taken from the literature. Mechanical performance of dental tissues were analyzed using Finite-Element-Method.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Results: Comparing with intact tooth, premolar with Class II restoration had reduced strength for about 20% and could survive 11% less cycles during cyclic load. Devitalizated tooth with initial root canal enlargement showed greater reduction of strength (28%) and number of survived cycles was decreased for 33% in fatigue testing. The canal spreading up to final enlargement had small additional influence on tooth resistance both on critical force and on cycling load.
Conclusion: Our results elucidate the influence of changes in tooth geometry during root-canal-treatment and crown restoration on increased fragility of devitalized teeth.

P428

Treatment of Horizontal Root-Fractured Maxillary incisors – Two Case Reports

Neslihan Büşra Özerol, Uğur İnan
Department of Endodontics, Ondokuzmayıs University, Samsun, Turkey

Aim: To describe a conservative approach in the treatment of horizontal root-fractures and their one-year follow up.
Case: Management of root fractures depend on the extent of the fracture line, the pulp situation, occlusion, dislocation of fragments and the general health of the patient.

Case 1: A 33 year-old male patient was referred to our clinic with the complaint of root fracture two months after a traffic accident. Diagnosis of root fracture on maxillary central incisor was accomplished by clinical and radiographic examination. Pain was observed in horizontal and vertical percussion tests, and also mobility was observed. Coronal part of root fracture did not respond to electrical pulp testing. Radiographic examination revealed healing with interposition of soft tissue and presence of radiolucency. The treatment plan comprised of splinting the coronal fragments and using calcium hydroxide as an intracanal medicament. Then 1 week later, root canal therapy was perfomed to coronal part of the root.

Case 2: A 30 years-old female was referred to our clinic as a result of fracture of maxillary right central insicor, occurred 2 days ago. At radiographic examination horizontal root fracture was determined. Pain to palpation, percussion of teeth, normal mobility and positive response of pulp testing was determined in clinical examination. Endodontic therapy was performed and calcium hydroxide was applied at first visit. 1 week later, root canal obturation of both coronal and apical parts was completed.
Results: At one-year follow up, the teeth were asymptomatic, and clinical and radiographic examinations revealed healing patterns.

P429

Effects of Frequency Alterations of ND:YAG Laser Applications on the Adhesion of Epiphany

Umut Tunga, Elif Kalyoncuoğlu, Şenay Kaya, Murat Kurt, Tuğrul Kırtıloğlu
Department of Endodontics, Ondokuzmayıs University, Samsun, Turkey

Objectives: To evaluate the adhesion of a resin-based sealer to human dentine irradiated with Nd:YAG laser at two different frequency parameters, using the push-out test.
Study design: Fourty eight maxillary anterior teeth were instrumented using crown-down technique. After each instrument, the root canals were irrigated with 5 ml 2.5% NaOCl. Specimens were divided into four groups (n:12): Group C (control group), No was performed to the specimens. Group 1, dentine was treated with 2 ml of 17% EDTA for 5 min. Group 2 and 3, dentine were irradiated with Nd:YAG laser at 10 Hz and 15 Hz, respectively. The root canals were then filled with Epiphany SE-Resilon. The roots were sectioned 4 mm below the cemento-enamel junction to provide 4 mm thick dentine discs which were centered inside aluminum discs and embedded in acrylic resin and submitted to a push-out test.
Results: Statistically significant differences were found among the groups. Group 3 showed significantly higher bond strength than the other groups ($p < 0.05$). Group 2 showed the lowest adhesion values ($p < 0.05$).
Conclusion: An increase in laser frequency increased the adhesion of the Epiphany sealer to dentine walls.

P430

Dentin Pulp Complex Regeneration and Laser phototherapy

Márcia Martins Marques[1], Maria Stella Moreira[1], Rejane AndradeDe Carvalho[2], Ivana Márcia Diniz[1], Fernanda Campos Almeida Souza[1], Itamara Lucia Itagiba Neves[3], Giulio Gavini[1]
[1]Department of Restorative Dentistry, University of Sao Paulo, Sao Paulo, Brazil, [2]Department of Endodontics, University of Rio Grande do Norte, Rio Grande do Norte, Brazil, [3]Department of Dentistry at Heart Institute InCor, University of São Paulo

Aim and propose: Laser Phototherapy (LPT) is able to improve cell migration, thus could be useful for promoting homing of periapical stem cells into dental root canals. The aim was to analyze the influence of LPT on the root dental pulp regeneration in rat molars.
Materials and methods: The dental pulp tissues of twenty molar roots of rats were extirpated. Then, the root canals were endodontic treated and filled with blood clot from hemorrhage provoked at the periapical tissue. These roots were randomly divided into two groups, as follows: Lased and non-Lased. The LPT was done using a diode laser (660 nm; 20 mW, 0.028 cm, 5 J/cm², 7 s, 14 J per point) using punctual technique. The crowns of the molars were restored with glass ionomer. Thirty days later the teeth were histologically analyzed.
Results: Seventeen out of the 20 dental roots were retrieved for histological analyses. Partial or total filling content was observed inside the root canals in both groups. In some cases this content was interpreted as newly formed connective tissue that underwent to necrosis (53%), whereas in others remnants of infected blood clots (35%) were present, where contamination occurred due to crown breakdown or restoration loss. In two cases (12%) of the lased group newly formed connective tissue was observed. In one these cases complete dental pulp tissue included an odontoblast-like layer.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Conclusion: It is possible to achieve dental pulp regeneration from blood clot inside the root canal by LPT stimulation. This could probably be outcome of periapical stem cell homing.

P431

Effect of Tooth Localization on Dimensional Changes of Pulp Chamber in Renal Patients

Dina Erdilek[1], Yasemin Benderli[1], Tamer Erdem[2], Kağan Gökçe[3], Elif Defne Tacettinoğlu[4], Rian Dişçi[5], Selmin Kaan Aşçı[4]
[1]Deparment of Restorative, Faculty of Dentistry, Istanbul University, Istanbul, Turkey, [2]Deparment of Radiologic, Faculty of Dentistry, Istanbul University, Istanbul, Turkey, [3]Deparment of Restorative, Faculty of Dentistry, Yeditepe University, Istanbul, Turkey, [4]Deparment of Endodontics, Faculty of Dentistry, Istanbul University, Istanbul, Turkey, [5]Department of Public Health, Faculty of Medicine, Istanbul University, Istanbul, Turkey

Objective: The aim of this study was to evaluate the effect of maxillar or mandibular localization of the teeth on dimensional changes of pulp chambers in hemodialysis and transplanted patients.
Materials and methods: Forty-four patients (aged 20–50 years) with chronic renal disease over one year were examined due to their maxillar or mandibular localization and dimensional measurements of the pulp chambers were performed. Full-mouth periapical radiographs of all of the patients were taken and images were adapted to a software programme where outer lines of images of the teeth were determined and drawn digitally. The inner areas and the outer lines of pulp chambers were measured automatically. Ratios of the pulp areas to tooth areas were calculated for each tooth and the findings were evaluated statistically by ANOVA test.
Results: Comparison of dimensional changes of the pulp chambers of renal patients with those of healty individuals on both the maxillar and mandibular tooth localizations showed that, pulp chambers of renal patients were significantly smaller than those of the controls' ($p < 0.001$). The difference of the tooth localization on upper or lower jaws, has also a significant effect on dimensional changes of the pulp chambers.
Conclusion: Considering of the effect of maxillar or mandibular localization of the teeth on dimensional changes of the pulp chambers in hemodialysis and transplanted patients, it was shown that tooth localization on different jaws could be effective for the amount of abnormal mineralization in pulp chambers.

P432

The Influence of 17%EDTA and 10%citric Acid on Root Canal Dentin in Combination with 2.5% Sodium Hypohlorite

Ilijana Muratovska[1], Aneta Atanasovska Stojanovska[2], Arijan Daci[2], Vanco Spirov[3], Vera Stojanovska[1]
[1]Department of Cariology and Endodontics, Skopje, Macedonia, [2]Department of Periodontology, Skopje, Macedonia, [3]Department of Oral Surgery, Skopje, Macedonia

Aim: The objective of the present study was to evaluate the capacity of chelators 17%EDTA and 10%citric acid used in root canal alone or combined with 2.5% sodium hypochlorite to remove calcium ions from root canal dentin and quantify the extracted calcium ions released during root canal therapy by atomic spectrophotometry absorbance.
Material-methods: Total 40 pieces of dentin were analyzed. Dentin samples were immersed in reagents (about 2–3 ml) and left in for 15 min. After the expiration of the time they, were washed out and put on chemical watch glasses to dry at room temperature for 2–3 h. Then teeth were crushed to fine powder in mortar with pestle. Crushed tooth samples scales 0, 05 g (to the nearest 0, 0001 g) in glass vials to which is added 1 ml HNO3, 1 ml H2O2 and 1 ml HCl. Then the glasses are placed on the hot plate and heat until crashed teeth get disoluted. Solutions obtained by the thermal decomposition of the teeth quantitatively transmitted measures in small botles of 50 ml. Measured samples complement redestilized water to marked.
Results: In the study results shows the effect of chelating solutions on a Calcium ration in root dentine with statistically significant changes ($p < 0.05$) in short term application of combined irritant solutions of 17%EDTA and 10%citric acid with with 2.5% sodium hypohlorite.
Conclusion: The conclusion is based on findings that 2, 5%sodium hypochlorite removes the organic parts of the smear layer leaving the dentin substrate to the action of the chelators as preferred combination.

P433

A Conservative Approach for Complicated Crown-Root Fracture: A Case Report

Makbule Bilge Akbulut, Ayce Unverdi Eldeniz
Department of Endodontics, Selcuk University, Konya, Turkey

Introduction: Dental traumatic injuries are highly prevalent among children and adolescents. Crown-root fractures of anterior teeth present difficulties for restoration. This case report describes the treatment of a complicated crown-root fracture of maxillary right lateral incisor with extensive loss of tooth structure and uncomplicated crown fracture of maxillary right central incisor in a young adult.
Case: The 15-year-old male patient was presented to Endodontic clinic with post-traumatic injury. After the mobile crown-root fragment of lateral incisor was removed, root canal therapy was performed in two visits. Calcium hydroxide was used as an intracanal dressing. Root canal filling, glass fiber post cementation and adhesive tooth fragment reattachment were performed. Central incisor was restored with composite restoration. Early stage success was achieved with the observance of good functional and aesthetic outcomes. However the patient did not attend follow-up visits and returned after 14 months with secondary trauma which resulted fracture of the reattached part and minor fractures extending to middle root so the tooth was extracted.
Conclusion: As it is crucial to retain the tooth to maintain space and to protect alveolar bone height, clinicians should always consider trying reattachment of tooth fragments. The case presented here is sufficient and effective in postponing fixed prosthetic restorations or implant treatments.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P434

Is it Possible to Reduce File Numbers of the Conventional Rotary Systems?

Gül Çelik Ünal[1], Murat Maden[1], Ahmet Savgat[1], Cevat Emre Erik[1], Hikmet Orhan[2]
[1]*Department of Endodontics, Faculty of Dentistry, Süleyman Demirel University,* [2]*Department of Public Health, Faculty of Medicine, Süleyman Demirel University*

Aim: To evaluate whether it is possible reduce file numbers of the conventional rotary systems and to compare with Reciproc.
Methods: A total of 45 simulated canals with 40o curvature in clear resin blocks were prepared with conventional rotary systems; ProFile orifice shaping #3 and final flaring #25/.06 (Dentsply Tulsa Dental, Tulsa, OK), Reciproc R25 (VDW, Munich, Germany), and ProTaper shapping file SX and finishing file F2 (Dentsply Maillefer, Ballaigues, Switzerland). Instruments were used one time before being replaced. Pre- and post-instrumentation views were analyzed using digital images captured by a camera. Prepared inner and outer walls at 1–10 levels was measured by using a software programme. The transportation, instrumentation time, change of working length, and instrumentation fractures were evaluated. Data were analyzed by ANOVA, Kruskal Wallis and Independent T Test ($P < 0.05$).
Results: Reciproc removed more mass in total and caused less transportation in middle and coronal third ($p < 0.05$). The transportations performed in the apical third, opposite to the curve. There was no significant difference among the groups in terms of maintaining the original working length. Reciproc was significantly faster ($p < 0.05$). Only one instrument fracture (25/0.06 ProFile) was noted. All groups showed one each ledge.
Conclusion: Within the limitations of this study, ProFile and ProTaper files have a potential for reducing the file numbers in shaping for curved root canals. However, Reciproc produced with the concept of a single file, was determined that more advantageous in terms of time and shaping ability.

P435

Can An Avulsed Tooth Survive Without A dentist? – a case report

Anıl Teke, Ayşe Diljin Keçeci
Department of Endodontics, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey

Aim: To present an avulsed permanent maxillary central incisor, which was replanted randomly 12 years ago without any professional treatment.
Case: A healty 22-year-old male referred to the Department of Endodontics, related to ache of the tooth 11 in February 2010. In his dental history, it is informed that, he fell to the ground in the schoolyard before 12 years and the right central incisor was avulsed.

The avulsed tooth was replanted immediately by the school janitor but he did not referred to any dentist until 2010. He mentioned now and then absess formation in frontal apical area of the related tooth.

The clinical examination revealed the presence of color change, and sensitivity to percussion, but the absence of vitality, mobility or ankylosis. Radiographic examination showed the presence of inflammatory external root resorption and an extensive apical lesion. A nonsurgical root canal treatment was performed in two visits. Then, intracoronal bleaching was performed.

Three years after treatment, recall examination revealed a normal periodontal tissue with absence of infection, mobility, ankylosis, progressive resorption or apical lesion. The tooth color had no relapse in this period.

P436

The Effect of Laser Irradiation on Root Surface: Shear-Bond Strength Study

Melek Akman[1], Kezban Çelik[1], Betül Ozcopur[2], Sema Belli[1]
[1]*Department of Endodontics, Selcuk University, Konya, Turkey,* [2]*Department of Endodontics, Yuzuncuyıl University, Van, Turkey*

Aim: To evaluate the effects of 17% EDTA or Nd:YAG laser on shear bond strength of epoxy resin based sealer AH Plus (Dentsply, De Trey, Konstanz, Germany) to root dentin.
Methodology: Twelve extracted premolars were decoronated. The roots were longitudinally sectioned using a diamond saw under water cooling to obtain two root halves from each tooth ($n = 24$). The cut surfaces were grounded with 800 grit emery paper. Three-mm high build-ups with a constant surface area of 3.45 mm^2 were created using AH Plus sealer and allowed to set (37°C, 100% humid, 72 h). The samples were tested to failure for shear bond strength (1 mm/min). The cut surfaces were re-grounded and subjected to 5.25% NaOCl for 5 min. Two subgroups were created and then treated with 17% EDTA or laser irradiation as follows: G1: 17% EDTA for 5 min G2: Nd:YAG laser (10 pps, 10 s, 1.5 W, 100 mJ and 15 Hz). Shear bond strength test was repeated for each sample. The data was calculated (MPa) and analyzed using paired samples t-test.
Results: Nd:YAG Laser treatment did not change shear-bond strength of AH Plus ($p = 0.238$). 17% EDTA treatment decreased shear bond strength of AH Plus ($p = 0.000$).
Conclusion: Nd:YAG Laser treatment did not effect shear bond strength of AH Plus to root dentin. Therefore can be used safely for disinfection of the root canal.

P437

The Effect of Acidic Environment on MTA and Bioaggregate

Melike Hüda Bayram[1], Emre Bayram[1], Hüseyin Taşkan[2]
[1]*Department of endodontics, GaziosmanpaŞa University, Tokat, Turkey,* [2]*Personal clinic, Elazığ, Tokat*

Introduction: The aim of this study was to compare the effect of acidic environment on the dislodgement resistance of mineral trioxide aggregate (MTA) and Bioaggregate (BA) (Innovative BioCeramix, Vancouver, Canada)
Methods: Eighty freshly extracted human maxillary central were used in this study. Teeth were sectioned transversally 4 mm below

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

the cemento-enamel junction to provide 4-mm-thick dentine discs that were embedded in acrylic resin. Next, the specimens were randomly assigned to two experimental groups according to the type of the root canal repair materials (n = 40). Specimens of each material were randomly divided into 4 groups (n = 10) according to storage media:, group A: butyric acid (pH = 4.4), group B: butyric acid (pH = 5.4), group C: butyric acid (pH = 6.4), group D: phosphate-buffered saline (PBS) (pH = 7.4). Dislodgment resistance was then measured using a universal testing machine.
Results: MTA and BA had the same dislodgement resistance. The dislodgment resistance of MTA and BA was significantly reduced ($p < 0.05$) after exposure to acidic environment. After rise of acidic pH, there was a statistically significant difference among groups; the MTA D group had significantly the highest bond strength, and the MTA group A had the lowest ($p < 0.05$).
Conclusions: MTA and BA is influenced by the acidic environment.

P438

Efficacy of Ibuprofen and Celecoxib in Controlling Post-Endodontic Pain

Abu Bakr Sheikh, Mahenau Afghan Janjua, Bilal Hussain Khan, Mubasshir Saleem, Usman Rehman
Department of Operative Dentistry, Fatima Jinnah Dental College, Karachi, Pakistan

Introduction: The occurrence of postoperative pain is not a rare event even when root canal treatment hasfollowed acceptable standards. Post-operative pain is almost exclusively due to the development of acute inflammation at the peri-radicular tissues in response to an increase in the intensity of injury coming from the root canal system. NSAIDs have been shown to be very effective for managing pain of inflammatory origin. For controlling post-endodontic pain COX-2 selective inhibitorscan be prescribed as they provide analgesia and anti-inflammatoryaction while avoiding adverse effects on gastrointestinal tract and other tissues related to non-selective NSAIDs.
Objective: To compare the efficacy of ibuprofen and celecoxib in controlling post-endodontic pain.
Study design: Quasi Experimental study.
Settings: Department of Operative Dentistry, FJDC
Duration: 22nd December 2006 to 29th April, 2008 (1 year 4 months)
Subject and methods: One hundred patients requiring root canal treatment and meeting the criteria of the study were equally divided into two groups, A and B. Pulpectomy was done and canals prepared till ISO #25 file reached the estimated working length. Patients in group A were administered Ibuprofen and those in group B were given Celecoxib. First dose was given preoperatively. Each patient rated their pain on a visual analog scale at initial and then 4, 8, 12, 24 and 48 h after initiation of endodontic therapy.
Results: There was no statistically significant difference in post-endodontic pain between the groups of patients taking Ibuprofen and Celecoxib.
Conclusions: Ibuprofen and Celecoxib have similar efficacy in controlling post-endodontic pain.

P439

CBCT Evaluation of Multiple Idiopathic Internal Resorptions in Permanent Molars: Case Report

Atakan Kalender[1], Meltem Dartar Öztan[2], Fatma Basmacı[1], Umut Aksoy[1], Kaan Orhan[3]
[1]Department of Endodontics, Near East University, Faculty of Dentistry, Lefkosa, Turkey, [2]Department of Endodontics, Ankara University, Faculty of Dentistry, Ankara, Turkey, [3]Department of Dentomaxillofacial Radiology, Near East University, Faculty of Dentistry, Lefkosa, Turkey

Background: Internal inflammatory root resorption is a rare condition in permanent teeth, which requires the presence of necrotic and infected pulp tissue within the coronal portion of the root canal system as well as inflamed pulp tissue apical to the resorptive defect. The aetiology of internal root resorption is not completely understandable, trauma and chronic pulpitis are considered the main risk factors.
Methods: We report a case of the multiple idiopathic resorption in the permanent maxillary and mandibular molars in a healthy 33-year-old female patient. In addition to clinical examination the patient was imaged using conventional radiography techniques and cone beam computed tomography (CBCT).
Results: The patient had recurrent throbbing pain in her #46. The radiographic examination including "panoramic radiography and CBCT" revealed that radiographic evidence of internal resorption in #36, #37, #46, #47, #26, #27, #16, #17 and also including in unerupted #17, #26, #27, #28 teeth. The definitive diagnosis was made with the histopathological examination of the extracted tooth.
Conclusions: Internal root resorption is a rare clinical process that should be examined using different radiographic modalities. CBCT seems to be useful in evaluation of the lesions with superior diagnostic performance.

P440

An in vitro Evaluation of Cytotoxic Effects of BioAggregate and Mineral Trioxide Aggregate

Esma Asuman Çavdar Tetik[1], Meltem Dartar Öztan[2], Taibe Arsoy[3]
[1]75, Yıl Dental Hospital, Ankara, Turkey, [2]Department of Endodontics, Ankara University, Ankara, Turkey, [3]Foot and Mouth Disease Institute, Ankara, Turkey

Aim: The aim of this study was to evaluate the cytotoxic effects of BioAggregate (BA) in comparison with Mineral Trioxide Aggregate (MTA) on L 929 cells.
Methodology: Fifteen discs of each material BA and MTA were prepared. Then the samples were aged for 24, 48 and 72 h in DMEM/F12. After each ageing interval, cytotoxicity of the extracts to cultured fibroblasts (L 929) was measured by MTT assay. The degree of cytotoxicity for each sample was determined according to the reference value represented by the cells with a pure culture medium. Statistical significance was determined by Kruskal-Wallis and Friedman tests.
Results: There was no statistically significant difference between BA and MTA in the rates of cell viability at 24-h evaluation. BA

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

group showed higher rate of cell viability than MTA at 48 and 72 h.
Conclusion: Both BA and MTA displayed an acceptable biocompatibility.

P441
Evaluation of Surface Quality of Rotary NiTi Instruments using SEM
Uğur İnan, Melek Gürel
Department of Endodontics, 19 Mayıs University, Samsun, Turkey

Aim: The aim of this study was to evaluate the types of defects observed on new rotary NiTi instruments using scanning electron microscopy (SEM).
Materials and methods: The study was conducted using new sets of rotary NiTi instruments of four different brands of different manufacturing methods. The instruments included were ProTaper (Dentsply Maillefer, Ballaigues, Switzerland), Mtwo (VDW, Munich, Germany), RaCe (FKG Dentaire, La Chaux-de-Fonds, Switzerland) and Twisted Files (TF) (SybronEndo, Orange CA, USA). Eleven instruments of each commercial brand were used (total = 44). The instruments were carefully removed from their original packages and analyzed with SEM (JSM 6400; JEOL, Tokyo, Japan) for the presence of defects such as irregular edge, debris, grooves, microcavities/pitting and scraping. Final 3 mm of the instruments were examined at wide range of magnifications and no type of treatment or preparation was performed. The SEM micrographs were analyzed by 2 skillful observers.
Results: All files showed defects and no instrument was free of imperfections. Major defect was presence of grooves and 100% of Mtwo and ProTaper instruments presented scratches and grooves. While RaCe instruments presented surface debris in 100% of the samples, surface debris was observed in 72.7% of ProTaper and 45.4% of Mtwo instruments. TF had the least surface debris on the instruments (18.2%). While 63.6% of Mtwo and 54.5% of ProTaper and RaCe instruments presented scraping, TF presented scraping only in 27.3% of the samples.
Conclusion: All instruments showed some imperfections. TF instruments presented less manufacturing defects than the instruments manufactured by traditional methods.

P442
Non-Surgical Repair of Iatrogenic Root Perforation Using Mineral Trioxide Aggregate: A Case Report
Taha Özyürek, Cangül Karabulut, Ebru Özsezer Demiryürek
Department of Endodontics, Ondokuz Mayis University, Samsun, Turkey

Aim: To describe the non-surgical treatment of a lateral perforation in the cervical third of the root of a maxillary left incisor using mineral trioxide aggregate (MTA).
Case: 21-year-old female patient was referred our clinic due to cervical root perforation in her maxillary left incisor that occured during erroneous endodontic access cavity preparation by a undergraduate student. Clinic examination showed the tooth was not tender to percussion and palpation. Radiographic examination showed a wide periapical lesion surrounding the apex and also lateral perforation site. Following isolation with rubber dam, proper access cavity was prepared and root canal was explored with aid of ultrasonic instruments. Apical patency was obtained with # 08 C+ file then working length was determined by periapical radiographs. The root canal was prepared up to size #40 K file under copious irrigation with 2% chlorhexidine then dressed with calcium hydroxide. One week later calcium hydroxide was removed and final irrigation was achieved with 2% chlorhexidine. The root canal was obturated with AHPlus and Thermafill technique to the perforation level. Perforation site was restored with MTA and sterile moist cotton pellet was placed onto MTA for setting. One day later setting of MTA was controlled and the tooth was restorated with light cure composite resin. 3rd month follow-up revealed the tooth was asymptomatic and patient had no complaints.
Result: MTA provides an effective seal of root perforations and improves the prognosis of iatrogenic perforated teeth that would otherwise be compromised.

P443
Root Canal Treatment of a Mandibular Canine with Two Canals: A Case Report
Hande Özyürek[1], Taha Özyürek[2], Cangül Karabulut[2]
[1]Department of Dentistry, Tirebolu State Hospital, Giresun, Turkey, [2]Department of Endodontics, Ondokuz Mayis University, Samsun, Turkey

Aim: To present the diagnosis and root canal treatment of mandibular canine showing anatomical variation with two root canals.
Case: 30-year-old female patient was referred to our clinic for root canal treatment of mandibular canine due to symptomatic pulpitis. Clinical examination revealed the pulp was vital, the tooth was not tender to percussion and palpation. Radiographic examination revealed profound dentin caries associated with pulp chamber. Following administration of local anesthesia, the tooth was isolated with rubber dam, the caries was removed and endodontic access cavity was prepared. During examination of pulp chamber floor under magnification via loupe (×4) an extra orifice was explored. Working lenghts were determined by electronic apex locators. Biomechanical preparation was achieved with ProTaper Rotary System up to F5 size under copious irrigation with 5.25% NaOCI. 17% EDTA and 5.25% NaOCI were used for final irrigation. The canals were dried with sterile paper points and obturated by cold lateral compaction technique with AH Plus and gutta percha. The tooth was restorated with light-cured composite resin.
Result: Detection of anatomic variations is essential for successful treatment. Clinicians should consider the possible variations and always search for second root canal in mandibular canines. Magnification with dental loupes and operating microscope enhance the possibility to detect anatomical variations.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P444

Effects of Rotary Instruments on Treatment of Young Permanent Tooth

Ece Çalışkan[1], Didem Öner Özdaş[2]
[1]*Department of Endodontics, Istanbul Aydin University, Istanbul, Turkey,* [2]*Department of Pedodontics, Istanbul Aydin University, Istanbul, Turkey*

Introduction: Large periapical abcess may easily be caused by caries on young permanent tooth if it is not treated at the beginning. The large abcess is treated by either root canal treatment or extraction of tooth.

Case: 12 year old girl patient appealed to the clinic with pain and swelling on lower left second molar tooth. Clinical examination showed extensive carious lesion accompanied with pain on percussion. Pulp testing gave negative result and an extensive radiolucency surrounding both mesial and distal roots were observed in radiographic examination. Root canal preparation was performed with ProTaper rotary system using endomotor (EndoMaster /EMS). Straight line access was achieved with ProTaper Sx file and apical enlargement was concluded with ProTaper F2 file. Canals were irrigated with 2.5% NaOCl. Large periapical lesions can resolve by nonsurgical endodontic therapy employing calcium hydroxide intracanal interappointment medicament. At this case we used calcium hydroxide paste for endodontic therapy for 15 days.

After 15 days, pain on percussion was not present and size of lesion observed to begin decreasing radiographically. Obturation was performed with lateral condensation technique, master cone (ISO 30) and AH Plus. Patient was followed at first, third and sixth month radiographically. The size of the lesion was decreaced markedly. After the root canal obturation the crown of the tooth restored with using split crown(An-Ger G&A polyester crown forms and P250 composite)

Conclusion: Using rotary instrument is not a usual way for treatment of young permanent teeth. The fast success of treatment using rotary instrument may result on young permanent tooth.

P445

In vitro Evaluation of Impact of Rinsendo Irrigation System on Apical Extrusion

Fatma Çiçekdağı, Gülgün Cansu Gündüz, Yıldız Garip Berker
Marmara Üniversitesi Diş Hekimliği Fakültesi Endodonti Anabilim Dali Istanbul

Aim: In this study, the aim was to evaluate the apical irrigant extrusion of Rinsendo, a hydrodynamic activation system, at different needle penetration depths.

Material-method: We used 45 single rooted human teeth. Teeth were instrumentated to an apical size of 25.06 with Protaper Universal® system. After the preparation root canals were irrigated and dried with paper points. A metal device with an apparatus to place the milimetric sheets parallel to teeth were used to position the teeth to observe the apical irrigant extrusion. Teeth were divided into three groups (n:15 for each group) randomly. In group 1 and 2, teeth were irrigated with methylen blue using Rinsendo, which was placed 5 mm and 7 mm short of working length, respectively. In group 3 (control group) teeth were irrigated with methylen blue by positioning a 27 gauge endodontic needle and syringe 1 mm short of working length. Finally, the distance between the most extruded methylen blue stain and the apex of the tooth which was marked on the milimetric sheet was measured.

Result: Significantly less apical extrusion was observed in group 3 in accordance with group 1 ($p = 0.004 < 0.001$) and group 2 ($p = 0.007 < 0.001$). Although there wasn't any significant difference between group 1 and 2, less apical extrusion was observed in group 1 ($p = 0.497 > 0.05$).

Conclusions: Using the conventional irrigation tips results in less apical extrusion when compared to Rinsendo. However, the safety of Rinsendo can be increased by lessening the penetration depth of the needle.

P446

Post Operative Evaluation of Peri-Radicular Healing after Endodontic Surgery

Rajat Pratap Singh[1], Surendra Kumar Mishra[2]
[1]*Rajat Pratap Singh,* [2]*Surendra Kumar Mishra*

Introduction: The purpose of this paper is to evaluate the healing of peri-apical lesions in a group of patients whose teeth were managed with periapical surgery. Periapical surgery should be considered as an extension of non surgical treatment because the underlying etiology of the disease process and the objectives of treatment are same i.e. prevention or elimination of apical periodontitis including the removal of pathological tissue and microorganisms.

Conclusion: The success of periapical surgery depends on proper root canal preparation, Apicectomy & obturation rather than the method of filling whether it is orthograde or retrograde.

Theme: Dental Treatment & Restorative Dentistry: Esthetics

P447

The Effect of Office Bleaching Application on the Color and Translucency of Five Resin Composites

Nurcan Ozakar Ilday, Mustafa Duzyol, Yusuf Ziya Bayındır, Nilgun Seven, Ozcan Karatas
Department of Restorative Dentistry, University of Atatürk, Erzurum, Turkey

Objectives: The aim of this study was to investigate the effect of office bleaching agents on the color and translucency of different resin composites.

Methods: Twenty-four disk-shaped specimens (1 mm thickness, 8 mm diameter) were fabricated from each resin composite (Gradia Direct, Filtek Ultimate, Majesty Esthetic, Valux Plus and Ceram-X) and divided into three subgroups – two different bleaching kits (Hydrogen Peroxide (HP) 38% Opalescence Boost (OB), HP 38% Whitesmile Power Whitening (WP) and a control group (n = 8). Baseline CIE L*a*b* color coordinates were measured

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

using spectrophotometry and translucency parameters (TP) were calculated. Experimental groups were treated with bleaching agents according to manufacturers' instructions. The control group was stored in distilled water (DW) for 14 days. Color and translucency measurements were repeated after bleaching procedures, and color differences were calculated. ΔE values >3.3 were considered clinically unacceptable. Data were analyzed using ANOVA and the paired sample *t*-test ($\alpha = 0.05$).

Results: Clinically unacceptable color change was detected for Majesty Esthetic/OB, Ceram-X/OB, Ceram-X/WP groups ($\Delta E > 3.3$). There was a significant color difference between the control and bleached specimens using different kits ($p < 0.05$). The Ceram-X/OB group (4.13 ± 0.58) exhibited the greatest color change. The highest baseline TP value was in the Ceram-X group (12.47 ± 1.38) ($p < 0.05$). TP values in each group between baseline and the end of the 14th day revealed no statistical significant translucency difference ($p > 0.05$).

Conclusions: Application of two office bleaching kits resulted in clinically unacceptable color change for some resin composites. Translucencies of the resin composites were not affected by office bleaching procedures.

P448

Achieving the Desired Color in Discolored Teeth Using Leucite-Based CAD-CAM Laminate Systems

Sedanur Turgut[1], Bora Bağış[2], Elif Aydoğan Ayaz[1]
[1]*Department of Prosthodontics, Faculty of Dentistry, Karadeniz Technical University, Trabzon, Turkey,* [2]*Department of Prosthodontics, Faculty of Dentistry, Izmir Katip Celebi University, Izmir, Turkey*

Purpose: To evaluate the cumulative effect of the abutment tooth and resin cement color on the resultant optical properties of porcelain laminate veneers (PLVs) fabricated with leucite-based CAD/CAM blocks.

Methods and materials: Two hundred and twenty-four ceramic specimens were prepared from the IPS Empress CAD (Ivoclar Vivadent) with four different shades of HT-A1, LT-A1, MT-A1 and Bl-1. The ceramic discs were cemented to resin composite discs with shade A3.5. For the cementation, different shades of TR (translucent), WO (white opaque), B0.5 (white) and A1 (light yellow) light-cure resin cements (RelyX Veneer) were chosen. L*, a*, b*, chroma and hue values of each cemented ceramic and the A1 shade tab (Ivoclar, Vivadent), were recorded using a colorimeter. Three-way ANOVA, Tukey's HSD tests were used for statistical analyses ($p < 0.05$).

Results: L*, Cab*, hab* and ΔE values of PLVs were influenced by ceramic shade, ceramic thickness, cement shade, and interaction terms of the three variables ($p < 0.001$). There were significant differences between the 1-mm-thick ceramic veneers that exhibited higher L* and lower Cab* values. Using Tr shade cement resulted in lower L* and higher Cab* values for all thicknesses and ceramic shades, whereas the WO shade cement resulted in higher values. ΔE values varied between 2.2 and 11.8 units for the 0.5-mm-thick ceramics and between 0.8 and 8.8 units for 1-mm-thick ceramics.

Conclusions: Clinicians should select the translucency level of the ceramic block with the shade when a leucite-based CAD/CAM system is chosen. Using the WO shade resin cement seems to be more effective in masking the discolored abutment tooth.

P449

Novel Esthetic Treatment of Bilateral Gemination of Maxillary Central Incisors

Heleni Vastardis[1], Iosif Sifakakis[2], Christos Chryssafidis[3]
[1]*Department of Oral Biology, School of Dentistry, National and Kapodistrian University of Athens, Athens, Greece,* [2]*Department of Orthodontics, School of Dentistry, National and Kapodistrian University of Athens, Athens, Greece,* [3]*Department of Operative Dentistry, School of Dentistry, National and Kapodistrian University of Athens, Athens, Greece*

Introduction: Gemination and fusion are developmental anomalies in size, shape and structure of the dentition. Gemination or twinning refers to the development of two teeth from a single tooth bud. As it usually represents an unsuccessful attempt of a tooth bud to divide, gemination results to a variable degree of separation of roots and crowns. Dental fusion is defined as the union of two or more distinct tooth buds and depending on the time and the specific site of the developmental insult, the phenotype of the condition also varies. Both differential diagnosis and clinical management of the conditions constitute major challenges in Dentistry.

A multidisciplinary approach is required to meet patient's needs and expectations and balance possibilities and limitations. While treatment modalities include prosthetic rehabilitation with or without endodontic therapy, Orthodontics and autogenous transplantation, the hemisection of the fused tooth seems to be the treatment approach of choice for most clinicians.

Case: We report a case of bilateral gemination of the maxillary central incisors in an orthodontic adolescent patient and present a conservative restorative treatment via porcelain laminated veneers (PLV) that preserves pulp vitality, ensures proper periodontal ligament function and provides excellent esthetics.

P450

Differences in Color of Maxillary Central Incisor Depending on Gender

Aleksandra Andjelkovic, Dubravka Markovic, Branislava Petronijevic
Department of Dentistry, Medical Faculty, University of Novi Sad, Novi Sad, Republic of Serbia

Aim: Color and the appearance of teeth are complex phenomena under the influence of combined effects of extrinsic and intrinsic coloring as well as optical properties of teeth such as transmission and reflection of light. The aim of this study was to evaluate differences in color depending on gender.

Materials and methods: This study was conducted on 80 dental students (40 males and 40 females) between 20 and 24 years. The color of maxillary right central incisor was determined with intraoral spectrophotometer. As a result of the measuring, VITAPAN classical and VITA 3D-Master color is shown. L*, a* and b* values were noted down for each result. During the research the

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

participants filled in the questionnaire regarding dietary habits and cigarette consumption. The obtained results were processed by using $\chi 2$, *t*-test and Mann-Whitney test.
Results: According to Mann-Whitney test results that were not a statistically significant color differences for women and men teeth. Based on the p value of 0.860573, there was no difference in the lightness of maillary central incisor between genders, nor in red-green tone. Statistically significant difference exists when the blue and yellow balance is concerned.
Conclusions: Considering the limitations of this study, the results show that there is no difference in the color of maxillary central incisor between the genders. Also blue-yellow tone is less visible with female gender students. The consumption of cigarettes, coffee, tea, Coca-Cola, red wine as well as apples and beetroot does not affect teeth color.

P451
Bleaching of Non-Vital Teeth Stained After Endodontic Treatment: Case Report
Aslı Ardıçlı, Emin Türköz
Department of Restorative Dentistry, Gazi University, Ankara, Turkey

Introduction: In recent years, tooth whitening has become one of the most rapidly growing concern of esthetics dentistry. With the growing awareness of esthetics and conservative treatment options, there is a greater demand for the procedures to solve such unsightly problems like tooth staining. Tooth staining may occur due to extrinsic or intrinsic reasons. One of the major causes of intrinsic staining is endodontic treatment. Reasons such as excessive bleeding after the removal of pulp, kind of the materials used for treatment as well as the inadequate or no cleaning of canal filling or sealing materials from pulp chamber during endodontic treatment can cause tooth staining.
Case: The aim of this study was to evaluate the success of bleaching applied with the walking bleaching technique using the agent containing %35 H2O2 (HP whiteness superendo) to the teeth that are stained due to endodontic treatment. Four different patients were treated with bleaching agent containing %35 H2O2. Patient were followed up for 1 year.

P452
Chairside CAD/CAM Technology: A Report of Two Cases
Verda Türel
Department of Restorative Dentistry, Faculty of Dentistry, Atatürk University, Erzurum, Turkey

İn recent years with the rapid advancement of CAD/CAM systems, it has been able to make the dental restorations with the support of computer in the field of dentistry. By using CAD/CAM systems, working methods were simplified and able to use newer and more high-quality materials. This case report presents restorations being used CAD/CAM systems of two cases showing an upper right first molar tooth with the complaint of thermal sensitivity and a maxillary midline diastema. In the first case, it was observed an old composite filling on the tooth. Old filling was removed. By using CAD/CAM system, a ceramic inlay was made then cemented with a dual-cure resin cement. In the second case, teeth were treated with laminate veneer by using CAD/CAM system. CAD/CAM systems are exremely aesthetic but some CAD/CAM systems require expert user and devices are expensive.

P453
Single-Visit Bridges Using Bondable Reinforcement Ribbon and Natural Tooth: A Non-Invasive Technique
Emine Kara
Department of Restorative Dentistry, Yuzuncu Yil University, Van, Turkey

Introduction: Loss of anterior teeth causes a major problem with phonation and esthetics. The replacement of anterior teeth lost by periodontal reasons with porcelain fixed prosthesis can mostly not commute the aesthetics of natural teeth. For this reason, adhesive bridges that have been done using patient own teeth are employed to provide the patient's natural aesthetics. In addition this can be done with a minimally invasive approach. The bondable reinforcement ribbon (Ribbond®) is quite common in adhesive bridges. Ribbond based single-visit bridges provide strength, durability and immediate convenience. Ribbond based bridges are cost effective and reliable.
Case: This case report presents the replacement of anterior teeth which are extracted for periodontal reasons for attaining the function and aesthetic again with adhesive bridges in three different cases.

Theme: Dental Treatment & Restorative Dentistry: Materials

P454
Element-Release from Orthodontic Brackets in Artificial Saliva with Different Acidity
Evşen Tamam[1], Hatice Gökalp[2]
[1]*Department of Prosthodontics, Gazi University, Faculty of Dentistry, Ankara, Turkiye,* [2]*Department of Orthodontics, Ankara University, Faculty of Dentistry, Ankara, Turkiye*

Objective: The increasing use of nickel containing devices in orthodontics and the growing prevalence of nickel allergy in the population significantly increases the interest in biocompatibility studies of these devices. The decisive factor determining the biocompatibility of orthodontic brackets is their corrosion behavior. The aim of study was to test the hypothesis that increased acidity would have affected on amounts of element release from new stainless steel brackets.
Methods: We assayed the corrosion resistance, in terms of ion release, stainless steel orthodontic brackets in artificial saliva with various acidities. Orthodontic brackets (n = 10) were exposed to artificial saliva (37°C) at pH 2.4 and 7 for different periods (1–15 days). The daily amount of Ni and Cr ions released from brackets was determined using an atomic absorption spectrophotometer and an in-vitro day-to-day ion release pattern has been obtained for 15 days. The release amount of individual Ni and Cr

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

ions was statistically analyzed by multifactorial ANOVA for analyzing factors, including the pH, and immersion period. Tukey's test was chosen as the following multiple-comparison technique when necessary.

Results: Results showed that pH value, and immersion period, respectively, had a significantly statistical influence on the release amount of Ni and Cr ions. The higher acidity resulted in higher amounts of ions released for all periods. The amount of Ni and Cr ions released in all test solutions decreased day by day during 15 days period. The amount of Cr ions released in solution for all 15 days period was lower than Ni ions.

P455

A New Technique in the Production of Dental Models: A Vacuum Cabin

Yusuf Ziya Akpınar, Muhammed Ali Aslan, Numan Tatar, Betül Yılmaz

Department of Prosthodontics, Faculty of Dentistry, Abant İzzet Baysal University, Bolu, Turkey

Aim: The purpose of this in-vitro study was to evaluate and compare four different poure tecnniques on the physical properties of dental stones.

Material and Methods: ADA type IV dental stone was used to make a dental cast. Tooth preparation was performed on the prefabricated lower jaw between tooth number of 43 and 33. Impression was taken using Wash technique with C type silicon impression on the preparated teeth. Using four different techniques (manual, vacuum mixer, vacuum mixer + vacuum suction cabin and cabin) on the vibrator machine, ADA type 4 dental plaster was poured into silicone impression. After samples were taken of the impression, the buble countering was performed using 40× steromicroscopy. Sixty millimeter long 30 mm diameter hollow cylinder block made of Teflon mold was prepared for mechanical test. ADA type IV dental stone was poured in the circular teflon mold with four different techniques mainly handed, vacuum mixer, vacuum cabin and combination of vacuum mixer and cabin. A total of 60 specimens were under three point bending test using the universal test machine. One way ANOVA showed significant differences between groups both buble countering ($p < 0.001$) and mechanical test ($p < 0.05$).

Results: The vacuum cabin, a new technique, produced smooth and buble free dental cast. Using the vacuum cabin with combination of vacuum mixer, increased the physical properties of dental cast.

P456

Microtensile Bond Strength of All-Ceramics with Different Core-Veneer Ratio

Cennet Elçin Sağırkaya[1], Erhan Çömlekoğlu[2], Mine Dündar[2], Akın Aladağ[2], Mehmet Ali Güngör[2], Celal Artunç[2]

[1]*Department of Prosthodontics, Ordu University School of Dentistry, Ordu, Turkey,* [2]*Department of Prosthodontics, Ege University School of Dentistry, İzmir, Turkey*

Aim: To investigate the bond strength for differing core (Tc)/veneer (Tv) thickness ratio (1 mm/3 mm; 2 mm/2 mm; 3 mm/1 mm) in all-ceramic systems with microtensile bond strength test method (MTBS).

Materials and methods: Three different veneering ceramics, two of which were feldspathic and the other fluor–apatite, respectively with their corresponding cores, namely zirconium-dioxide (Zirkonzahn Gmbh) (Z), glass-infiltrated alumina (In-Ceram Alumina, Vita) (A) and lithium-disilicate (IPS Emax, IvoclarVivadent) (E) were used for MTBS test. Ceramic cores (8 × 8 mm) (N = 9) were fabricated according to the manufacturers' instructions [core thicknesses for each group: 1 mm (Z1, E1, A1), 2 mm (Z2, E2, A2), 3 mm (Z3, E3, A3)]. The veneering ceramics (3, 2 and 1 mm thickness) were condensed in stainless steel moulds and fired. Ten non-trimmed beam rectangular specimens were obtained from each block (n = 10). The specimens were stored in distilled water (37◦C, 7 days). Bond strength tests were performed in the universal testing machine (Autograph, Shimadzu, Japan, cross-head speed:1 mm/min). The bond strengths (MPa ± SD) were recorded and statistically analyzed (ANOVA, Post Hoc Dunnett T3; $\alpha = 0.05$). The fracture sites were examined with scanning electron microscopy (SEM) (JEOL JSM-5200, Japan).

Results: The mean MTBS values of E2 group were significantly higher (14.04 ± 3.58) than the other groups instead of E3 (11.91 ± 3.04) and A2 (9.59 ± 1.81). Lowest mean MTBS value belonged to group A3 (7.80 ± 1.14). SEM revealed predominantly adhesive failures at the core/veneer interface.

Conclusion: Tc/Tv ratio was a dominant controlling factor for the failure initiation site in bilayered ceramic discs. Tc and Tv should be considered to prevent mechanical failure of the ceramics.

P457

Composites Roughness and Microhardness After Different Bleaching Techniques

Andreia Leal[1], Anabela Paula[1], Miguel Marto[1], Diana Rebelo[1], Pedro Ambrósio[1], Miguel Esteves[2], Amílcar Ramalho[2], Manuel Ferreira[1], Eunice Carrilho[1]

[1]*Dentistry Department, Faculty of Medicine, University of Coimbra, Portugal,* [2]*CEMUC, University of Coimbra, Portugal*

Aim: Evaluate roughness and microhardness of SonicFill™ (Kerr), and compare it with FiltekSupremeXTE™ (3M ESPE) after two bleaching regimens.

Methods and materials: Sixty cylindrical specimens (10 × 2 mm) of each composite were prepared and divided into six groups (n = 20). Groups 1, 2: no treatment. Groups 3, 4: 10% carbamide peroxide (CP). Groups 5, 6: 35% hydrogen peroxide (HP) plus LED. After treatments, specimens were thermocycling (500 cycles, 5°C/55°C, dwell time 30″). Mechanical roughness tester was employed to measure the surface roughness parameters and Vickers test to measure microhardness.

One-Way-ANOVA, Tukey and Bonferroni methods with a significance level of 5% were used for the statistical analysis.

Results: For SonicFill™, there was no statistically significant difference in microhardness between the control group (1) and the bleached groups (3, 5), but there was difference between CP and

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

HP treatments; for FiltekSupremeXTE™ there was no significant difference in microhardness among all groups.

There was no significant difference in Ra and Rq among all groups. Rz parameter showed no statistically differences among all groups for SonicFill™ but, in Filtek SupremeXTE™ there was a significant increase between control and bleaching treatments; Rsk showed no statistically differences among all groups for SonicFill™ and Filtek SupremeXTE™, except for 2 and 4, where the Rsk increased with CP.
Conclusion: The microhardness of FiltekSupremeXTE™ is less affected by bleaching than SonicFill™.

Both bleaching treatments affects Rz in FiltekSupremeXTE™contrary to SonicFill™, but only the CP treatment affects the Rsk in FiltekSupremeXTE™ with no significant effect in SonicFill™.

P458

Microleakage of Pressable and Machinable Ceramic Inlays

Nurdan Polat Sağsöz[1], Ömer Sağsöz[2], Mehmet Yıldız[2]
[1]*Department of Prosthetic Dentistry, Ataturk University, Erzurum, Turkey,* [2]*Department of Restorative Dentistry, Ataturk University, Erzurum, Turkey*

Purpose: The aim of this study was to evaluate microleakage of pressable and machinable ceramic inlays luted with two different adhesive resin cement.
Materials and methods: Forty extracted caries-free human molar teeth were used in this study. Molars were prepared for Class II mesio-occlusal-distal (MOD) inlays with enamel gingival margins. Teeth were divided into two groups according to restoration tecnique; machinable or pressable indirect ceramic inlays, and further divided into two groups again for luting cement; self adhesive resin cement (Rely × U200), adhesive resin cement (Rely × ARC) (n = 10). In machinable ceramic group teeth were received feldspar ceramic inlays made with a CAD/CAM system. In pressable ceramic group teeth were received leucite glass-ceramic inlays made by a dental laboratory. After luting procedure restored teeth were stored in distilled water and basic fuchsin solution (0.5%) each for 24 h at 37°C respectively. Than the teeth were sectioned mesiodistally with a diamond wafering blade mounted on a low-speed saw. Images of restored tooth sections were captured with a digital camera and a five-point scale was used to record microleakage scores. Data were analyzed using one-way ANOVA and Tukey's HSD post hoc tests statistically ($\alpha = 0.05$).
Results: There were significant differences within restoration tecniques and luting cements. Pressable inlays luted with Rely × ARC showed the highest, and machinable inlays luted with Rely × U200 showed the lowest resistance to microleakage.
Conclusion: Restoration tecniques and luting procedures directly affects the microleakage performance, so it is important to choose proper material in dentistry.

P459

Color Stability of Different Resin Based Restorative Materials

Elif Öztürk[1], Gizem Kaçar[2]
[1]*Department of Restorative Dentistry, Hacettepe University, Ankara, Turkey,* [2]*Department of Restorative Dentistry, Kocaeli University, Kocaeli, Turkey*

Aim: The aim of this study was to evaluate the color stability of five different resin composites after immersing in three different soft-beverages for 30 days.
Materials and methods: Two hundred disk-shaped specimens (diameter:10-mm and thickness:2-mm) were made from five different resin composites (FiltekZ550, TetricN-Ceram, ClearfilMajesty-Esthetic, CavexQuadrantUniversalLC, ClearfilAP-X). Each specimen was cured under the mylar strips for 20 s from each of top and bottom surfaces. All of the specimens were stored in distilled water for 24 h at 37°C. The specimens were polished with a multi-step polishing discs (Optidisc, Kerr, CA, USA). Color measurements of each specimen were performed using a spectrophotometer (VitaEasyShade) according to the CIEL*a*b* color scale at baseline and after 30 days of immersion in three different soft-beverages (Redbull, Coca-Cola, and Dimes-Lemonade). Control groups were stored in distilled water during the study. Color changes (ΔEvalues) of the groups were recorded. The data were statistically analyzed using one way repeated measures ANOVA and Bonferroni correction tests (SPSS18.0; $p = 0.05$), as well as a multivariate analysis (GeneralLinearModel) to test the influence of composite type, beverage type and both together.
Results: Significant differences were observed at baseline between the five different resin composites ($p < 0.05$). There were statistically significant differences between the ΔE values of the experimental groups after 30 days of immersion ($p < 0.05$). The effect of composite type (EtaSquaredValue[ESV] = 0.691) on ΔE values of the goups was the highest followed by composite type together with beverage type (ESV = 0.296) and beverage type (ESV = 0.147) respectively.
Conclusions: The tested soft-beverages in the present study caused color changes at a 30-day evaluation period for the tested resin composites.

P460

Numerical Analysis of Damage Mechanics of Dental Trilayer Systems

Ehsan Homaei[1], Omid Barazandeh Ahmadabadi[1], Khalil Farhangdoost[1], Majid Akbari[2]
[1]*Department of Mechanical Engineering, Ferdowsi University of Mashhad, Mashhad, Iran,* [2]*Faculty of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran*

Purpose: To find the optimum combination of materials and thicknesses to provide a tough, damage resistant multi-layer system with numerical methods (XFEM), without the need of exhaustive experiments which are difficult or costly to model.
Materials and methods: Extended Finite element method (XFEM) is used to assess the critical loads for the onset of damage modes such as radial cracks, cone cracks and plastic deformation in dental prostheses, consisting of a spherical indenter contacting a brittle outerlayer (porcelain)/metal (Pd/Co/Au alloys) -core/dentin-substrate trilayer system in concentrated loading. XFEM provides flexibility in modeling, as crack need not be aligned with the element edges. XFEM in particular not only has the ability to successfully solve crack propagation problems but also can model crack initiation process. The overall thickness of metal (dm) and porcelain (dp) layers is assumed to be 1.5 mm (dm+dp).

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Results: It is found that harder and stiffer metal core has the higher critical load for radial cracks. Furthermore, it can be inferred that thinner metal layers are more susceptible to radial cracking, while thicker ones are more exposed to cone cracking. Yielding of metal core makes additional flexural stress at overlaying brittle surface and consequently, facilitates radial cracks.
Conclusions: Generally speaking, the minimum thickness of porcelain layer is recommended to be 0.5 mm, avoiding the structure from cone cracks. Furthermore, the metal layer shouldn't be too thin to protect dentin and inhibit radial cracking. Finally, hardness of metal is better to be high sufficiently to prevent it from plastic deformation.

P461

Comparative Evaluation of Surface Coated Compomer and Glass Ionomer Cement in Vitro

Ilhan Uzel, Fahinur Ertuğrul
Department of Pediatric Dentistry, Ege University, Izmir, Turkey

Aim: Physical and chemical similarity, high compatibility with dental hard tissue and long lasting survival in oral cavities are the requested characteristics of restorative materials. In addition, aesthetic and mechanical characteristics of these materials play a vital role. Therefore, the aim of this study was to evaluate the colour stability and surface roughness of surface-coated or varnish applied high-viscosity glass ionomer cement (GIC) and surface-coated compomer following thermocycling.
Methods and materials: Disc-shaped specimens (n = 10, 10 × 2.5 mm, colour stability specimens; n = 30, 6 × 2.5 mm surface roughness specimens) were prepared forming the following groups; I-Fuji IX GP eXtra, II- Dyract eXtra, III-Fuji IX GP eXtra + Fuji Varnish, IV-Fuji IX GP eXtra + G-Coat Plus, V- Dyract eXtra + G-Coat Plus. Colour and surface profiles were measured at baseline and after thermocycling (5,000 cycles, 5–55°C). Colour measurements were performed (CIE L*, a*, b*) using a spectrophotometer (EasyShade, VITA) and surface roughness (Ra) was determined with a profilometer (Mitutoyo SJ-301). Discoloration data were analyzed using Tukey and Dunnett T3 tests, surface roughness data were analyzed using T and Dunnett T3 tests ($p = 0.05$).
Results: Varnish application created a significant increase in the discoloration ($p < 0.05$) and surface roughness properties ($p < 0.05$) of GIC after thermocycling whereas surface coating did not present any influence on GIC ($p < 0.05$) or compomer ($p < 0.05$).
Conclusions: Varnish application increased susceptibility to discoloration and surface roughness of GIC after thermocycling. Surface coating presented stability against discoloration and surface roughness following thermocycling.

P462

Relation of the Wear Resistance of Dental Materials to their Mechanical Properties

Todor Tsonkov Uzunov[1], Ivan Emilov Chakalov[1], Maria Dimitrova Dacheva[2], Rumen Zlatev Yankov[2]
[1]*Department of Prosthetic Dentistry, Faculty of Dentistry, Medical University, Sofia,* [2]*Institute of Mechanics, Bulgarian Academy of Sciences, Sofia*

Aim: The aim of the present study was to determine the relationship between wear resistance of dental materials and their hardness and elastic modulus.
Material and methods: For the aim of this research five dental composites (Filtek Ultimate "3M ESPE", Filtek Silorane "3M ESPE," Herculite-XRV "Kerr," Charisma "Heraeus Kulzer," Heliomolar "Ivoclar Vivadent") have been used. The chewing simulator "Sofia" has been used to assess the abrasion resistance employing specially designed samples of each of the materials. Afterwards, the samples have been tested by Nano Indenter G200. Instrumented indentation is based on the indentation hardness test applied to small volumes where displacements are continuously monitored during a loading-unloading sequence. Indentation hardness and modulus are calculated from the load-displacement curves taking into account the geometry of the indenter tip.
Results: The wear extent of the five tested materials after 50,000 chewing cycles has been evaluated with profilometer and the obtained results are: Filtek Ultimate – 47.19 μm, Filtek Silorane – 135.24 μm, Herculite-XRV – 67.55 μm, Charisma – 132.85 μm, Heliomolar – 87.27 μm. The values of modulus of elasticity were defined for each of the samples. The indentation hardness (H) of the investigated materials is: Filtek Ultimate – 1,029 GPa, Filtek Silorane – 0.703GPa, Herculite-XRV – 0.605GPa, Charisma – 0.503GPa, Heliomolar – 0.465GPa.
Conclusions: For the five studied composite restorative materials there is no apparent linear relationship between the wear extent and the material hardness and modulus of elasticity. Essential role for the material deterioration have the adhesive and fatigue wear mechanisms observed during the experiment fretting.

P463

Microleakage of Class V Restorations: Compomer, Nanohybrid or Self-Adhesive Flow Composite

Pınar Yılmaz Atalı[1], Berna Gökkaya[2], Faik Bülent Topbaşı[1]
[1]*Department of Operative Dentistry, Marmara University, İstanbul, Turkey,* [2]*Department of Pediatric Dentistry, Marmara University, İstanbul, Turkey*

Aim: The aim of this in vitro study to assess the microleakage of class V cavities restored with compomer, a new self-adhesive flowable composite, a nanohybrid composite, a nanohybrid flowable composite.
Methods and materials: Thirty standardized Class V box cavities were prepared on the buccal surface of maxillary incisors. Teeth were randomly assigned into six groups (n = 5). Grup I: Grandio + FuturoBond NR (Voco); Grup II: Grandio Flow + FuturoBond NR (Voco); Grup III, IV and V: Embrace Wet Bond (EWB) (Pulp-Dent) with no adhesive, with FuturoBond NR (Voco) or PrimeBond NT (Dentsply); Grup VI: Dyract XP + PrimeBond NT (Dentsply). After finishing and polishing, the teeth were stored in distilled water at 37°C for 30 days, coated with nail varnish, and immersed in a %0.05 basic fuchsine, and then longitudinally sectioned. Dye penetration was measured with a stereomicroscope at ×50 magnification at both coronal and gingival margins. Data were analyzed with Kruskal-Wallis, Mann-Whitney and Wilcoxon tests ($p = 0.05$).

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Results: There is no significant difference for dye penetration surface between all groups in coronal ($p = 0.143$) and gingival margins ($p = 0.198$). The application of bonding agent with EWB provided better marginal sealing than those without at class V cavities but it is not significant ($p > 0.05$).
Conclusion: Both resin-based composites and compomer showed microleakage in Class V restorations. Self-adhesive flowable composite may be used with bonding agent to predict better marginal seal.

P464
Influence of Time and Caffeinated Drinks on Colour Stability of Nanocomposite Resin
Farah Hidayah Mohd Fazli[1], Maziahtul Zawani Munshi[1], Haliza Hassan[2], Nik Zarina Nik Mahmood[1]
[1]*Centre of Studies for Restorative Dentistry, Faculty of Dentistry, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia,*
[2]*Centre for Statistical & Decision Science Studies, Faculty of Mathematical and Computer Sciences, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia*

Objective: This study evaluated the influence of time and caffeinated drinks on the colour stability of nanocomposite resin.
Materials and methods: Two nanocomposite resins, Filtek Z350 (3M ESPE) and Grandio (VOCO) of A3 shade were investigated. Hundred and two discs (5 mm × 2 mm) were fabricated using a mold. Fifty-one discs from each brand were polymerized and polished. The discs were then divided into three groups of 17 discs and were immersed in three caffeine mediums; coffee, tea and cocoa at five time intervals; 1, 5, 10, 20 and 30 min. Staining colorimetric value of each disc was assessed by spectrophotometer Minolta CM-C3500. Data from the color change were collected and subjected to statistical analysis by one-way ANOVA ($p < 0.05$). For immersion time, the data were subjected to post-hoc, Tukey Test ($p < 0.05$).
Results: Filtek Z350 and Grandio showed significant colour change ($p = 0.004$) on immersion with caffeinated drinks. The lowest color change of 1 min (0.49 ± 0.19), 5 min (0.61 ± 0.24), 10 min (0.67 ± 0.27), 20 min (0.90 ± 0.30) and 30 min (0.80 ± 0.32) was obtained from Filtek Z350 in coffee medium. Post-hoc, Tukey Test, indicated that there was significant difference in colour changes at 10 min of exposure to all mediums (p value = 0.0001) in Filtek Z350, and as early as 1 min (p value = 0.0001) in Grandio.
Conclusions: Caffeinated drinks significantly affect colour stability of nanocomposite. Filtek Z350 showed color change at 10 min and Grandio at 1 min after exposure to all mediums.

P465
Analysis of Reasons for the Placement and Replacement of Restorations Provided By Selected Dental Practitioners
Hakan Çolak[1], Çoruh Türksel Dülgergil[1], Abdülkadir Şengün[1], Ertuğrul Ercan[1], Bahadır Uğur Aylıkci[2]
[1]*Department of Restorative Dentistry, Kırıkkale, Turkey,*
[2]*Department of Periodontology, Kırıkkale, Turkey*

Aim and objective: The aim of this study was to report the reasons for placement and replacement of direct restorations in public dental services in Turkey.
Materials and methods: A group of dental practitioners working in public dental services were invited to take part in the study. Each participant was asked to record the reason for placement or replacement of restorations from a list of potential reasons. In addition, Class and materials used for each restoration placed and replaced also recorded.
Results: A total of 58 dentists were contacted and 47 responded. Details of the reason for placement or replacement was received on 4096 restorations; 84% of these were first-time restorations and 16% were replacement restorations. The reasons for placement of the restorations were principally primary caries (96%), followed by non-carious defects (%2) and other reasons (2%). Of these, 34% were Class I, 45% were Class II, 21% were Class III, 3% were Class V. The clinical diagnosis of secondary caries (32.5%) was the main reason for replacement of all types of restorations studied, followed by pain (19.2%) and lost of restorations. Resin composite (58%) was the most commonly used restorative material followed by amalgam (37%) and with a minimal use of glass ionomer cement (2%).

P466
Effect of Hemostatic Agent on the Bond Strength of Adhesives
Saffet Başaran, Duygu Tuncer, Derya Merve Halaçoğlu, Kıvanç Yamanel, Çiğdem Çelik, Neslihan Arhun
Department of Restorative Dentistry, Başkent University, School of Dentistry, Ankara, Turkey

Objectives: The aim was to determine the effect of blood contamination and hemostatic agent application on the shear bond strength (SBS) of different adhesives to dentin.
Materials and methods: Seventy-two extracted human molars were used in this study. Teeth were mounted acrylic in moulds. Mesial and distal surfaces were removed to obtain flat dentin surfaces ($n = 144$) and grinded with a 600 grit sandpaper. The samples were randomly divided into four main groups ($N = 36$) based on the adhesive system and application prodecure. Group I: Single Bond 2 (etch-and-rinse). Group 2: Clearfil SE Bond (two-step self-etch). Group III: Single Bond Universal (multimode, etch-and-rinse). Group IV: Single Bond Universal (multimode, all-in-one self-etch). Subgroups composed of no treatment (control), blood contamination and blood contamination+hemostatic agent applications. Resin cylinders (Filtek Z550) were bonded to the dentin surfaces according to the manufacturers' instructions. A shear load was applied to the specimens using universal testing machine at a cross-head speed of 0.5 mm/min until failure. Data were analyzed statistically ($p < 0.05$).
Results: Statistically significant differences were observed between no contamination (control) and blood+hemostatic agent contamination groups for both Single Bond 2 (etch-and-rinse) and Single Bond Universal (multimode, all-in-one self-etch) ($p < 0.05$). When the adhesive systems were compared to each other, no statistically significant differences were found in all contamination groups and control group for the mean SBS values ($p > 0.05$).

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Conclusion: In case of blood contamination or usage of hemostatic agent after blood contamination, SBS of adhesive systems to dentin have a tendency to decrease.

P467

Bond Strengths of Two-Step Self-Etch Adhesives to Laser-Irradiated and Bur-Cut Dentin

Emine Gülşah Göktolga Akın[1], Seyda Herguner Siso[2], Hakan Akin[3]

[1]Department of Restorative Dentistry, Cumhuriyet University, Sivas, Turkey, [2]Department of Restorative Dentistry, Bezmi Alem University, Istanbul, Turkey, [3]Department of Prosthodontics, Cumhuriyet University, Sivas, Turkey

Objective: To evaluate the microtensile bond strength (μTBS) of two-step self-etch adhesive systems to bur-cut and Er:YAG laser-irradiated dentin after water storage and thermocycling.

Materials and methods: Seventy-two-third molars were used in this study and they were randomly divided according to cavity preparation method (bur-cut and Er:YAG laser). Two-step self-etch adhesive systems (Clearfil SE Bond, AdheSE and Adper SE Plus) were used to bond the composite to dentin. Following the adhesive procedure, the specimens were subdivided according to aging conditions (24 h in water control (C), 6 months of water storage (WS) and 10.000 thermocycles (TC). μTBS was determined in a universal testing machine. Three-way ANOVA, independent samples *t*-test and post hoc comparisons test ($\alpha = 0.05$) were performed on all data.

Results: No significant difference was found in μTBS between bur-cut and Er:YAG laser-irradiated dentin ($p > 0.05$). In addition, there was no statistical difference in μTBS between C, TC, and WS specimens ($p > 0.05$). The highest μTBS to dentin was observed in both laser-irradiated and bur-cut cavity preparation methods in Clearfil SE Bond group.

Conclusions: Neither bur-cut or Er:YAG laser-irradiated dentin was affected by the aging methods used to simulate degradation of the adhesive interface. Er:YAG laser treatment may be used as an alternative cavity preparation method.

P468

The Effects of Different Polymerization and Preparation Techniques on the Microleakage of Composite Laminate Veneers

Neslihan Çelik[1], Merve İşcan Yapar[1], Numan Taşpınar[2], Nilgün Seven[1]

[1]Department of Restorative Dentistry, Ataturk University, Erzurum, Turkey, [2]Department of Medical Pharmacology, Ataturk University, Erzurum, Turkey

Purpose: The purpose of this study was to evaluate the correlation of the direct and indirect polymerization technique and different preparation techniques (window, Feather, Bevel, incisal overlap) to microleakage for composite laminate veneers.

Methods and Materials: Eighty-four caries free human maxillary central incisors were randomly assigned to 12 groups ($n = 7$) and designed with four different preparation techniques (1: window type, 2: feather type, 3: bevel type, 4: incizal overlap type). Nanohybrid resin composite was used for preparation. A1 shade was chosen for standardization. Group A; Composite laminate veneers polymerized using direct light curing. Group B; Composite laminate veneers polymerized through indirect polymerization with a combination of pressure, light and heat using a light cup and heat cup, Group C; Composite laminate veneers polymerized using direct polymerization and additionally heat cured in an oven. The specimens were submitted to thermocycling, coated with nail varnish, and then immersed in %5 basic fuchsine solution for 24 h. Following that all specimens were immersed in % 65 nitric acid solution for volumetric dye penetration test. Samples diluted with distilled water and centrifuged. The clearest parts of the solutions were received and microleakage determined by a spectrophotometer (wavelength 600 nm). Data were analyzed by two way ANOVA and Tukey post hoc multiple comparisons test ($p < 0.05$).

Results: Comparison of direct and indirect polymerization techniques revealed no statistically significant difference between composite laminate specimens ($p > 0.05$). There were significant difference between preparation technique ($p < 0.05$). Microleakage value of window type was lower than the other preparation techniques.

P469

Temperature Rise During Composite Resin Polymerization at Different Curing Times and Curing Modes

Nurcan Özakar İlday, Omer Sagsoz, Ozcan Karatas, Yusuf Ziya Bayındır

Department of Restorative Dentistry, University of Atatürk, Erzurum, Turkey.

Objective: This study evaluated temperature rise in silorane- (Filtek Silorane) and dimethacrylate-based (Filtek Z550) composite resin systems at different curing times and curing modes.

Materials and methods: Forty dentin disks (1.5 mm thickness, 8 mm diameter) were prepared from sound human third molars. Composite resins polymerized with a LED light curing unit (LCU), in two modes (Plasma mode 3,6,9,+2 s/Normal mode 10,20,30,+2 s). Temperature rise in the dentin samples under the composite resin disks was measured using a K-type thermocouple wire connected to a data logger. Differences (ΔT) between baseline and each time interval were recorded. Data were analyzed using ANOVA and the independent sample t test ($\alpha = 0.05$).

Results: There were significant differences in mean temperature rises between different modes and polymerization times ($p < 0.05$). Light polymerization of silorane-based composite resin (Filtek Silorane) resulted in significantly higher temperature rises than in dimethacrylate-based composite (Filtek Z550) for each polymerization time interval and curing mode ($p < 0.05$).

Conclusion: With the exception of two groups (Filtek Silorane baseline/30 s and Filtek Silorane baseline/30 + 2 s), maximal temperature increase determined in all groups was not critical for pulpal health.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P470

Effects of Cavity Configuration and Flowable Composite Liner on Microtensile Bond Strength to Dentin

Fatma Ayaz, Dilek Tagtekin, Funda Yanıkoglu
Department of Restorative Dentistry Marmara University, Istanbul, Turkey

Objective: Due to polymerisation shrinkage of resin based composites, a high configuration factor in deep Class I cavities leads to a certain amount of stress when the material is bonded. The aim of this in vitro study was to evaluate the influence of C-factor and intermediary flowable composite liner on bonding to dentin.

Methods: Forty extracted human third molars were randomly divided into two groups. Class I cavities and flat dentin surfaces on the same dentin depth were prepared and further divided into four subgroups according to the employed adhesive/composite combination. Two adhesive systems Solobond M (Voco) or Clearfil SE Bond (Kuraray) were used in conjuction with a composite (Herculite XRV, Kerr) placed incrementally. A flowable composite GrandioSO Heavy Flow (Voco) or Clearfil Majesty Flow (Kuraray)] was applied as a liner in half of the teeth of each group with their corresponding adhesives. Four stick specimens with 1 mm² of bonding area were prepared from the center of the each tooth. All specimens were thermocycled for 5000 cycles between 5 and 55°C and subjected to micro-tensile bond strength (μTBS) test.

Results: Kruskal Wallis and Mann Whitney *U* tests were used for the statistical analyses. The adhesive systems evaluated were not significantly different ($p > 0.05$). The flat surface groups exhibited higher bond strengths than the cavity groups. No statistical difference was seen between the groups with and without flowable composite liner ($p > 0.05$).

Conclusion: Increasing C-factor negativelly effected the μTBS. Using a flowable composite liner is not an effective technique to improve the μTBS.

P471

Effects of Surface Conditioning Methods on Repair Bond Strengths of Amalgam Restorations

Özden Özel Bektaş[1], Gülşah Göktolga Akın[1], Diğdem Eren[1], Mutlu Özcan[2]
[1]*1Department of Restorative Dentistry, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey,,* [2]*Clinic for Fixed andRemovable Prosthodontics and Dental Materials Science, Center for Dental and Oral Medicine, University of Zürich, Switzerland*

Object: This study tested the bond strength of a resin cement to a fresh and an aged amalgam after six conditioning methods using shear test method.

Materials and methods: One hundred and twenty specimens were prepared by filling the amalgam into a teflon split mold Then specimens were divided into two main groups (fresh and aged). For aging; 60 specimens were subjected to 5,000 thermocycles. Then groups were divided into six subgroups according to surface conditioning method used. In this way, 12 grups were obtained. Gr1- fresh amalgam- Al2O3+ alloy primer; Gr2- fresh amalgam- Frez; Gr3- fresh amalgam -silica coating + Silane; Gr4-fresh amalgam-Laser; Gr5- fresh amalgam-silicon carbide (Control); Gr6-fresh amalgam- Al2O3+ silane; Gr7-aged amalgam- Al2O3+ alloy primer; Gr8-aged amalgam-Frez; Gr9-aged amalgam- silica coating + Silane; Gr10- aged amalgam-Laser; Gr11- aged amalgam-silicon carbide (Control); Gr12 aged amalgam-Al2O3 + silane. After conditioning of the surfaces with related protocols, the bonding agent was applied. The resin composite was bonded to amalgam by use of molds (inner diameter: 3.6 mm and height: 4 mm). Then, the samples were attached to the jig of universal testing machine with a notched blade attached to a compression load. Shear force was applied as close as possible to the surface of the substrate at a crosshead speed of 0.5 mm/min until fracture occurred.

Results: Shear bond strength test method results yielded with the different surface conditioning methods showed statistically significant differences ($p < 0.0001$). Silica coating followed by silanization showed higher bond strength results compared to those of other conditioning methods.

P472

Preventing Microbial Adhesion by Different Coating Materials on PMMA

Meral Arslan Malkoç[1], Nilüfer Tülin Polat[1], Ayçe Ünverdi Eldeniz[2], Hilal Şiriner[1], İsmail Hakkı Uzun[1]
[1]*Department of Prosthodontics, Faculty of Dentistry, İnönü University, Malatya, Turkey,* [2]*Department of Endodontics, Faculty of Dentistry, Selçuk University, Konya, Turkey*

Objectives: The aim of this study was to investigate the effect of different ceromers on denture base acrylic resin in the inhibition of oral microbial adhesion.

Methods: Heat polymerized acrylic resin was used in this study. For the evaluation of the antimicrobial activity, 80 standardized acrylic resin specimens were obtained. Each specimen was prepared to a uniform size (10 mm • 10 mm • 2 mm) and polished using silicon carbide abrasive paper up to #1000 under running water. Specimens were divided into four groups ($n = 20$): non-coated group, Glimo-Teos coated group, a Glimo-Teos + ZiO2 coated group and a Glimo-Teos+ TiO2-coated group. Specimens were submitted to the adherence assay with C. albicans (ATCC 90028). Adhered cells were detached from the acrylic resin surface by ultrasonic waves in phosphate buffered saline solution (PBS). This cell solution was serially diluted in PBS and plated on medium.

Descriptive data were analyzed by means of one-way ANOVA (parametric approach), $\alpha = 5\%$. Post hoc multiple comparisons were performed according to Tukey HSD test (5%).

Results: There were significant differences on Glimo-Teos +TiO2 (4.69 ± 0.2) group when compared to other groups ($p < 0.05$), but no statistically significant differences were found among the non-coating (5.45 ± 0.3), Glimo-Teos (5.29 ± 0.2) and Glimo-Teos + ZiO2 (5.26 ± 0.2) groups ($p < 0.05$).

Conclusion: Results indicate that Glimo-Teos +TiO2 coating is suitable for clinical application, but further studies using different test methods are needed for this coating material.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P473

Evaluation of Cytotoxicity of Ceromer-Coated PMMA by Real-Time Cell Analysis

Nilüfer Tülin Polat[1], Esma Başak Gül[1], Derya Özdemir Doğan[2], Ahmet Altun[3], Mustafa Hayati Atala[1]

[1]Department of Prosthodontics, Faculty of Dentistry, İnönü University, Malatya, Turkey, [2]Department of Prosthodontics, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey, [3]Department of Pharmacology, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey

Objective: The aim of this study is to evaluate the cytotoxicity of various ceromer coated PMMA by real- time cell analyzer.

Methods: Forty-eight disc specimens (5 × 2 mm) of heat polymerized acrylic resin were prepared according to ISO 10993–5 protocol. Six groups were formed; heat-polymerized acrylic resin, post-polymerization heat applicated group, Glymo+TEOS, Glymo+TEOS+ZnO2, Glymo+TEOS+TiO2 and Polymer A174 + TEOS coated acrylic groups. After the sterilization, materials were incubated in Dulbecco's modified eagle's culture medium for 1, 4 and 7 days. A real-time cell analyzer was used to evaluate the cell survival. After seeding 100 ml of the L-929 fibroblast cell suspensions into the wells (20,000 cells/well) of the E-plate 96, the cells were exposed to 100 ml of extracting solution containing the components released by the acrylic resins (1/1 and 1/2 dilutions) and monitored every 1 h for 85 h. The statistical analyses used for the proliferation experiments were one-way analysis of variance (ANOVA) and Tukey-Kramer multiple comparisons tests.

Results: None of the studied groups were found cytotoxic for both dilutions and different time intervals ($p > 0.05$).

Conclusion: None-of the used coating agents were found to be cytotoxic. Further studies about the cytotoxicity of ceromers would be helpful to better understand the biological risks and to improve the biocompatibility of the ceromers.

P474

Effect of Coating with Different Ceromers on the Mechanical Properties of PMMA

Esma Başak Gül[1], Mustafa Hayati Atala[1], Nilüfer Tülin Polat[1], Meltem Asiltürk[2], Ahmet Gültek[3]

[1]Department of Prosthodontics, Faculty of Dentistry, İnönü University, Malatya, Turkey, [2]Department of Material Science and engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey, [3]Department of Chemistry, Faculty of Arts and Sciences, İnönü University, Malatya, Turkey

Objective: The aim of this study was to evaluate the transverse and impact strength and elastic modulus of heat-polymerized acrylic resin after coating with different ceromers.

Methods: Transverse strength and modulus of elasticity test specimens were prepared in the dimensions of 65 × 10 × 2.5 mm (5 groups, n:10). The dimensions of the impact strength test specimens were 60 × 7.5 × 4 × mm (5 groups, n:10). Test group specimens were coated with Glymo-TEOS, Glymo-TEOS-TiO2, Glymo-TEOS-ZrO2 and A174-TEOS, control groups were non-coated.

The specimens were tested for transverse strength with the use of a 3-point loading apparatus in a universal testing machine. The impact test was carried out with a Charpy-type pendulum impact tester. The data were analyzed with multifactorial analysis of variance and Tukey post hoc tests ($p < 0.05$).

Results: Glymo-TEOS-TiO2 and A174-TEOS had significantly increased the transverse strength of PMMA. All ceromers had caused statistically significant increase in the elastic modulus of PMMA. While the Glymo-TEOS-ZrO2 had significantly decreased the impact strength, the increase in the strength values of other ceromers was not statistically significant.

Conclusion: Coating with ceromers had substantially improved the mechanical properties of PMMA.

P475

The Effect of Ceromer-Coating on Some Physical Properties of PMMA

Nilüfer Tülin Polat[1], Meral Arslan Malkoç[1], Bekir Eşer[1], Güler Yıldırım Altuntarım[1], Meltem Asiltürk[2]

[1]Department of Prosthodontics, Faculty of Dentistry, İnönü University, Malatya, Turkey, [2]Department of Material Science and Engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey

Objectives: The aim of this study is to investigate the effect of ceromer coating on the water sorption, solubility and dimensional stability of a heat-polymerized acrylic resin.

Methods: Water sorption and solubility tests were done according to the ADA 12 standards. Conventional heat-polymerized acrylic resin disks (50 ± 1 × 0.5 ± 0.05) were prepared. The specimens were separated into two groups randomly. The testing group was coated with Glymo-Teos. The water sorption and solubility values (g/cm3) were calculated.

In order to evaluate the dimensional stability, 10 brass specimens (20 × 12 × 2 mm) with stainless steel spheres (1 mm diameter) as reference points on each corner were prepared. Two groups of acrylic (n = 10) were prepared from the brass specimens. The testing group was coated with Glymo-Teos. Various measurements were done with various phases, such as polymerization, drying, 15, 30 days of incubation period. The distance between the reference points were measured in μ with a camera attached to a stereomicroscope. Four measurements for each specimen were transferred into one value with vectorial calculation.

Water sorption and solubility data were evaluated with independents samples-t test and dimensional stability values were evaluated with paired sample t and independent sample t tests.

Results: Water sorption and solubility values of Glymo-Teos group were statistically significantly ($p < 0.05$) lower than the control group. The dimensional decrease in Glymo-Teos group between the "metal-drying" phases was significantly higher ($p < 0.05$) than the acrylic group.

Conclusion: Ceromer coating of acrylic resin had lowered the water sorption and solubility values, and increased the dimensional change of the acrylic resin.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Theme: Dental Treatment & Restorative Dentistry: Pedodontics

P476

Effect of KTP Laser and Ozone in Primary Root Canals

Arife Kapdan[1], Alper Kuştarcı[2], Tutku Tunç[3], Zeynep Sümer[3]
[1]*Department of Pediatric Dentistry, Faculty of Dentistry, Cumhuriyet University, Sivas, Turkey,* [2]*Department of Endodontics, Faculty of Dentistry, Akdeniz University, Antalya, Turkey,* [3]*Department of Microbiology, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey*

Aim: The objective of this study was to evaluate the antimicrobial activity of KTP laser and gaseous ozone in experimentally contaminated root canals of primary teeth.
Materials and methods: Forty eight root canals from primary insisors teeth were selected. After preparation and sterilization, the specimens were inoculated with 10 µl Enterococcus faecalis for 24 h at 37°C. The contaminated roots were divided into two experimental groups, one negative control group, and one positive control group of 20 teeth each: Group 1, KTP laser group (1,5 W); Group 2, gaseous ozone group (150 s); Group 3, sodium hypochlorite group (NaOCl) (negative control); and Group 4, saline group (positive control). Sterile paper points used to sample bacteria from the root canals were transferred to tubes containing 5 ml of brain heart infusion broth. Then 10 µl suspension was incubated in culture media for 24 h. The colonies of bacteria were counted and data were analyzed statistically using Kruskal-Wallis and Mann-Whitney U tests.
Results: There were statistically significant differences between all groups ($p < 0.05$). Complete sterilization was achieved in the 2.5% NaOCl group. The number of bacteria was significantly reduced in experimental groups in comparison with the positive control group.
Conclusions: Although KTP laser and gaseous ozone have a significant antibacterial effect on infected root canals of primary teeth, with the gaseous ozone being more effective than the KTP laser, 2.5% NaOCl showed the best antibacterial effect.

P477

The Evaluation of the Bluegrass Appliance's Effectiveness in Children with Thumb-Sucking Habit

Begüm Gök, Zuhal Kırzıoğlu
Department of Pediatric Dentistry, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey

Aim: The aim of this study is to implement the Bluegrass appliance to children with thumb-sucking habit who do not respond to the reminder treatment, and to evaluate the results.
Methods: Aged between 4 and 11 years, one hundred sixty-one children admitted to the Pedodontics clinic with a thumb-sucking habit were included in the study. The patients were initially given a reminder treatment for 2–3 weeks. The Bluegrass appliance was prepared for 28 children who did not respond to the reminder treatment and who accepted to participate in the study. The required ethical and parental consents were obtained. If the habit was ceased or not, the time for the cessation of the habit, and the 2-year follow-up period were evaluated.
Results: Thirty-two out of 161 patients discontinued the therapy. The reminder treatment failed in 92 patients. Twenty-eight children who did not respond to the reminder treatment accepted to participate in the Bluegrass appliance treatment. Eight patients did not show up for the control examinations, and were excluded from the study. The study was continued with 20 patients. The Bluegrass appliance had a success rate of 72% in children aged between 4 and 6 years, who constituted 65% of all patients. The success rate was lower in children aged between 9 and 11 years, who constituted 35% of all patients.
Conclusion: The effective period for the appliance was determined as 2–3 months. The Bluegrass appliance gave better results, especially in children aged between 4 and 6 years.

P478

Management of Orofacial Infection in Pediatric Patients Attending a Dental Clinic in Ankara

Hasan Ayberk Altug, Metin Sencimen, Gurkan Rasit Bayar, Tamer Zerener, Abdullah Tugrul Coskun
Department of Oral & Maxillofacial Surgery, Gulhane Military Medical Academy, Ankara, Turkey

Introduction: Orofacial infections are common in pediatric patients. Bacterial invasion, chemical irritation, or trauma can cause orofacial infections. The most common cause is dental caries and after that bacterial invasion of the tooth pulp. The inflammation begins with a necrotic pulp and spreads into the surrounding periodontal ligament and bone. The inflammatory process causes bone resorption. Orofacial infections can turn into abscess and may be collected in maxilla-facial region such as submandibular abscess.
Methods and materials: We examined management of orofacial infection on five pediatric patients who attended a dental clinic in Ankara (2010–2012). The average age of the patients was ten. Our patients were three girls and two boys. There were three submandibular abscesses, one buccal abscess and one fossa canina abscess in our events. All of abscesses were occurred by dental caries.
Conclusion: Although orofacial infections affect both sexes equally some studies shows a preponderance of girls. Caries is main etiology for orofacial infections in children. The treatment of choice for orofacial infections of dental origin is root canal therapy for a restorable tooth or extraction for a nonrestorable tooth.

P479

Oral Health Status of 9–11 years Old Latvian Children

Julija Kalnina, Inga Rendeniece, Simona Skrivele, Ruta Care, Anda Brinkmane
Department of Conservative Dentistry, Riga Stradins University, Riga, Latvia

Aim: To determine the prevalence and severity of dental caries, oral hygiene and periodontal conditions in 9–11 year old children.
Materials and methods: The sample consisted of 158 patients (88 boys, 70 girls) aged 9–11 years (mean 9.81 ± 1.15) were examined clinically and by bitewing X-ray for caries diagnosis. Caries severity (DMFT, dmft) and caries prevalence (% DMFT > 0, % dmft > 0) were calculated. Oral hygiene was evaluated by a Silness & Löe plaque index, simplified oral hygiene

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

(OHI-S) Green-Vermillion index. The periodontal conditions were recorded using CPITN (Community Periodontal Index of Treatment Needs). The study was given ethical approval by Riga Stradiņš University Ethical Committee.
Results: Ninety percent of examined children had caries, mean dmft and DMFT index (decayed, missing and filled teeth) were 3.54 (±2.16) and 1.86 (±1.98), mean dmfs and DMFS (decayed, missing and filled surfaces) were 7.15 (±5.41) and 2.98 (±3.53). Mean Silness & Löe plaque index was 1.53 (±0.70), mean simplified oral hygiene (OHI-S) Green-Vermillion index was 2.21 (±0.99). An average of 1.35 sextants had healthy periodontal tissue, gingival bleeding was detected in 3.32 sextants, calculus – 1.32 sextants.
Conclusions: Results of this study suggest high caries prevalence and insufficient oral hygiene in Latvian children. The above findings stress the need for an effective program of oral prevention in these children.

P480

Dahl Concept in the Treatment of a Complicated Trauma Case

Didem Sakaryalı, Alev Alaçam
Department of Pediatric Dentistry, Gazi University, Ankara, Turkey

Introduction: Vertical dimension is an important factor for satisfactory aesthetic and functional restorations. To increase the vertical distance temporary crowns, orthodontic treatment, extention of the length of crowns and Dahl concept can be applied.
Case: This case report describes treatment procedures for a thirteen year old patient whom vertical dimension decreased after a traumatic injury. As a result of the clinical evaluation, complicated crown fracture on the right central incisor and mobility on the left central incisor was observed. In the radiological evaluation crown root fracture on the left central incisor had diagnosed. After extraction of fractured coronal part of the left central incisor, root canal treatment was initiated for both teeth. The following treatment was planned as fiber post and strip crown restoration. However, during endodontic treatment period, increased overbite was developed. For ideal aesthetic and functional restorations it is planned to increase the vertical dimension. In this case Dahl concept applied as an acrylic anterior bite plane to increase the interocclusal space for available restorations. After using Dahl appliance for 10 weeks, sufficient distance for fiber post and strip crown restoration was obtained and final restorations have done. There was no aesthetic and functional problems during 2 years.
Conclusion: The Dahl concept appears to be safe and avoids performing destructive restorative procedures on compromised teeth.

P481

Knowledge and Attitude about Light Curing Units: A Survey of Dental Clinicians in Samsun, Turkey

Sezin Özer[1], Emine Sen Tunç[1], Nuray Tüloglu[2], Sevgi Canbaz[3]
[1]*Department of Pediatric Dentistry, Faculty of Dentistry, Ondokuz Mayıs University, Samsun, Turkey,* [2]*Department of Pediatric Dentistry, Faculty of Dentistry, Osmangazi University, Eskisehir, Turkey,* [3]*Department of Public Health, Faculty of Medicine, Ondokuz Mayıs University, Samsun, Turkey*

Purpose: The aim of this study was to evaluate dental clinicians' knowledge and attitude about light curing units and material science in Samsun, Turkey.
Materials and methods: A total of 448 dental clinicians were sent a letter introducing the study and asking for their cooperation. Data was collected using a self-reporting questionnaire in which dental clinicians were asked about demographic information, current LCUs and material science.
Results: A total of 184 questionnaires were returned, giving a response rate of 41%. All of the respondents were used RBCs. Most of the respondents (75; %41) preferred LED units. Although 102 (55%) of the respondents had LCUs which offer different options for irradiation, most of them used conventional mode for irradiation. According to the results dental clinicians had low level of knowledge about LCUs and material science.
Conclusion: Based on the results, it seems necessary for dentists to take part in continuing dental education programs related to the newer technologies to improve their knowledge and practice.

P482

In vitro and SEM Assessment of Resin Crowns with Post-Core in Primary Teeth

Zuhal Kırzıoğlu[1], Anya Dalmış[2], Yücel Yılmaz[3], Ayşegül Sarıtekin[1]
[1]*Department of Peadiatric Dentistry, Suleyman Demirel University, Isparta, Turkey,* [2]*Dental Hospital, Aydin, Turkey,* [3]*Department of Peadiatric Dentistry, Ataturk University, Erzurum, Turkey*

Aim: This study compared the fracture load, tensile strength, failure mode, fracture extent and SEM evaluation of short post core plus celluloid resin composite crowns on primary anterior teeth.
Materials and methods: A total of 88 extracted primary anterior teeth were used. Mushroom-shaped retention undercut was performed in the root. The teeth were randomly divided into four groups and restored with short post-core plus celluloid crown forms using hybrid, flowable packable composites, and short fiber post plus flowable composite. Half of the teeth in each group were selected for fracture load and tensile strength tests and SEM evaluation. The crowns were fractured or dislodged. Two teeth restored from each groups were micrographed under SEM. All data were statistically analyzed.
Results: The fracture load and tensile strength values ranged 232N to 350N and 181N to 224N, respectively. There was a significant difference among the groups for fracture load ($p < 0.05$), but not significant for tensile strength ($p > 0.05$). Packable composite exhibited lower values than did those of the other groups. A significant difference existed in failure types among groups ($p < 0.05$). Failure types was predominantly mixed for groups, except for short fiber post plus flowable composite. For failure extents, there was no significant difference among the groups ($p > 0.05$). A close interface connection was observed in flowable composite group under SEM.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Conclusion: This study showed that the higher fracture load and tensile strength values a short-post plus composite celluloid crown possessed, the lower would be the possibility failure.

P483

Dental Age in A Group of Turkish Children with Tooth Agenesis

Derya Ceyhan, Zuhal Kırzıoğlu
Department of Pediatric Dentistry, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey

Aim: To determine the development degrees of teeth in children with tooth agenesis and to compare those with children with no tooth agenesis and to give a direction to clinical approaches and forensic sciences and anthropology.
Methods: Files of 452 patients who presented to our clinic and were eventually diagnosed as cases of missing teeth, were reviewed. Aged between 7 and 15 years, healthy patients with at least one congenital permanent missing tooth excluding 3rd molars and complete records with saticfactory panoramic radiographs and similar socio-economic background and ethnic origin were specified. Sixty-six individuals with 1–6 missing teeth and 20 individuals with more than six missing teeth were included in group I and group II, respectively. Forty-two healthy individuals with no tooth agenesis were included in control group. The differences between the dental age estimated by Haavikko's method and the chronological age were evaluated by statistically. Correlation coefficent between the number of missing teeth and the differences between ages was calculated.
Results: In respect to differences between ages, the differences between group means were statistically significant ($p < 0.05$). Boys and girls, in group I, group II and control group, were 1.1, 1.7, 0.4 years and 1.2, 1.5, 0.6 years, respectively, more rested in the dental age than the chronological age. Calculated correlation coefficent between the number of missing teeth and the differences between ages was 0.439 and it was statistically significant ($p < 0.05$). As the number of missing teeth increases, difference between the ages increases.
Conclusions: Our results show that tooth agenesis and it's severity affect tooth development.

P484

Effects of Er:YAG Laser on Mineral Content of Sound Dentin in Primary Teeth Using ICP-AES Technique

Cigdem Guler[1], Meral Arslan Malkoc[2], Veli Alper Gorgen[1], Erhan Dilber[3], Mehmet Bulbul[4]
[1]Department of Pediatric Dentistry, Faculty of Dentistry, İnönü University, Malatya, Turkey, [2]Department of Prosthodontics, Faculty of Dentistry, İnönü University, Malatya, Turkey, [3]Department of Prosthodontics, Şifa University, Faculty of Dentistry, İzmir, Turkey, [4]Department of Prosthodontics, Faculty of Dentistry, Gaziantep University, Gaziantep, Turkey

Aim: The aim of this study was to evaluate the mineral content of sound dentin in primary teeth prepared using an Er:YAG laser at two different power settings.
Materials and methods: The study teeth comprised 33 primary second molars which were randomly divided into three equal groups. The occlusal third of the crowns were cut with a slow-speed diamond saw. The groups were as follows: group A, control group; group B, dentin irradiated with the Er:YAG laser at 3.5 W;and group C, 4 W. The levels of Ca, K, Mg, Na and P in each dentin slab were measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES). One sample from each group was evaluated using scanning electron microscopy (SEM). Data were analysed by one way analysis of variance and Tukey HSD tests.
Results: There were no significant differences among the groups for Ca, K, Mg, Na, and P level, or for the Ca/P ratio ($p > 0.05$). SEM micrographs indicated that the surface irregularities increased with increased power setting.
Conclusion: Er:YAG laser treatment at two different power setting did not affect the mean percentage weights of Ca, K, Mg, Na, and P level, or the Ca/P ratio.

P485

A Novel Technique for Restoring Infected Anterior Primary Teeth under GA

Manal Ahmed El Shiekh, Mervat Abd Elmoniem Rashed, Dalia Mohamed Moheb
Department of Pediatric Dentistry, Faculty of Dentistry, Cairo University, Cairo, Egypt

Dental caries is the most common chronic disease of childhood& restoration of severely decayed primary anterior teeth is often considered as a special challenge by pedodontists. The principle goal of pediatric restorative dentistry is to restore the damaged teeth to enable them perform normal function and also from an esthetic point of view.
Objective: The aim of this study was to evaluate the clinical and radiographic success new technique for root canal filling of pulpally affected primary anterior teeth.
Methods: Fifteen healthy children 3–5 years old, without sexual variation were included in a cases series study. The children had pulpy involvement upper anterior teeth; all cases were treated under GA.

Root canal cleaning and shaping for the affected teeth followed by filling of the apical one-third of the root canals with Metapex (Meta biodent.) and the rest of the canals and the NuSmile crowns were filled with Fugi IX or Riva luting (SDI) for crown cementation at the same time.
Results: All treated cases showed satisfactory results in terms of clinical and radiographical evaluations over 1 year follow up. None of these cases showed any signs of periapical infection or crown root fracture.
Conclusion: This novel technique may offer a good approach for restoring decayed primary anterior teeth under general anathesia.

P486

Evaluation of Oral and Dental Status in Children after Bone Marrow Transplantation

Özlem Martı Akgün[1], Ceren Yıldırım[1], Günseli Güven Polat[1], Feridun Başak[1], Aybarshan Yılmaz[1], Orhan Gürsel[2], Vural Kesik[2]
[1]Department of Pediatric Dentistry, Gulhane Medical Academy, Ankara, Turkey, [2]Department of Pediatrics, Gulhane Medical Academy, Ankara, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: To assess the count of the number of decayed, missing, filled teeth (DMFT), gingival health, and oral status of children after bone marrow transplantation (BMT).
Materials and methods: Thirty-one patients (10 females, 21 males; mean age = 10.38) treated with BMT and 31 healthy children (18 females, 13 males; mean age = 9.74) were selected for this randomized clinical study. The study protocol was approved by the Research Ethics Committee and written informed consent was obtained from all participants. All dental examinations were applied by one calibrated examiner and performed under natural light using a dental mouth mirror and a metallic dental probe. The dental examinations of the study group were applied 100 days after BMT. The DMFT, Plaque Index (PI), Gingival Index (GI) and Bleeding on Probing (BOP) values were recorded. For the statistical analysis and calculations SPSS for Win (SPSS, Ver. 15.0, Chicago, IL, USA) was used. The level of significance was set at $p \leq 0.05$.
Results: The differences between PI, GI, and BOP (p 0.05) values were not statistically significant in both groups. Although DMFT index values were lower in children treated with BMT compared to children from the control group, the difference between the two groups was not statistically significant ($p = 0.054$).
Conclusions: Although children in study group have a high risk for dental caries and periodontal problems, there were no differences in all indexes values between both groups due to the fact that periodic oral examination was performed by a dentist before and after BMT.

P487

Multidisciplinary Approach for Treatment of Fusion Anomaly

Mehmet Sinan Doğan[1], Serhat S. Atılgan[2], Mehmet Ünal[1], Ayşe Günay[1], Yasemin Yavuz[3]
[1]Department of Pedodontics, Faculty of Dentistry, Dicle University, Diyarbakir, Turkey, [2]Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, Dicle University, Diyarbakir, Turkey, [3]Department of Restorative Dentistry, Faculty of Dentistry, Dicle University, Diyarbakir, Turkey

Aim: Tooth abnormalities consist depending on hereditary, trauma, systemic or local factors during the period of development of the teeth. Fused teeth may occur when tooth germs contacted with adjacent tooth germ by physical acts.

This clinical case is presented anomally of supernumerary tooth and maxiller permanent incisal tooth.
Case report: Nine-years-old male patient was admitted to the Dicle University Department of Pediatrıc Dentistry for complaining of aesthetic, After clinical and radiographic examination were realized fusion between maxillary incisal teeth with supernumerary teeth. The patient's was evaluated with maxillofacial surgeon. Then were decided to take the tooth at palatal position. Restorative treatment of the patient's was performed remaining teeth. There was no symptoms at clinical and radiographic follow-up after 6 months.
Conclusion: Especially dental abnormalities appear in the anterior region importance, because cause problems of function, aesthetics, phonation and orthodontic. Teeth abnormalities should be evaluated clinically and radiologically and treated multidisciplinary approach. Early diagnosis and treatment of these anomalies, prevents unwanted problems in the future.

P488

Relationship Between Body Mass Index and Dental Caries Among Children in Istanbul

Aslı Patır Münevveroğlu, Beyza Ballı Akgöl, Tuğba Erol
İstanbul Medipol Üniversitesi Diş Hekimliği Fakültesi Pedodonti Anabilim Dalı

Aim: The aim of this study was to investigate the association between age-and gender-specific body mass index (BMI-for-age) and dental caries among children aged 2–12 years in İstanbul, Turkey.
Methods: The dmft/DMFT index (following World Health Organization criteria) were used to assess the subjects' dental caries experience. The BMI (Body Mass Index) percentile was calculated using BMI-for-age criteria as underweight (<5th percent), normal-weight (5th–85th percent), at risk of being overweight (>85th and <95th percent) and overweight (> or = 95th percent).
Results: Of children examined, 54.5% were normal-weight, 22.2% were at risk of being overweight, and 23.3% were overweight. The mean dmft was 3.32 and the mean DMFT was 0.36. There was no significant difference between dmft/DMFT scores amongst the BMI-for-age groups.
Conclusion: Almost one in five children (22.2%) examined were deemed to be at risk of being overweight, or were classified as overweight (23.3%). There was no association between dmft/DMFT scores and BMI-for-age scores.

P489

Shear Bond Strength of Composite Resins on Primary Tooth Enamel

Çiğdem Küçükeşmen[1], Selim Erkut[2], Hakkı Cenker Küçükeşmen[3]
[1]Department of Pediatric Dentistry, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey, [2]Department of Prosthetic Dentistry, Faculty of Dentistry, Başkent University, Ankara, Turkey, [3]Department of Prosthetic Dentistry, Faculty of Dentistry, Süleyman Demirel University, Isparta, Turkey.

Aim: The aim of study was to determine the shear bond strengths (sbs) of composite samples polymerized with halogen light source which were bonded to primary molar's enamel with total-etch and self-etch bonding systems.
Materials and methods: In study, a total-etch bonding system (Single Bond, 3M/USA), a self-etch bonding system (One-Step, Bisco/USA) and a composite resin material (Charisma, Heraeus-Kulzer/Germany) were used. Samples were bonded with total-etch and self-etch bonding systems on teeth's surfaces (n = 10), and they were polymerized for 40 s with a conventional halogen light source (Hilux 200, Benlioğlu/Turkey, 450 mW/cm2). Sbs values were tested with an universal test device (LRX-Universal, Lloyd Instruments/England, 1 mm/min). Values were initially measured as "Newton (N)," then they were calculated as "MegaPascal

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

(MPa)." Data were statistically analysed with Two-Way-ANOVA ($p < 0.05$). Fracture types of samples were determined under a stereomicroscope (Leica AG, CH-9435 Heerbrugg, Switzerland, ×25 resolution) and thay were calculated as percentage (%).
Conclusion: "Sbs" values of composite samples bonded to primary teeth enamel with total-etch bonding system were statistically found higher (20.7 MPa) than "sbs" values of samples bonded to primary teeth enamel with self-etch system (15.9 MPa; $p < 0.05$). Fracture type was mostly observed as "adhesive (60–80%)" in total-etch and self-etch groups respectively. As a result, both bonding systems and composite material were found succesful to provide enough shear bond strength on primary tooth enamel. In addition, self-etch bonding system was found preferable for young or handicaped children and even, geriatric patients owing to its ability of providing shorter clinical working times.

P490
Rare Hamamy Syndrome: Clinical and Dental Findings
Cigdem Guler, Gul Keskin
İnönü University, Faculty of Dentistry, Department of Pediatric Dentistry, Malatya, Turkey

Aim: Hamamy syndrome is a rare genetic disorder. Severe hypertelorism with midface prominence, myopia, mental retardation, and bone fragility can be caused by homozygous mutation in the IRX5 gene on chromosome 16q11.2. Hanan Hamamy discovered the syndrome in 2007.
Clinical reports: In this paper we describe the clinical and dental findings of this syndrome in a 10 year old boy referred to the dental clinic because of severe pain in Malatya, Turkey. His parents were consanguineous marriage. His brother also affected syndrome. Clinical finding was diagnosed mild hypertelorism with midface prominence, and osteopenia with repeated fractures. Myopia, hearing loss, mental retardation, heart disease, and blood disorder were not detected. Dental finding included enamel hypoplasia, severe dilacerated maxillary and mandibular incisor and lateral teeth, delayed eruption of teeth, taurodontizm, loss of lamina dura and malocclusion. The dental treatment included root canal treatment, composite restorations, extractions and removable prostheses.
Conclusion: This paper highlights features of Hamamy syndrome and its dental rehabilitation.

P491
Intracoronal Radiolucent Lesion Treated with Endodontic Regenerative Therapy
Zeliha Hatipoğlu, Didem Atabek, Neşe Akal
Department of Pediatric Dentistry, Gazi University, Ankara, Turkey

Aim: The aim of this report is to introduce the regenerative endodontic treatment protocol using a variation of the triple antibiotic paste of an immature tooth with intracoronal radiolucent lesion.
Case: A 10 year-old girl was referred to Gazi University Department of Pediatric Dentistry with complaint about mandibular right second premolar tooth that developed abscess. After radiographic examination, incomplete root formation (1/3 root formation) was diagnosed. The tooth was irrigated with 5.25% sodium hypochlorite with minimal instrumentation, followed by triple antibiotic (metronidazole, ciprofloxacin and amoxicillin) paste dressing. Instead of minocycline that principally recommended for regenerative procedures, amoxicillin is used in order to avoid the discoloration of the crown. At a subsequent visit, the antibiotic paste was removed, a blood clot aroused in the canal by irritating periapical tissues and the canal was sealed with BioAggregate (Innovative BioCeramix Inc. Vancouver, British Columbia Canada), glass ionomer cement and composite resin.
Conclusion: According to the 12 months radiographic and clinical follow-ups, the tooth was symptomatic with no discoloration, periapical radiolucency was healed and the root continued to develop.

P492
Revascularization of Immature Permanent Incisors with Necrotic Pulps
Aylin Akbay Oba[1], Seda Alp[1], Merve Erkmen Almaz[1], Işıl Sönmez[2]
[1]*Department of Pediatric Dentistry, Kırıkkale University, Kırıkkale, Turkey*, [2]*Department of Pediatric Dentistry, Adnan Menderes University, Aydın, Turkey*

Aim: The purpose of this study was to evaluate the clinical efficacy of 3Mix-MP paste on pulp revascularization for necrotic immature anterior permanent teeth.
Materials and methods: The study was carried out with ethical committee approval and the informed consent form was signed by the parent or the guardian. Thirty teeth of twenty-three patients (8–14 ages), each with an immature permanent tooth with pulp necrosis, were recruited. A triantibiotic mix was used to disinfect the pulp for 2 weeks. Then a blood clot was created in the canal, over which mineral trioxide aggregate was placed. Patients were recalled periodically (1, 3, 6 and 12 months).
Results: One of the patients did not attend any recall appointments. Eleven teeth were excluded from the study (as a result of pain or failure to induce bleeding after canal disinfection) and instead received a standard apexification procedure. After follow-up sessions, the remaining teeth ($n = 18$) were found to be asymptomatic, apical periodontitis was resolved and there was radiographic evidence of proceeding root development.
Conclusion: Revascularization could be effective for managing immature permanent teeth with pulpal necrosis with appropriate case selection.

P493
Clinical Evaluation of Two Different Restorative Materials in Primary Teeth
Fatih Şengül, Taşkın Gürbüz
Department of Pediatric Dentistry, Ataturk University, Erzurum, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Introduction: The aim of this study was to evaluate clinical success of primary teeth class II lesions restored with compomer and giomer composite resin followed up for 24 months.
Materials and methods: This study was carried out on 74 primary molars of 23 children (13 boys, 10 girls) in the age range of 5–7 years. The class II lesions in primary molars of a patient were restored using compomer (Dyract AP) and giomer (Beatiful). Restorations were evaluated according to FDI-criteria and their survival rates were determined. Data were analysed with Pearson chi-square, Kaplan-Meier and Wilcoxon (Breslow) tests ($\alpha = 0.05$).
Results: The failure rates of general, aesthetic, functional and biological evaluation results of compomer were 33.3%, 19.4%, 33.3%, and 14.9% and of giomer were 15.8%, 7.9%, 15.8%, and 13.2%, respectively. There was not any statistically significant difference in restorative materials at the end of the 24 months. Functional failure was the main factor in restorative material failure.

Theme: Dental Treatment & Restorative Dentistry: Periodontics

P494
MDR1 Gene Polymorphisms and Drug Induced Gingival Overgrowth
Erkan Şüküroğlu[1], Feriha Çağlayan[2], Güliz N. Güncü[2], Doğukan Yılmaz[2], Mustafa Göktaş[3], Melih Babaoğlu[3]
[1]Department of Periodontology, Karadeniz Technical University, Trabzon, Turkey, [2]Department of Periodontology, Hacettepe University, Ankara, Turkey, [3]Department of Pharmacology, Hacettepe University, Ankara, Turkey

Objective: Gingival overgrowth is a known side effect of particular drugs. However pathogenesis of this side effect is uncertain. P-glycoprotein (P-gp) is a transport protein that has an important role on the effectiveness and distribution of these drugs. Polymorphisms of the gene (MDR1) coding P-gp can alter the expression and function of this protein. The aim of the present study was to investigate the certain MDR1 polymorphisms as risk factors for gingival overgrowth.
Methods and Materials: One hundred and six patients including 36 cyclosporine, 25 phenytoin, 25 nifedipine and 20 diltiazem users were enrolled in the study. Periodontal clinic parameters and the degree of gingival overgrowth were evaluated. Genetic analysis of C3435T and G2677/A polymorphisms were also investigated from blood samples by PCR.
Results: As expected, all clinical periodontal parameters were significantly higher in patients with gingival overgrowth in all drug groups, except diltiazem. However, any statistically significant association between single nucleotide polymorphisms in C3435T and G2677/A polymorphic regions of MDR1 gene and gingival overgrowth was not detected for all drug groups.
Conclusions: According to the present results, it can be suggested that MDR1 C3435T and G2677T/A polymorphisms are not risk factors for drug induced gingival overgrowth. Due to the limited number of the participants, further studies conducted on larger patient groups may clarify the impact of the MDR1 gene polymorphisms on drug induced gingival overgrowth.

P495
Therapeutic Effects of Melatonin on Alveolar Bone Resorption After Experimental Periodontitis in Rats. A Biochemical, Histochemical and Stereologic Study
Oğuz Köse[1], Seçkin Özkanlar[2], Taner Arabacı[1], Varol Çanakçı[1], Sümeyra Akman[1]
[1]Faculty of Dentistry, Department of Periodontology, Ataturk University, Erzurum, Turkey, [2]Faculty of Veterinary Medicine, Department of Biochemistry, Ataturk University, Erzurum, Turkey

Aim: The present study aimed to investigate effects of systemic melatonin administration on alveolar bone resorption process in experimental periodontitis in rats.
Methods: Twenty-one male Sprague Dawley rats were divided into three groups (C: control, Ped: periodontitis induced, and Mel+Ped: periodontitis induced and treated with melatonin). For the periodontitis induction, the rats' first molar teeth were ligatured submarginally for 5 weeks. After the ligatures removal, melatonin treatment was begin to given Mel+Ped groups with a single dose of 10 mg/kg/Bw for 15 consecutive days. End of the treatment period, all groups animals were anesthetized. After intracardiac blood collection, all animals were sacrificed and mandible tissues were removed for histopathologic and biochemical analysis. Serum samples were used the determined to calcium (Ca), phosphorus (P), and bone alkaline phosphatase (B-ALP) concentrations. Myeloperoxidase level was determined in the gingival tissue homogenates. All animals right mandibles were used to histopathologic analysis.
Results: In the biochemical analysis, melatonin treatment was decreased the alveolar bone resorption and MPO activity. According to immunohistochemical receptor activator of nuclear factor kappa-B ligand (RANKL) staining, osteoclast activity was decreased with the melatonin treatment.
Conclusion: This study evidenced that alveolar bone resorption increased with the increase of oxidative stress-mediated osteoclast cell activity, and emphasized that osteoclast activity decreased, while the concentration of B-ALP could be increased with the melatonin administration.

P496
Preemptive Etodolac for Pain Prevention after Traditional and Flapless Dental Implant Surgeries: A Double-Masked, Parallel-Group, Placebo-Controlled, Randomized Clinical Trial
Oğuz Köse, Taner Arabacı, Cenk Fatih Çanakçı, Alparslan Dilsiz, Alper Kızıldağ
Department of Periodontology, Faculty of Dentistry, Ataturk University, Erzurum, Turkey

Aim: This study aimed to investigate the effects of preemptive single dose etodolac medication on pain prevention and patient comfort following conventional flapped and flapless dental implant surgeries.
Materials and methods: Thirty-two patients who had bilateral partial or total tooth deficiency at their upper jaw were divided into two groups. Half of the patients were selected for traditional

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

surgery and others for flapless surgery. Each patient received etodolac, 600 mg, or placebo randomly 1 h before the surgeries. Pain intensity and discomfort scores were recorded by participants based on a visual analog scale and four-point verbal rating scale at postoperative 1st, 2nd, 4th, 6th, 12th, 24th and 48th hours. Furthermore; patients were suggested to use a rescue analgesic only if the pain was intolerable, and to record it.
Results: Etodolac was superior to placebo in both traditional and flapless surgery groups and results were more superior in flapless-etodolac group especially at 2nd, 4th and 6th hours. Rescue medication use was more excessive in traditional-placebo group than others. Moreover, pain and discomfort scores and rescue medication using were almost similar in traditional-etodolac and flapless-placebo groups.
Conclusion: The findings of this study suggest that the preemptive single dose etodolac, 600 mg, medication was considerably effective in the management of postoperative pain and discomfort following both surgeries.

P497

Effects of Two Different Periodontal Recall Programs on Oral Hygiene and Gingival Health of Patients Undergoing Fixed Orthodontic Treatment: A Year Follow Up

Oğuz Köse[1], Taner Arabacı[1], Filiz Akkabak[2], Cenk Fatih Çanakçı[1], Varol Çanakçı[1]
[1]Faculty of Dentistry, Department of Periodontology, Atatürk University, Erzurum, Turkey, [2]Faculty of Dentistry, Department of Orthodontics, Atatürk University, Erzurum, Turkey

Objective: To compare the effects of two different periodontal recall programs on gingival health of patients undergoing fixed orthodontic treatment.
Materials and methods: Fifty-four adolescents, who will be undergoing fixed orthodontic treatment, were divided into two equal groups (Group 1, Group 2). Group 1 was selected for periodontal recall program consisting of 4-week intervals, and Group 2 was selected for periodontal recall program consisting of 3-month intervals. The periodontal parameters (plaque index [PI], gingival index [GI] and bleeding on probing [BOP]) were recorded at the baseline and at the all recall appointments during 1 year.
Results: All periodontal parameters showed a significant increase from the baseline to the first recall appointment for either group ($p < 0.01$). Group 2 had significantly lower PI, GI and BOP values than Group 1 at all recall appointments ($p < 0.01$).
Conclusions: This study emphasized that periodontal recall program consisting of 4-week intervals seemed to be more successful than the recall program consisting of 3-month intervals in terms of periodontal health of patients undergoing fixed orthodontic treatment.

P498

Severity of Pain During Supportive Periodontal Treatment Using a Er, Cr: YSGG Laser or a Sonic Scaler

Mükerrem Hatipoğlu, Burak Kale, Zeliha Aytekin, Mehmet Özgöz
Department of Periodontology, Akdeniz University, Antalya, Turkey

Background: The aim of this study was to evaluate the subjective intensities of pain during supportive periodontal treatment using a Er, Cr: YSGG laser or sonic scaler.
Methods and materials: Thirty patients with periodontal pockets (≥5 mm, at least two areas) following conventional periodontal therapy were treated using a sonic scaler and an Er, Cr: YSGG laser. A visual analogue scale (VAS) was used for pain assessment directly after each treatment procedure.
Results: Pain assessment during treatment showed that laser treatment (mean: 0.8, max:3, min:0) caused less pain than the sonic device (mean: 3.8, max: 8, min: 1) ($p < 0.05$) with no difference in the treatment time.
Conclusions: The results indicated that using an Er, Cr: YSGG laser during supportive periodontal treatment, painful sensations can be reduced compared with sonic scaler instrumentation.

P499

Occlusal Correction in A Compromised Periodontium – A Finite Element Study

Pratibha Panduranga Kundapur[1], Gowtham Suresh Perumalswamy[2], Bailoor Satish Shenoy[3]
[1]Department of Periodontics, MCODS, Manipal University, Manipal, India, [2]Department of Dental surgery, PSG Institute of Medical Sciences and Research, Dr. MGR Medical University, Coimbatore, India, [3]Department of Automobile and Aeronautical Engineering, MIT, Manipal University, Manipal, India

Background: Premature contacts on teeth may be a factor in the progression of periodontal disease.
Aim: The present study evaluated the effect of premature occlusal contacts and their correction using coronoplasty on the magnitude and distribution of forces in the periodontium. The influence of proximal support was also assessed.
Materials and methods: Finite element models of a mandibular molar with normal as well as compromised periodontal support were constructed using ANSYS 11. Four situations were considered: (1) Normal occlusal contacts in a tooth with healthy periodontium (2) Premature occlusal contacts in a tooth with healthy periodontium (3) Same occlusal prematurities in a tooth with compromised periodontium (4) Coronoplasty performed on models to eliminate premature contacts. Each of these models had an additional subcategory of presence of adjacent tooth contact mesially. 100 N force was delivered in the centric occlusal contact points of the teeth. Maximum von Mises stress in the periodontal ligament and bone were then assessed.
Results: Occlusal forces, which were axial in direction in centric contacts, increased in magnitude and changed direction in the presence of a premature contact. Higher stresses were observed when there was no adjacent tooth contact. Following coronoplasty, the forces decreased in magnitude. The periodontally compromised tooth without adjacent contact benefitted the most out of occlusal correction.
Conclusion: Occlusal correction by coronoplasty may bring about substantial changes supporting healing in a compromised periodontium. Moreover, presence of the adjacent tooth may allow more favourable distribution of loads.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P500

The Effect of Oral Mouthwashes on Dark Pigmented Subgingival Bacteria

Natasa Nikolic Jakoba[1], Milena Radunovic[2], Selma Bilalovic[1], Sasha Jankovic[1], Vojislav Lekovic[1]
[1]Department of Periodontology, Faculty of Dental Medicine, University of Belgrade, Belgrade, Serbia, [2]Department of Micobiology and Immunology, Faculty of Dental Medicine, University of Belgrade, Belgrade, Serbia

Introduction: Among subgingival dental plaque bacteria, the most aggressive potential have Gram-negative anaerobic dark pigmented bacteria including *P. gingivalis*, *P. intermedia* and *P. nigrescens*. The use of oral antiseptics is widespread in the treatment of periodontal disease in order to reduce the number of microorganisms responsible for their initiation and progression.
Aim: The aim of this study was to evaluate the antimicrobial effect of eight oral antiseptics on dark pigmented bacteria of subgingival dental plaque.
Materials and methods: Fifteen patients suffering from chronic periodontitis were included in the study. Periodontal status and oral hygiene were recorded. Pooled samples of subgingival dental plaque transported in 1 ml thioglycolate broth were inoculated on Schedler agar for the purpose of cultivation. From the total bacterial cultures, dark pigmented colonies were selected to obtain subcultures. Discs of filter paper, 5 mm in diameter, soaked with examined mouthwashes were placed on the Schedler agar. Diameter of the growth inhibition zone of bacterial colonies around the disks was measured 7 days following inoculation.
Results: Active oxygen® and Gengigel® showed no antibacterial activity on treated bacteria. Other examined mouthwashes (Curasept 220®, Colgate Plax®, Perio Aid 0.12®, Perio Aid 0.05®, Vitis®, Lacalut®) demonstrated antibacterial effect with no statistically significant difference in diameter of the growth inhibition zone among them.
Conclusion: Most of the examined mouthwashes showed antibacterial effect on dark pigmented subgingival bacteria, which justifies their use in the treatment of periodontal disease.

P501

Improvement of Indexes of Arteriosclerosis with Treatment of Periodontal Disease

Nobuhiro Sasaki[1], Noriko Sasaki[2], Ritsugou Hirose[2], Kuniko Hirose[2], Fumitaka Kobayashi[3]
[1]Tokyo Dental College Dept of microbiology, [2]Katsutadai Dnetal Clinic, [3]Tokyo Dental College Dept of Clinical Pathophysiology

Purpose: We examined the morbidity of periodontal disease in patients who had had carotid echography and measured arteriosclerosis related markers and periodontal disease related makers in the blood serum to more clearly identify the relationship between chronic periodontitis and arteriosclerosis.
Methods and materials: In principle, 12 patients were selected that had chronic periodontitis, who had not received antibiotic on the first visit. Examination of fingertip plasma IgG antibody titers against periodontopathic bacteria was contracted to the Leisure Inc. and it examined the antibody tiers of four types of bacteria (A.a.,P.g.,P.i.,E.c.) by using an ELISA method in which a method described by Murayama et al. (Ad Dent Res, 1988) was modified. The blood serum was separated from peripheral blood by normal methods and tests on arteriosclerosis related markers (C-reactive protein = hs-CRP), TNF-α and adiponectin were contracted to the SMS Corporation.
Results: The average ratio of a pocket of 7 mm or more, in the six males, was 34.1%, and that of females was 5.5%. A correlation between a prevalence of periodontal pockets of 7 mm or more, and a serum antibody titer against P.g., was observed and the antibody titer (6.9) in males was higher than that (2.08) of the females. The average value of the arteriosclerosis related markers in serum were as follows: for males, CRP: 0.134 mg/dl; TNF-α: 1.71 pg/ml; and adiponectin: 8.1 μg/ml, and for females, CRP: 0.091 mg/dl; TNF-α: 1.01 pg/ml; and adiponectin: 17.5 μg/ml.

P502

Covering of a Multiple Miller III type Gingival Recession

Sıla Cagrı İsler, Mustafa Özcan, Gönen Özcan
Department of Periodontology, Gazi University, Ankara, Turkey

Introduction: The recession of gingiva is increasingly becoming a more prominent condition for patients because of root hypersensitivity, erosion, root caries and aesthetic considerations. The main goal of plastic periodontal surgery procedures is to obtain root coverage and optimal aesthetic appearance. Several new techniques have been used to achieve root coverage for the surgical treatment of multiple adjacent recession type defects. The modified tunnel technique is an alternative technique which has minimizing surgical trauma and achieving predictable aesthetic result. Surgical treatment of class Miller III defects ara more challenging, mainly due to loss of inter-proximal bone and soft tissues.
Case: In this case report, a 40 year old female patient had class Miller III gingival recession on her maxillary premolars. The gingival recession defect was treated a modified tunnel technique in combination with a subepitelial connective tissue graft.
Conclusion: The use of a microsurgical concept with minimal invasive surgical technique which improves the success rate of connective tissue grafting and increases the amount of root coverage, reduces surgical trauma and allows more precise approximation of the wound margins.

P503

The Effects of Obesity on Local and Circulating Levels of Tumor Necrosis Factor Alpha and Interleukin 6 at Patients with Chronic Periodontitis

Oğuz Köse[1], Cenk Fatih Çanakçı[1], Abdulkadir Yıldırım[2], Varol Çanakçı[1], Taner Arabacı[1], Alparslan Dilsiz[1], Ebru Sağlam[1]
[1]Department of Periodontology, Faculty of Dentistry, Atatürk University, Erzurum, Turkey, [2]Department of Biochemistry, Faculty of Medicine, Atatürk University, Erzurum, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: The aim of this study is to evaluate the possible effects of obesity to the local and systemic tumor necrosis factor-alpha (TNF-α) and ınterloukin-6 (IL-6) levels in patients with chronic periodontitis (CP).
Material and method: According to the study protocol, four groups which each one were consisted of twenty-two subjects were planned as follows: periodontally healthy patients with normal weight (O-P-); patients with normal weight and CP (O-P+), periodontally healthy patients with obesity (O+P-) and patients with obesity and CP (O+P+). Serum and salivary samples were obtained a week before the recording of clinical periodontal parameters. Local and systemic levels of TNF-α and IL-6 were measured as biochemically.
Results: In serum and saliva, both TNF-α and IL-6 levels were the lowest in (O-P-) group ($p < 0.05$). The highest TNF-α and IL-6 levels were observed in (O+P+) group, while only IL-6 levels were statistically significant ($p < 0.05$).
Conclusion: It was observed that local and systemic TNF-α and IL-6 levels were significantly increased in obese patients with periodontitis. The findings of our study show that obesity may play a role on periodontitis by negatively influencing the inflammatory parameters act in the pathogenesis of periodontal diseases.

P504

Treatment of Single Tooth Recession with Laterally Displaced Flap: A Case Report

Kemal Akdemir, Elif Öncü, Ramazan Sağıcı
Department of Periodontology, Necmettin Erbakan University, Konya

Introduction: This technique, originally decribed by Grupe and Warren in 1956 was the standart technique for many years and is still indicated in some cases. The laterally positioned flap can be used to cover isolated, denuded roots that have adequate donor tissue laterally and vestibular depth.
Case: Thirty-two years old female who has 7 mm cilinical atachment loss (CAL) on left maxillary canin was treated with this techique. After removing epithelium around the denuded root surface the exposed connective tissue was the recipient site for the laterally displaced flap and we scaled and planed the root surface. First full-thickkness after partial-thickness flap was used because of the thickness of the gingiva but the latter is preferable because it offers the advantage of more rapid healing in the donor side and reduces the risk of loss of facial bone height. With a #15 blade, a vertical incision from the mesial of canin and distal of second premolars' gingival margin was made to outline a flap adjacent to the recipient site. A releasing incisions were made to avoid tension on the base of flap, which can impair the circulation when the flap is moved. After sliding the flap laterally on to the adjacent root we fixed the flap to the adjacent gingiva and alveolar mucosa with interrupted sutures.

The clinical measurements made at baseline, after 2 weeks, 1 and 12 months. The mean coverage of the recessions was 90% and there were no bone loss, dehiscence and fenestration in the donor site.

P505

Effect of Periodontal Health, Oral-Hygiene and Socio-Demographic Structure on Halitosis

Başak Kuşakcı Şeker[1], Atilla Berberoğlu[2], Emre Şeker[3], Hayriye Tümer[2]
[1]*Department of Periodontology, Faculty of Dentistry, Osmangazi University, Eskisehir, Turkey,* [2]*Department of Periodontology, Faculty of Dentistry, Near East University, TRNC, Mersin 10, Turkey,* [3]*Department of Prosthodontics, Faculty of Dentistry, Osmangazi University, Eskisehir, Turkey*

Objective: The purpose of this study was to evaluate the association of oral malodor with periodontal-health, tongue-coating, oral hygiene practices, smoking and socio-demographic variables and to compare organoleptic-scores (OS) with Halimeter® measurements.
Methods: A questionnaire-survey was conducted to patients who recruited at the Periodontology Department between January and November 2011 by interview. 612 (298 female/314 male) subjects aged 20–80 years (mean-age;39.07 ± 14.79) were divided into four age-groups (20–34, 35–49, 50–64, 65–80). Subjects self-reported their halitosis, medical-history, oral hygiene habits, education-level and smoking-status. In the clinical examination, values of oral malodor were gathered through organoleptic assessment and by the measurement of volatile-sulphur-compounds (VSCs). Plaque-index (PI), calculus-index (CI), bleeding on probing (BOP), pocket-depths, tongue-coating-score (TCS) and decayed-missing-filling-teeth-index (DMFT) were recorded.
Results: The prevalence of halitosis was found 51.9% for the organoleptic assessment ($OS \geq 2$) and 54.08% for the Halimeter® measurement ($VSCs \geq 110pbb$). There were significant correlation between OS and VSCs values in general-population and age-groups [(r: 0.82), ($p < 0.05$)]. Significant correlation found between OS-VSCs values and PI [(rOS:0.45;pOS < 0.05), (rVSC:0.41;pVSC < 0.05)], CI [(rOS:0.46;pOS < 0.05), (rVSC:0.40; pVSC < 0.05)] (except 65–80), mean value of pocket depth [(rOS: 0.56; pOS < 0.05), (rVSC:0.61; pVSC < 0.05)], the-deepest-pocket value [(rOS:0.69;pOS < 0.05), (rVSC:0.73;pVSC < 0.05)], TCS [(rOS:0.55;pOS < 0.05), (rVSC:0.44;pVSC < 0.05)] and DMFT (except 35–49, 50–64) [(rOS:0.25;pOS < 0.05), (rVSC:0.23; pVSC < 0.05)]. In addition there were significantly differences between BOP, oral hygiene habits, education-level, age, self-reported halitosis and OS-VSCs values[(pOS < 0.05), (pVSC < 0.05]. For the logistic regression analysis results, the factors most strongly associated with VSCs values are respectively:TCS [(OR:2.85), ($p < 0.05$)], the deepest pocket value[(OR:2.09), ($p < 0.05$)] and daily using of dental floss [(OR: 1.87), ($p < 0.05$)].

Tongue-coating, the deepest-pocket value and daily-flossing were the factors that most strongly associated with VSCs values. Organoleptic score could still be considered as the gold standard for diagnosis of halitosis according to our findings.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P506

The Prognosis of the Tooth with Endodontic Periodontal Combined Lesion Treated by Regenerative Approach: 5 year Follow, A Case Report

Mehmet Vehbi Bal, Vahdi Umut Bengi
Department of Periodontology, Gulhane Military Medical Academy, Ankara, Turkey

Background: In the treatment of endodontic – periodontal combined lesions are compremised as a result of differential diagnosis and unpredictable prognosis. These lesions requires both endodontic theraphy and periodontal regenerative procedure. Several techniques and materials present different treatment choices as providing more successful prognosis. In this case report, we present a treatment of an incisor tooth which had an endodontic-periodontal combined lesion result of trauma with mucogingival – regenerative approach and the prognosis of treatment in 5 years.
Case: A 20 year old male patient revealed to our Dental Department suffering discoloration on his 41 numbered tooth. Intraoral examination revealed crown fracture and deep Miller II gingival recession with 7 mm probing depth at buccal site and there was an severe apical radiolusency at periapical radiography. Also, the tooth showed no vitality without mobility. In the treatment procedure, firstly non-surgical periodontal treatment completed. Eight weeks later, a large buccally flap opened, granulomatous tissues removed. Root canal treatment and apically resection applied. Defect area filled with demineralized bone greft and flap primarly closed using double-flap technique. Six weeks after, crown restoration have completed with composite and fiber post. Clinically and radiographically successful results of the treatment have been observed for 5 years with the stability of periodontal soft and hard tissues.
Conclusion: We concluded that in treatment of the teeth with severe endodontic-periodontal combined lesion and muco-gingival problem can be treated in the same operation with long-term stable and successful results.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

P507

Computer-Controlled Immediate Provisionalization Using Ovoid Pontic Design

Firuzan Tan, Pınar Ateş, Mine Dündar Çömlekoğlu, Muharrem Erhan Çömlekoğlu, Celal Artunç
Department of Prosthodontics, School of Dentistry, Ege University, Izmir, Turkey

Introduction: The ovoid pontic design in a fixed dental prosthesis (FDP) has been recommended for gingival contouring and rehabilitation of extraction sockets in the esthetic region besides proper functioning. The convex design of ovoid pontic maintains a concave soft tissue outline.
Case: After intraoral and radiographic examination of a 25-year-old male with increased mobility and pain due to trauma in maxillary incisors, intra-oral digital impression was made (Cerec AC Blue Cam, Sirona). The extraction of both maxillary central incisors followed by an immediate provisional FDP with ovoid pontic design were planned after the extraction for socket preservation. After teeth preparation and before surgery, the central incisors were resected from the digital model to perform a concave soft tissue outline in the edentulous ridge mucosa and physiologic stimulus of the soft tissue. Provisional restorations were modelled immediately using a computer-aided design (Cerec 4 software, Sirona) and milled from acrylic blanks (Telio CAD, IvoclarVivadent -Cerec MCXL, Sirona). After glazing, restorations were temporarily luted (TempoCem®NE). Dental floss was checked for free passage between the pontics. After 2 weeks the convexity of the pontics was decreased. A definitive CAD/CAM fabricated (IPS e-max zirCAD, IvoclarVivadent) zirconia FDP was prepared 1 month after placement of the provisional restoration.
Conclusion: After a follow-up period of 6 months, interdental papilla, gingival contour, consistency and esthetic appearance were clinically healthy and the patient had no complaints. Long-term clinical trials may be reqired for the clinical outcome of ovoid pontic design effect on FDPs.

P508

Palatinal Laminate Veneers in Case of a Nutritional Disorder

Gamze Öztürk, Muharrem Erhan Çömlekoğlu, Habibe Öztürk, Mehmet Sonugelen
Department of Prosthodontics, School of Dentistry, Ege University, Izmir, Turkey

Introduction: Ceramic veneers are a conservative and minimal invasive treatment approach for esthetic and functional rehabilitation of compromised anterior teeth. This protective treatment can also help in rehabilitation of hypersensitivity of eroded or abraded teeth. CAD/CAM materials and milling techniques also aid in achieving optimized, durable and design-controlled prosthetic restorations.
Case: In this clinical report, an alternative use of ceramic laminate veneers was described for rehabilitation of acid-eroded palatinal surfaces of maxillary posterior teeth of a 20-year-old female. Intraoral examination revealed wear facets on the palatinal surfaces of posterior teeth due to a nutrition disorder. CAD-CAM fabricated glass-ceramic veneer restorations were planned for palatinal reconstruction of maxillary posterior teeth without any tooth preparation. Intraoral optical impressions (Cerec AC Blue Cam, Sirona, Germany) of the compromised teeth were made. Veneers were modelled (Cerec 3.8 software) and milled from glass-ceramic blocks (IPS Empress CAD and IPS e.max CAD, Ivoclar, Schaan, Liechtenstein) in the CAM unit (Cerec MCXL, Sirona). Following glazing procedure, restorations were luted with a dual-curing resin cement (Variolink II, Ivoclar). Successful functional and esthetic results were achieved after a follow-up period of 6 months and the patient had no complaints.
Conclusion: Ceramic laminate veneers can be used alternatively for minimal invasive and conservative treatment of severely eroded/abraded palatal tooth surfaces, but long-term randomized controlled clinical trials are necessary for clinical outcome of this alternative ceramic laminate veneer application.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P509

Bimodal Approach in Single Implant Esthetics: A Clinical Report

Ece Şengün, Aliye Akçalı, Muharrem Erhan Çömlekoğlu, Akın Aladağ
Ege University, School of Dentistry, Department of Prosthodontics, Izmir, Turkey

Introduction: Preservation of bacteria-resisting connective tissue area and biological width around dental implants aid in prevention of bone loss. During the prosthetic stages, the biological width is being disturbed with sequential removal and insertion of the healing cap. In order to prevent this, a zirconia abutment at the time of implant placement followed by provisional crown fabrication through a bimodal clinical approach has been described in this clinical report.

Case: A provisional restoration for the planned extraction of the maxillary right central incisor of a 51-year-old female with increased mobility due to vertical root fracture was fabricated on an obtained cast before extraction and surgery. A standard bone level implant (RC:4.1 mm, 14 mm, Straumann) was placed and after 8 weeks healing period, a prefabricated zirconia abutment was selected and adapted and the non-occluding provisional crown was luted with a composite resin (Aelite All Purpose, Bisco) on the abutment. The patient was recalled after 1 week for control. After 8 weeks, an all-ceramic crown (IPS Empress CAD Multi C14, Ivoclar Vivadent) was prepared using a CAD/CAM system (Inlab, Sirona) and luted with a dual-curing resin cement (Variolink II, Ivoclar Vivadent). The patient was followed-up for 1 year without any complaints.

Conclusion: Preservation of gingival contour through controlled and guided prosthetic restoration healing around single implants at the esthetic region with bimodal approach is a predictable clinical application, however long-term clinical studies are required for the continuum of the gained gingival and periimplantary status.

P510

3D Volumetric Evaluation of Laminate Veneer Preparations

Ali Ozan Zencircioğlu[1], Merve Türkekul[1], Burçin Vanlıoğlu[2], Yasemin Kulak Özkan[2]
[1]Marmara University, Istanbul, Turkey, [2]Department of Prosthodontics, Marmara University, Istanbul, Turkey

Objectives: The aim of this study was to evaluate the amount of removed tooth tissue for laminate veneer preparations performed by two dental students and a prosthodontist.

Methods: Laminate veneer preparations were performed at nine maxillary central incisors by two dental students (S1, S2) and a prosthodontist (P) with dimple method using same diamond burs to be in the ideal depth range of 0.4–0.6 mm. All teeth were scanned before and after preparations with 3shape visual system. The removed enamel tissue from incisal, middle and cervical 1/3 parts on buccal surfaces of teeth were measured.

Results: On the incisal third; the preparation depth was 0.35–0.50 mm for P, 0.39–0.85 mm for S1, 0.61–0.79 mm for S2. On the middle third; 0.46–0.33 mm for P, 0.61–0.85 mm for S1, 0.79–0.78 mm for S2. On cervical thirf P prepared 0.47–0.50 mm, S1; 0.57–0.70 mm, S2; 0.66–0.65 mm. Approximately removed enamel tissue from buccal surface was 0.45 mm for P, 0.61 mm for S1, 0.67 mm for S2. Removed tissue volume was measured to be 21 mm3 for P, 40 mm^3 for S1, 44 mm^3 for S2. Clinically experienced prosthodontist has removed approximately double less tooth tissue than dental students.

P511

Dental Pulp Reaction to Abutment Teeth Preparation for Fixed Prostheses

Zohra Nouira, Manel Grati, Imen Guesmi, Dalenda Hadyaoui, Belhassan Harzallah, Mounir Cherif
Department of Prosthetic Dentistry, Monastir Dental University, Monastir, Tunisia

Aim: Our Objective is to evaluate the defense potential of dental pulp in vital abutment teeth during the preparation phase in which many types of pulp aggressions may take place as well as the evaluation of preparation-related pulpitis frequency.

Material: A 14-item questionnaire containing information related to:

- Patients
- oral hygiene
- abutment teeth
- dental prostheses type
- pulp reaction to the preparation procedure

Methods:

- A 2 to 5 weeks follow-up from clinical examination to abutment teeth preparation including control of dental pulp integrity.
- Data collection.
- Coding and input using the SPSS program version 17.0
- Statistical analysis using averages to describe quantitative data and relative frequencies to describe qualitative variables.
- A descriptive study for specificities related to the patients, the periodontal environment, the abutment tooth and to the prosthodontic treatment.
- An analytic study for the different correlations such as:
  Correlation: crown height and pulp reaction.
  Correlation: Crown material and pulp reaction.

Results: This study has shown that short teeth presented pulpitis after the preparation in 84% of the cases.

The crown material and the situation of finish line compromise pulp integrity: supragingival, paragingival or intrasulcular, the percentages correspond to teeth which had been devitalized.

Conclusion: This clinical study shows effective dental pulp defense mechanism during abutment teeth preparation phase. Pulpitis occurrence frequency was noted. Precautions are needed to prevent iatrogenic pulpitis during the preparation phase. Moreover, respecting procedural recommendations is vital for the preservation of the pulp from potential aggression.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P512

The Effect of Different Surface Treatments on the Flexural Strength of Repaired Acrylic Denture Base Resin

Sedanur Turgut[1], Fatih Mehmet Korkmaz[1], Bora Bagis[2], Elif Aydogan Ayaz[1], Sabit Melih Ates[3]
[1]*Department of Prosthodontics, Faculty of Dentistry, Karadeniz Technical University, Trabzon, Turkey,* [2]*Department of Prosthodontics, Faculty of Dentistry, Izmir Katip Celebi University, Izmir, Turkey,* [3]*Department of Prosthodontics, Faculty of Dentistry, Recep Tayyip Erdoğan University, Rize, Turkey*

Objectives: This study investigated the transverse repair strength of a conventional heat- polymerized acrylic resin specimens repaired with auto-polymerizing resin after the repair surfaces were treated with different techniques.

Methods: A total of fifty rectangular specimens (65 × 10 × × 3.3 mm) (n = 10) of heat-polymerized acrylic resin (QC 20) which was repaired with auto-polymerizing resin following surface treatments: Group 1 (intact specimens as a control), Group 2 (without surface treatment), Group 3 (wetting with methyl-methacrylate), Group 4 (Er;Cr;YSGG laser application 3 W-20 Hz), Group 5 (Er;Cr;YSGG laser application 4 W-20 Hz). The flexural strength was measured by a three-point bending test using a universal testing machine with a 100 Kgf load cell in the center of repair at 5 mm/min cross-head speed. All data were analyzed using 1-way ANOVA and Tamhane test ($p < 0.05$).

Results: Group 1 (control) showed (38.65 ± 8.16 MPa) significantly highest flexural strength values than the other groups ($p < 0.05$). Group 5 (5.78 ± 2.11 MPa) demonstrated significantly lower values than group 2 (13.48 ± 5.87 MPa), Group 3 (24.08 ± 5.55 MPa), and Group 1 ($p < 0.05$). Group 4 showed higher values (15.05 ± 9.59 MPa) than Group 5, but this difference was not statistically significant ($p > 0.05$).

Conclusions: Er;Cr;YSGG laser treatment alone was not able to improve the flexural strength of the repaired acrylic resin, but wetting the repair surfaces with methyl-methacrylate may be preffable method to increase the flexural strength of denture base repairs.

P513

Value of Ultrasonic Computerized Axiography in Clinical Functional Oral Diagnosis

Florin Eugen Constantinescu[1], Marian Vladimir Constantinescu[2]
[1]*Romanian Association of Oral Rehabilitation and Posturotherapy – Roposturo,* [2]*Faculty of Dentistry, University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania*

Aim: The increase in incidence of craniomandibular disorders has stimulated dentists to develop better methods to evaluate, investigate and treat these affections. Craniomandibular disorders have become a problem for many patients who find only a low amount of pain relief in current treatments.

Materials and methods: One hundred and fifty subjects (97 female, 53 male) presented for craniomandibular disorders at the Dental Prosthetics Clinic of the Faculty of Dentistry "Carol Davila", Bucharest, Romania. Out of these, 90 had objective symptomatology and were included in the study (58 women, 65%; 32 men, 35%; age range: 17–37 years). The patients were clinically analyzed according to the "Evaluating occlusal relationships, mandibular dysfunction, and temporomandibular joint pain by palpation" protocol of Bohl C.F. and Knap F.J. The ultrasonographic examination was done using the JMA system with which we measured mouth opening capacity, protusive movements and right and left laterotrusion.

Results: After muscular palpation examining, pain was found at the following sites in our cohort: pterygoideus lateralis muscle (72 patients), temporal muscle (24 patients), pterygoideus medialis muscle (18 patients), masseter muscle (12 patients). Thirty-eight patients presented no pain.

The mean mouth opening capacity was 46.8 mm (range: 20.1–61.2 mm). Out of the 90 subjects, 54 presented a normal functioning temporomandibular articulation (36%), 22 had unilateral dysfunction (14.67%) and 14 had bilateral dysfunction (9.33%).

Conclusions: Aside from the clinical examination, computerized ultrasonographic axiography represent a valuable tool for the diagnosis of craniomandibular disorders, allowing for a modern and efficacious treatment.

P514

Inlay Retained Bridges: About A Clinical Case

Sihem Hajjaji, Nouha M'ghirbi, Mohamed Bel Waer, Hayet Hajjami, Abdellatif Boughzella
University Medical Center, Farhat Hached, Sousse, Tunisia

Introduction: Composite resin or ceramic esthetic inlays are an essential therapy in our daily practice. Their indications are accurate, and they are essentially based on the defect volume, the number of restorations to be performed, and the condition of the cavity limits.

This therapy has long been reserved for single tooth restorations. Currently, the inlays can also be used as a bridge support, and this evolution could not have been possible without the contribution of bonding.

Conclusion: In fact, knowing the available materials, being able to use them, and developing a simple, reproducible and reliable protocol ensure the treatment success.

P515

Anterior Restoration: A Multidisciplinary Challenge

Rachid El Ouali, Hicham Soualhi, Layla Assila, Amal El Yamani
Department of Fixed Protheses, Dental School, Mohammed V University, Rabat Morocco

Introduction: Prosthetics are at the crossroads of dental disciplines. In case of multidisciplinary rehabilitation prosthetics is often crowning and finishing the case.

Restoration of the anterior sector is a fastidious and tricky challenge. Indeed, they should respond to biological, mechanical, functional and aesthetic aims of the treatment. This multiplicity of objectives requires upstream from the therapeutic decision, a variety of information collect (about aesthetic, function, anatomical data) and a multidisciplinary approach.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Case: Through clinical cases, we will highlight the contribution of periodontics to ensure integration and improve the prognosis of anterior prosthetic restorations.

P516

Effect of Different Surface Treatment on Bond-Strength of Denture Base

Meral Arslan Malkoç, Nilüfer Tülin Polat, Bekir Eşer, Feyza Çivitci, Hilal Şiriner
Department of Prosthodontic Dentistry, Faculty of Dentistry, İnönü University, Malatya, Turkey

Aim: Prosthodontists may concentrate on the implantation and make a removable connection with the implants simply by fitting the female parts to the removable denture. The study was designed to evaluate the effect of different surface treatment on bond strength between denture base and two different locator abutment luting acrylics.
Materials and methods: A heat-polymerized denture base resin (Paladent; Heraus Kulzer), and two different locator abutment luting auto polymerized acrylics (Ufi Gel; Voco, Quick Up, Voco) were used. A total of 80 specimens were prepared from the denture base resin according to manufacturer instructions, and divided into eight groups of 10. Then applied with six combinations of three different surface preparation method (Ethyl acetate, Methylene chloride, Er-YAG Laser) and two locator abutment luting agents; two groups were also bonded with two luting acrylics without surface treatment as control. After 24 h of storage at 37C, the shear bond strength (MPa) of the specimens was measured in a universal testing machine. Kruskal Wallis analysis of variance and the Mann Whitney U tests were performed for the statistical analysis.
Results: Ethyl acetate application increased the bond strength between the denture base and locator abutment luting acrylic significantly ($p < 0.05$). No significant differences were detected between methylene chloride and laser treatment, compared to controls ($p > 0.05$).
Conclusion: The study revealed that surface chemical treatment with ethyl acetate improved the bond strength. The Ufi Gel with ethyl acetate surface treatment is recommended as the combination possessing the most bond strength among the other combinations.

P517

Effect of Nano-Silver Acrylic Resin Against Adhesion of Candida Albicans

Chaivut Prunkngarmpun[1], Suneeborn Kunchoun[1], Raveewan Vongpetch[1], Sukrit Ingpanjalap[1], Sopon Boonlue[2]
[1]Faculty of Dentistry, Khon Kaen University, Thailand, [2]Faculty of Sciences, Khon Kaen University, Thailand

Aim: The study was to compare mean of colony forming unit (CFU) of Candida albicans that adhere on nano-silver acrylic resin.
Methods and materials: By mixing nano-silver particle to polymer part of heat cured acrylic resin, whose incorporating dose were 0 (control), 250, 500, 750, 1000, 2500 and 5000 ppm, respectively, 10 samples per group size of 15 × 10 x 2 mm3 were made. The yeasts were grown on Sabouraud broth at 37c 180 rpm for 6 h. After that, the samples were added in test tube and continuously incubated in shaking incubator for 12 h. The grossly adherent cells of Candida albicans was removed by vibrating in sterile distilled water for 20 s. Then add the sample into test tube with new Sabouraud broth and continuously incubated in shaking incubator for 18 h. These Sabouraud broth samples were diluted and incubated in Sabouraud agar at 37c for 18 h. The colonies were counted and statistic analysis was performed by One way ANOVA at significant level = 0.05.
Results: The result show that mean of colony forming unit (CFU) of nano silver acrylic resin in control group were different significantly from 250, 1000 and 2500 ppm (p-value = 0.007 p-value = 0.030 p-value = 0.022 respectively.).
Conclusion: Even though the nano-silver act as bactericide, to mixed with acrylic resin, the concentration have to be adjusted for the suitable out come.

P518

Effect of Fiber Laser on Surface Roughness of Zirconia

Server Ünal[1], Remzi Niğiz[1], Aslıhan Üşümez[2], Zelal Seyfioğlu Polat[1], Mustafa İlhan[3]
[1]Department of Prosthodontics, Dicle University, Diyarbakır Turkey, [2]Department of Prosthodontics, Bezmi Alem Vakıf University, Istanbul, Turkey, [3]Department metallurgical and materials engineering, Marmara University, Istanbul, Turkey

Purpose: The purpose of this study was to investigate the surface roughness of zirconia after fiber laser application.
Material and methods: Five sintered zirconia discs were used. Different power and frequency of fiber laser applied to each of zirconia discs surface.

1 sample: 60 watt/40 khz
2 sample: 100 watt/80 khz
3 sample: 75 watt/80 khz
4 sample: 100 watt/20 khz
5 sample: as control

Surface roughness of the specimens of zirconia were evaluated with scanning electron microscope (SEM) analyse.
Results: Surface roughness of all samples which applied fiber laser were different than control sample. Also cracks were seen in some samples. The SEM analyse view of the sample 4 was different from all samples. On the surface of sample 4, the formation of clear pits and formation of microretentive grooves were seen.

P519

Influence of Pressing and Layering Technique on Color of Zirconia

İsa Yöndem, Daime Cengiz, Esra Talay
Selcuk University, Faculty of Dentistry, Department of Prosthodontics, Konya, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Objectives: Color matching between zirconia restoration and natural teeth is a common clinical problem. The purpose of this study was to evaluate the effects of two different application methods of veneering ceramic and liner material on the color stability of a zirconia based all ceramic system.
Methods: Forty ceramic specimens (15 × 12 x 2 mm3) were fabricated from a zirconia-based porcelain (IPS e-max ZirCAD) using an Isomet low-speed saw. The specimens were randomly divided into four groups (n = 10). Group LT, zirconia specimens were investigated with additional veneering ceramic (IPS e.max Ceram) using layering technique. Group LTL, additionally the group LT was applied to the liner material (IPS e.max ZirLiner). Group PT was designed for investigation the influence of a ceramic veneering, which was applied in pressable technique. Group PTL, additionally the group PT was applied to the liner material. Baseline and after 48 h storage in the coffee solution, color measurements of specimens were made with a colorimeter, and color differences (ΔE) were calculated. The data were analyzed with a 2-way ANOVA followed by Tukey HSD tests ($p = 0.05$).
Results: There were significant differences between the color difference values of all groups ($p < 0.05$). Group LT showed the highest ΔE values (2.66 ± 0.41), and the lowest ΔE values were recorded for PTL group (0.8 ± 0.29) ($p < 0.05$).
Conclusions: The color of a zirconia based all ceramic system is influenced by layering and pressing methods and liner material.

Theme: Dental Treatment & Restorative Dentistry: Prosthetics

P520
CAD/CAM Solution for Inclined Dental Implants
Erkan Sancaklı, Ebru Demet Çifter, Ali Balık, Meltem Özdemir Karataş, Mahmut Ömer
Department of Prosthodontics, Istanbul University, Istanbul, Turkey

Introduction: Excessive angulations of dental implants are one of the most challenging problems for the prosthodontists. Although dental implant manufacturers fabricate angulated abutments, it can be used to compensate the inclination up to 20°. Custom abutment fabrication remains to be the only solution to restore the inclined implants when patients are unwilling to deal with further surgical procedures. Custom abutments can be prepared either by casting, or by using CAD/CAM techniques.
Case: In this case report prosthetic rehabilitation of 57 years old female patient using CAD/CAM designed custom abutments is presented.

P521
Effect of Multiple Firings on Bond Strenght of Zirconia-Porcelain
Daime Cengiz, Esra Talay, İsa Yöndem
Selcuk University, Faculty of Dentistry, Department of Prosthodontics, Konya, Turkey

Objectives: Zirconia ceramics are coated with veneering ceramic to improve the aesthetics. During the veneering process material is fired usually three times. Firing cycles increase with clinical adaptation and integrity problems. The aim of this study was to evaluate the effect of multiple firings on shear bond strenght of between zirconia core and veneering ceramic.
Methods: Fifty ceramic blocks specimens (15 × 12 x 2 mm3) were cut from yttria-stabilized zirconia blocks and sintered. These specimens were veneered with 3 mm thick and 5 mm diameter IPS e.max Ceram porcelain. Specimens were divided into five groups and subgroups were fired 1, 3, 5, 7 and 10 times respectively according to manufacturer instructions of veneer ceramics which are advised by the manifacturer of zirconia core systems. Shear bond strength was performed with a testing machine at a cross head speed of 0.5 mm/min. Data were statistically analyzed using ANOVA ($p = 0.05$).
Results: Shear bond strength and SD (Mpa) for five groups were 13.97 ± 3.36; 16.25 ± 2.13; 14.86 ± 3.72; 14.03 ± 3.99; 13.4 ± 4.65 respectively. The second group had the highest bond strength and the fifth group had the lowest bond strength. There was no significant difference between the bond strengths of each of the five groups ($p = 0.466$).
Conclusions: The heat treatment associated with the veneering procedure on a zirconia core material study did not significantly affect shear bond strength.

P522
Treatment of Unilateral Cleft Lip and Palate: Case Report
Esra Talay[1], Ezgi Çavdar[2], İsa Yöndem[1]
[1]Selcuk University, Faculty of Dentistry, Department of Prosthodontics, Konya, Turkey, [2]Selcuk University, Faculty of Dentistry, Department of Periodontology, Konya, Turkey

Introduction: Cleft lip and palate are the most common congenital anomalies which causes aesthetic and functional problems. Most common difficulties are insufficient alveolar bone quality and quantity, inadequate soft tissue, and poor abutment teeth. Although cleft lip and palate patients could be reconstructed with conventional prosthesis or implant retained prosthesis, clinicians still face some difficulties in prosthetic reconstruction.
Case: In this clinical report a treatment plan of 22-years-old patient with unilateral cleft lip and palate who complained about both unaesthetic appearance by reason of tooth loss on the anterior segment of maxilla because of alveolar segments' fusion problems and functional deficiency depending on the lack of anterior teeth and occlusal dysfunction were explained. A detailed medical and dental anamnesis was obtained. Due to structure loss in the cleft area standard fixed dental prosthesis were contraindicated by the esthetic reasons and clean ability problems. Therefore preparation of the maxillary teeth for 14 unit fixed metal – ceramic prosthesis with a special bar attachment in the anterior part for removable partial prosthesis was planned. Intraoral adjustments were done and glazed metal – ceramic restoration was luted with resin cement.
Conclusions: The treatment has provided compensation of structure loss and support the soft tissue so the treatment successfully met the patient's esthetical and functional expectations.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P523

Comparison of Marginal Fit of Three-Unit FPDs Fabricated with Four Different Casting Techniques

Kemal Çavdarlı, Süha Türkaslan
Department of Prosthodontics, Suleyman Demirel University, Isparta, Turkey

Objectives: The aim of this study is to evaluate and compare the marginal fit of three-unit FDPs using four fabrication techniques, and to conclude in which area the largest misfit is present.
Methods: Firstly a stainless steel master model was produced. The first impression was made with additional silicone, and master and working models were then produced. A total of 40 three-unit FDPs were fabricated with four different production techniques: conventional casting method (CC), milled metal farbricated with CAD/CAM (MM), induction casting Co–Cr (İC), and direct laser metal sintering (LS). Each of the four groups consisted of three-unit ten FDPs. Fit of the marginal gaps was measured in a stereomicroscope, digital photos were taken at 56× magnification and then analyzed using measurement software. Statistical analyses were performed with one-way ANOVA and Tukey's test.
Results: Best results were recorded for LS groups. This group was followed by MM, İC and CC groups in order. Significant differences were present between CC and LS ($p < 0.05$). The regression analyses presented differences within the parameters: production technique, tooth size, position and measurement point ($p < 0.05$).
Conclusion: Best fit was found in the LS group followed by MM, İC and CC. In all four groups, best marginal fit in both abutments was buccal and lingual side in the deepest part of the chamfer preparation. The greatest misfit was present at contact region in all specimens.

P524

Implant-Supported Bar Overdentures Using CAD/CAM Technology and 3-D Design Software: Case Series

Bilge Gökçen Röhlig, Demet Bereket Ayvalıoğlu, İbrahim Doğan
Department of Prothesis, Istanbul University, Istanbul, Turkey

Introduction: Several techniques have been described for the successful restoration of the edentulous ridges; local anatomic conditions and patient-related factors determine the choice of treatment modality. One alternative is the implant-retained bar overdenture which is reported to be the appropriate treatment choice for patients with inadequate bone volume in the posterior maxilla and mandible. The frameworks are conventionally fabricated with the lost wax-casting technique, cast-on abutment technique, computer numerical control milling or laser sintering. Recently computer-aided design/computer-aided manufacturing (CAD/CAM) technology is being used in fabrication of the frameworks and it offers the benefits of high rigidity and precise fit to the superstructure.
Case: This report describes the fabrication of maxillary and mandibular implant-supported milled titanium bars and overdentures of three patients.

P525

Treatment of Different Prosthetic Indications with CAD/CAM

Umut Can Tuğan
Department of Prosthodontics, Faculty of Dentistry, University of Yüzüncü Yıl, Van, Turkey

Objective: Computer-aided design (CAD) and computer-aided manufacturing (CAM) have become an increasingly popular part of dentistry over the past 25 years. The technology, which is used in both the dental laboratory and the dental office, can be applied for many kind of restorations. In this study patients with different prosthetic indications which treated by using CAD/CAM Cerec4.0 system, will be presented.
Methods: The first patient conducted to our clinic with a big filling. After cavity preparation, molar tooth with only two walls remaining was vital. Its treatment was planned by using an modified onlay restoration. The second case was a inley restoration in left maxillary premolar. The third patient had a big class five cavity in his canin tooth. The tooth was filled for many times before. Cavity preparations of the patients' was done and digital impressions were taken with intraoral camera (Omnicam; Sirona). Restorations designed digitally with Cerec4.0 system. Final restorations were prepared using milling machine. So the feldspathic full ceramic restorations cemented with dual-cure resin cements.
Results: After these treatments, the restorations resulted with a high biocompatibility and aesthetic satisfaction.
Conclusion: CAD/CAM technology has achieved clinical success in marginal adaptation and aesthetic.

P526

Prosthetic Reconstruction of Cleft Lip and Palate Patient

Oya Kaymakbayraktar[1], Emrah Baca[1], Gülümser Evlioğlu[1], Ayfer Kaynar[2]
[1]*Department of Prosthodontics, Istanbul University, Istanbul, Turkey,* [2]*Department of Oral & Maxillofacial Surgery, Istanbul University, Istanbul, Turkey*

Introduction: Although patients with cleft lip and palate (CLP) are not seen regularly in general dental practice, this is a frequent congenital anomaly. The cause of CLP is unknown, but possible causes are malnutrition and irradiation during pregnancy, psychological stress, teratogenic agents, infectious agents (viruses), and inheritance. Most clefts are likely caused by multiple genetic and nongenetic factors. Prosthetic reconstruction of the anterior maxilla is important for these patients. Edentulous cleft palate patients present with restorative difficulties due to their compromised maxillary arches as well as the presence of scar tissue in their palates and lip.
Case: This paper describes the prosthetic rehabilitation of a 41 years old male patient who has applied to Istanbul University Faculty of Dentistry Department of Prosthodontics, with CLP, surgically treated CLP when he was 12.

After surgery, palatal defect was reconstructed but the scar tissue was stil extant and his maxillary lateral incisor was missing. Other teeth were missed by reason of carries and periodontal disease. In oral examination also decreased vertical dimension was noticed. Vertical dimension of occlusion was increased by temporary crowns

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

and neither TMD nor masticatory muscle pain was recorded during routine controls made 3 months time. The treatment was finished with fixed prosthesis, supported by teeth and implants.

P527

Determination of Skeletal Class in Total Edentoulism

Jadranka Bundevska, Biljana Kapusevska, Vesna Korunoska Stevkovska
Faculty of Dental Medicine, Medical University "St. Kiril i Metodij", Clinic for prosthodontics, PHO Dental clinical center Sv. Pantelejmon, Skopje, R. Macedonia

Aim and Purpose: Our aim is to determinate the skeletal class in total edentoulism during denture fabrication, by using the Steiner analysis.

Materials and methods: For this purpose we made lateral craniograms of 60 subjects, 30 from each sex.

During the analyze we used basic reference points: S; N; A and B; the SN-plane and angles: SNA and SNB, which are formed between these previously mentioned points. These reference points are used for the skeletal relation determination. From their particular values we discover the relation between the jaws and the cranial base. In the Steiner analysis, the accent is placed on the difference between SNA and SNB angles, i.e the angle ANB. If the difference is between 2o – 4o, we have I skeletal class; if the difference is larger than 4o, we have II class or distal occlusion; and if we have angle smaller than 2o, we have III class or mesial occlusion.

Results: From the analysed shots of 30 male respondents, 21 of them were classified in I class, 4 of them were classified in II class and 5 of them were classified in III class. Thirty female subjects exhibited following results: 24 were classified in class I, 3 were classified in II class and another 3 were classified in III class.

Conclusions: Using this analyse, beside of determining the skeletal class, we can make a correct treatment planing of total edentoulism by placing the tooth in the right place on the denture, based on maloclussion type.

P528

Long-Term Clinical Results with Immediate Dentures

Gordana Kovacevska[1], Biljana Koseva[2], Aleksandar Kovacevski[3]
[1]*Faculty of Dental Medicine, Medical University "St. Kiril i Metodij", Clinic for prosthodontics, PHO Dental clinical center Sv. Pantelejmon, Skopje, R. Macedonia,* [2]*Private practice, D-r Kovacevska, Skopje, R. Macedonia,* [3]*Private practice, Impacta Dental, Skopje, R. Macedonia*

Objectives: The aim of this study includes a retrospective clinical evaluation of placement different immediate dentures (ID), in the prosthetic rehabilitation.

Materials and methods: Through the cases we will show you our standing point and results acquired with adequate correction with partial and total immediate dentures, in prosthetic treatment of 48 patients, were installed between 2005 and 2011, 40 in the upper jaw and 8 in the lower jaw.

This lecture will present clinical evaluation included clinical protocols associated with each type, laboratory protocols and post-insertion care.

Results: Our results show that the most suitable approach for prosthetic rehabilitation in one visit is placement of immediate dentures. Satisfaction of the non changed appearance of our patients treated with ID shows that there are advantages of this method compared to the method of the teeth extraction, time needed for stabilization and resorption of the alveolar bone procesus.

Conclusions: Immediate dentures can be successfully used in cases where tooth extraction is indicate. For archiving maximal aesthetics, preventive and functional results, protocol for ID should be made individually for each patient.

P529

Neurophisiological Resistance of the Carriers in Alternative Dental Bridges

Biljana Kapusevska[1], Nikola Dereban[2], Jadranka Bundevska[1], Vesna Korunoska[1], Mirjana Popovska[3], Ilijana Muratovska[4]
[1]*Department of Prosthodontics, Faculty of Dentistry, University St. Cyril and Methodicus, Skopje, Macedonia,* [2]*Department of Dentofacial Orthopedics, Faculty of Dentistry, University St. Cyril and Methodicus, Skopje, Macedonia,* [3]*Department of Periodontology, Faculty of Dentistry, University St. Cyril and Methodicus, Skopje, Macedonia,* [4]*Department of Dental Patology, Faculty of Dentistry, University St. Cyril and Methodicus, Skopje, Macedonia*

Aim: The goal of the study is to show the neurophysiological resistance of the carriers in alternative dental bridges, to determine the amount of pressure on the carrier, more precisely how much mastication pressure can he withstand when it is directly on him, and how much he can withstand when it is on the pontic.

Methods and materials: We used 200 patients from our ongoing clinical work, with cantilever dental bridges. We did the measuring, by measuring the mastication pressure using an electric gnathodynamometar, individualy constructed, in a time frame of around 6 months after the permanent cementing of the dental bridges.

Results: The results showed a resistance of the carriers of 125N, and of the pontics of 85N (given as an average of all observed cases).

Conclusion: We came to the conclusion that whenever there is an indication for a cantilever dental bridge (most commonly when there is a lateral incisor missing, and there are no conditions for an implant) or shortened dental arches, when crafting a distal pontic, an alternative solution is justified in terms of functionality and reasonable durability.

P530

Survey of Prosthodontic Impression Materials and Procedures for Dentures In General Dental Practice in Istanbul, Turkey

Yılmaz Umut Aslan, Burcu Erenler, Tutku Burcu Çakır, Yasemin Özkan
Department of Prosthodontics, Faculty of Dentistry, Marmara University, Istanbul, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Purpose: The purpose of this study was to survey members of Turkish Dental Association to evaluate current impression materials and methods for denture prosthodontics in Istanbul, Turkey.
Materials and methods: An anonymous questionnaire was mailed to all 400 active TDA members in the Turkey in 2013. Data analysis was performed via frequency distribution and chi square statistics.
Results: Two hundred and eighty-five questionnaires were returned by members of the TDA (71.25% return rate). The majority of the reporting dentist use a border-molded custom tray for final impressions for complete denture prosthodontics. The most popular material for border molding was plastic modeling compound (70.17%). Variability of the materials used for final impressions was observed, with the most popular materials being condensation silicone (52.68%) for fixed dentures and Zinc oxide eugenol (61.78%) for complete dentures. Dual Phase Putty/Wash impression technique (73.26%) for fixed dentures is popular among other techniques. Statistically significant differences were found in the materials used for border molding by dentist ($p < 0.05$).
Conclusion: There was variability of the materials and techniques used for final impressions by TDA members, however, overall there was an agreement on the materials and techniques used by dentist. Using condensation silicone impression materials for fixed dentures and zinc oxide eugenol impression materials for complete dentures were observed in TDA members in Turkey.

P531

Comparison of Complete Dentures Constructed With Two Different Impression Techniques: A Case Report

Nurten Baysal, Simel Ayyıldız, Hande Yeşil
Department of Prosthodontics, Gülhane Military Medical Academy, Ankara, Turkey

Purpose: The aim of this case report was to compare the functional usage of complete dentures that were fabricated by using both conventional and neutral zone impression techniques.
Case: A 73-year-old female patient was referred to the Department of Prosthodontics with the complaint of functional disability of her mandibular complete denture. In clinical examination, the misfit of mandibular denture, phonetic problems due to the maxillary denture and vertical dimension loss was determined. There was an advanced mandibular ridge resorption and it was decided to construct two different complete dentures for the patient with different impression techniques. One of the dentures was prepared according to neutral zone impression technique and the other was produced with conventional techniques. Patient firstly used the neutral zone denture for 8 weeks. Eight weeks later, the conventional dentures were replaced with neutral zone dentures. Two weeks later the patient referred to the clinic with major complaints and stated that the neutral zone dentures were more comfortable.
Conclusion: The neutral zone technique is an alternative approach for the construction of complete dentures for advance resorption of the ridges. The technique aims to construct a denture that is shaped by muscle function and surrounding oral structures. This technique may provide a more stable and retentive complete dentures for patients that have highly atrophic ridges.

P532

Treatment of Dental Asymmetry in a TMD Patient

Emrah Baca[1], Bahar Gürpınar[1], Erkan Sancaklı[1], Ali Balık[1], Necla Aslı Koçak[2]
[1]*Department of Prosthodontics, Istanbul University, Istanbul, Turkey,* [2]*Department of Periodontology, Istanbul University, Istanbul, Turkey*

Case: A 30 year old female patient has applied to Istanbul University Faculty of Dentistry Department of Prosthodontics for her Tmj pain and dental esthetic problems. Her severe visits to other dentists and esthetic surgeons, because of mandibular deviation, asymmetry in the dental arch, correspondingly her esthetic complainings she has told to have orthognatic surgery to resolve the problem.

In intra and extra oral examination for TMD also decreased vertical dimension of occlusion has noticed. Research Diagnostic Criteria for Temporomandibular Disorders form was filled. For increasing the vertical dimension of occlusion and treatment of TMD a centric relation splint was fabricated and the patient has used it for 3 months. After 3 months no symptoms was recorded for TMD.

The treatment of asymmetry was planned by starting periodontal surgery procedures. Crown lengthening was made for right maxillary region. After routine controls and gum healing metal fused to porcelain crowns was decided depending on the patient's choice.
Conclusion: Asymmetry problem was solved with fixed prosthodontics and the treatment was finished by receiving the approval of the patient. Routine controls for each 6 months was suggested.

P533

The Comparison of the Precision of Different Dental Radiographic Methods in Mandibular Periimplantary Measurements: An In Vitro Pilot Study

Zeynep Yılmazcan[1], S. Arat[2], Hakan Bilhan[1], F. Unalan[1], Onur Geçkili[1]
[1]*Department of Prosthodontics, University of Istanbul, Faculty of Dentistry, Istanbul, Turkey,* [2]*Department of Prosthodontics, Medipol Mega Hospital and University, Istanbul, Turkey*

Purpose: The aim of this in vitro study was to investigate and compare the precision of several radiodiagnostic methods used in dentistry for the measurement of periimplantary sites.
Materials and methods: Six dental implants were placed in a human cadaver mandible. Periapical radiographs obtained with the parallel as well as the bisecting angle technique, digital and conventional panoramic radiographs were used for implant and periimplant bone measurements. The measurement results at each implant were statistically analyzed.
Results: The ICC values for the inter-observer reliability were 0.79 for implant diameters and 0.96 for implant lengths. Statistical significance was not detected between the differences of the measurements of the two examiners from the original implant dimensions related to anatomic locations. For both of the examiner measurements, significantly less difference from the original implant dimensions was detected in the parallel technique compared to the other techniques ($p < 0.05$).

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Conclusions: The present study showed that the most precise periimplant bone measurements can be obtained from periapical radiographies obtained by the parallel technique.

P534

Evaluating the Effects of Different Surface Treatments and Different Resin Luting Agents in the Zirconia Post System which Produced by CAD/CAM for Retantion

Derya Toprak Gündüz[1], Zelal Seyfioğlu Polat[2], Filiz Keyf[3]
[1]Department of Prosthodontics, Oral and Dental Health Center, Mardin, Turkey, [2]Department of Prosthodontics, Dicle University, Diyarbakır, Turkey, [3]Department of Prosthodontics, Hacettepe University, Ankara, Turkey

Aim: This study investigated the effect of surface treatments of the retentive strength of zirconia posts which had been produced by Computed Aided Design/Computer Aided Manufacturing (CAD/CAM) technique to root canals.

Methods and materials: Maxillary central incisors (n = 120) were obtained and assigned randomly to 12 groups (n = 10 per group).

Three different type of surface roughness.

1 Hydrofloric acid,
2 Al2O3 partical abrasion,
3 CoJet silica coating system (and 3 control groups) were applied to the posts surfaces and the posts were cemented adhesively with 3 different adhesive luting
a MDP contain cement,
b Bis-GMA Based Resin,
c Adhesive Resin Based cements

To the prepared sample, at the Instron Testing Machine by the help of appropriate equipment the tensile tests evaluated.

Results: All treatment methods increased the tensile strength of zirconia posts compared to the control group ($p < 0.005$). In the surface treatment techniques Al2O3 partical abrasion (129.17N) and CoJet silica coating technique (108.03 N) were finding effective and in the adhesive cement, which is contain MDP was finding most effective ($p < 0.005$).

P535

Missing Anterior Tooth Rehabilation by Porcelain Fixed Denture in Adolescense

Tuba Orhan[1], Tuba Talo Yıldırım[2], Filiz Acun Kaya[3], Diyadin Doğan[1]
[1]Diyarbakir Mouth and Tooth Health Center, Diyarbakir, Turkey, [2]Department of periodontology Clinic, Diyarbakir Mouth and Tooth Health Center, Diyarbakir, Turkey, [3]Department of periodontology Clinic, Dicle University, Diyarbakir, Turkey

Introduction: The lost of anterior tooth can be depressing to the patient both psycologically and socially in adolosencent patients. Temporary replacement of the tooth can minimize these concerns. Many approaches have been described for this temporary replacement. This article presents an alternative approach for oral rehabilation of the pre adolescent female who has lost anterior central tooth in early age.

Case: 12 years old girl applied to clinic with missing central tooth on maxilla. She was unhappy due to her appearence. She was young for implant or fixed porcelain dentures. And patient did not want to use a removable partial denture. In her anamnesis she lost her tooth after traumva. We planned a temporary metal reinforced porcelain denture including pontic and only supports from neighbour teeth's singulums. We cemented denture. As a result she was happy with her new appearance.

P536

Evaluating the Compressive-Shear Bond Strength of Different Surface Roughness of Zirconia Post System that has Luted with Different Luting Agents

Derya Toprak Gündüz[1], Zelal Seyfioğlu Polat[2], Filiz Keyf[3]
[1]Department of Prosthodontics, Oral and Dental Health Center, Mardin, Turkey, [2]Department of Prosthodontics, Dicle University, Diyarbakır, Turkey, [3]Department of Prosthodontics, Hacettepe University, Ankara, Turkey

Aim: His study was going to examined as the effect of resistance and fracture types of zirconia posts that have three different typed of surface roughness and then which were luted with three different adhesive luting cements.

Methods and materials: Maxillary central incisors (n = 120) were obtained and assigned randomly to 12 groups (n = 10 per group). The post spaces were prepared into the root canals and 120 directly fabricated acrylic resin posts and core patterns were obtained. The 120 resin post and core core patterns were transferred to a dental laboratory to be dublicated to zirconia post and core foundations with the use of CAD-CAM technique. Obtained zirconia post and core speciments were assigned to 12 experimental groups (three control groups) (n = 10).

Three different surface treatments methods

1 Hydrofloric acid ethcing,
2 Al2O3 partical abrasion,
3 CoJet silica coating system were used to make surface roughness of the posts.

And then posts were luted with the use of three adhesive luting agents

a MDP contain cement,
b Bis-GMA Based Resin,
c Adhesive Resin Based cements.

To the prepared sample, at the Instron Testing Machine by the help of appropriate equipment the compressive-shear tests evaluated. The results were examined with ANOVA and also with Tukey HSD and Dunnett t tests ($p < 0.005$).

Results: There were no significally differences were found for the compressive-shear strength ($p < 0.005$). And also the fracture types were examined mechanically and with ARI and BRI index. The fracture type were classified into the four types. The most seen fracture types were the 1/3 cervikal third vertically fracture types.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P537

The Effect of Different Sprue Designs on the Internal Porosity of Cast Titanium Crowns

Reza Darabi

Department of Prosthodontics, School of Dentistry, Isfahan Azad University, Isfahan, Iran

Statement of Problem: Porosity is a frequently observed casting defect in titanium dental casting.

Purpose: This study measured the effects of different sprue design on the internal porosity of cast titanium alloy crowns.

Methods and materials: Sixty complete veneer crowns were fabricated on a stainless steel die with a 150 – degree sloping shoulder using customized wax patterns.

All wax patterns were sprued with three different sprue designs (Reservoir, Runner bar and Rousseau) and were invested with an alumina – magnesia investment. Castings were made with commercially pure titanium [cp Ti (grade II)] according to the manufacturer's instructions. The castings were carefully cleaned. Internal porosities were quantified with photographs and radiographs by computerized image analyses. Data were analyzed with an ANOVA with a confidence level of 95%.

Results: There were statistically significant differences in the values of porosity between 3 types of sprue designs. The Reservoir sprue design had the least internal porosity comparing to the other designs.

Conclusions: Improvements in the porosity of titanium crowns was the result of the Reservoir sprue design with vent. Effects of different sprue designs on internal porosity and their effects on casting accuracy and marginal adaptation of cast titanium crown and bridges must be evaluated to achieve better evidence and clinical relevance.

Key words: Titanium, Sprue design, internal porosity.

P538

Dental Implant-Retained Mandibular Overdenture in A Child With Ectodermal Dysplasia

Serdar Kılıç[1], Subutay Han Altıntaş[1], Nuray Altıntaş[2], Özkan Özkaynak[3], Adem Kuşgöz[4], Mehmet Bayram[5]

[1]Department of Prosthodontics, Faculty of Dentistry, Karadeniz Technical University, Trabzon, Turkey, [2]Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Karadeniz Technical University, Trabzon, Turkey, [3]Private Practice, Antalya, Turkey, [4]Department of Pediatric Dentistry, Faculty of Dentistry, Karadeniz Technical University, Trabzon, Turkey, [5]Department of Orthodontics, Faculty of Dentistry, Karadeniz Technical University, Trabzon, Turkey

Introduction: Ectodermal dysplasias are relatively rare and are characterized by the abnormal development of embryonic ectoderm derivatives such as hair, nails, teeth, and skin. The objective of this case report was to present the prosthetic rehabilitation of a 6-years old growing child with hypohidrotic ectodermal dysplasia after placement of two mini endosseous implants in anterior mandible and to introduce clinical effectiveness of this prosthetic procedures after 4-years follow up.

Case: A 6-years old boy with ectodermal dysplasia have maxillary oligodontia and mandibular anodontia with undevelopment of alveolar processes. The treatment option considered for this child included constructing implant retained removable denture in mandible and removable partial denture in maxilla supported by first molars. Evaluation of post- treatment cephalograms revealed facial growth during the 15-months period and the same prosthetic procedures have been renewed for two times in the following 4 years. Satisfying functional and esthetic results have been achieved and no problem has been detected related with mini implants and growth pattern within the 4 years follow-up period.

Conclusion: The placement of implants in anterior mandibula region also seems to be a promising approach. Because of less vertical bone growth in this region, implant placement does not adversly effect the transverse mandibular growth. The placement of implants facilitated patient to accept and handle with the removable denture easily. Treatment option in this patient is considered to be a proper method and this further motivates the child patient psychologically during the growing period because of satisfying function and esthetic.

Theme: General Dentistry and Oral Health

P539

Objective Understanding of Emotional Changes Induced by Viewing Dental Treatments

Taki Sekiya[1], Zenzo Miwa[1], Natsumi Tsuchihashi[2], Kumiko Sugimoto[2]

[1]Pediatric Dentistry, Department of Oral Health Sciences, Division of Medical and Dental Sciences Graduate School, Tokyo Medical and Dental University, Tokyo, Japan, [2]Basic Oral Health Science, School of Oral Health Care Sciences, Faculty of Dentistry, Tokyo Medical and Dental University, Tokyo, Japan

Aim: Since the understanding of emotional changes induced by dental treatments is important for dentists to provide a safe and comfortable dental treatment, we analyzed electroencephalogram (EEG), electrocardiogram (ECG) and facial electromyogram (EMG) during watching video images of dental treatments to search for the best objective indices reflecting emotional changes.

Materials and methods: Fourteen healthy subjects (six males and eight females) with the mean age of 22.6 ± 3.2 (SD) years voluntarily participated in the present study. EEG, ECG and EMG of the corrugator muscle was recorded during watching video images of intra-oral examination, infiltration anesthesia and cavity excavation. By analyzing EEG and ECG, the emotional changes and autonomic nervous activities were estimated, respectively. The subjective discomfort level was acquired by Visual Analog Scale method. This study was approved by the Ethics Committee of our university.

Results: Analysis of EEG and ECG demonstrated that watching the image of infiltration anesthesia and cavity excavation induced a lowering of relaxation level and an increase in sympathetic nervous activity which elevates with mental stress. The peak activity of corrugator muscle was increased by watching all examined images. The subjective discomfort level was highest during watching infiltration anesthesia image.

Conclusion: These results suggest that subjective discomfort can be seized to some extent by analyzing EEG, ECG and EMG, but the close relationship between subjective feelings and these indices has not been obtained yet. Further investigation is required to find the

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

most suitable index to understand the emotional states of patients during dental treatments.

P540

Salivary Histatin Levels and Fungal Colonisation in Down Syndrome

Tomoko Komatsu[1], Hidefumi Kumada[2], Eva J Helmerhorst[3], Salih Erdjan[3], Frank G. Oppenheim[3], Nobushiro Hamada[2], Chang Il Lee[4]

[1]Division of Dentistry for the Special Patient, Department of Clinical Care Medicine, Kanagawa Dental University, Yokosuka, Japan, [2]Division of Microbiology and Immunology Department of Infection Control, Kanagawa Dental University, Yokosuka, Japan, [3]Department of Periodontology and Oral Biology, Boston University, Henry M. Goldman School of Dental Medicine, Boston, MA, USA, [4]Division of Pharmacology, Department of Clinical Care Medicine, Kanagawa Dental University, Yokosuka, Japan

Aim: Histatin 5 is a small molecular weight salivary protein that has been shown to possess antifungal activity against *C. albicans*. We investigated the relationship between concentrations of salivary histatin 5 and the oral fungal colonization in the twelve young individuals with Down syndrome (DS) (mean of age 8.4 ± 0.5) and age- and gender-matched healthy controls (HC).
Materials and methods: Whole saliva samples were used to determine the concentrations of histatin 5 by the Human histatin 5 enzyme-linked immunosorbent assay kit®. Microbiological samples were collected from the dorsal surface of the tongue, and cultured on CHROMagar® medium and blood medium to evaluate the carriage of species of Candida and oral bacteria, respectively.
Results: Sixty seven percent of DS and 17% of HC had positive fungal culture and the species of *C. albicans* were only found in both of them. The mean number of both *C. albicans* and total oral bacteria in DS also significant higher compared to the HC. Mean of histatin 5 levels were significantly lower (523.72 ± 338.43 ng/ml) for the DS compared to HC (1017.01 ± 492.31 ng/ml; $p < 0.01$).
Conclusions: The data from this study suggested that the level of the colonization of *C. albicans* was significantly higher in DS individuals, whereas the concentration of histain 5 was significantly lower. From these results, it would be likely contributing to the enhanced predisposition of DS of oral candidiasis due to reducing histatin 5 such as salivary antifungal protein.

P541

Orofacial Features of Treacher Collins Syndrome

Eno Gace

Department of Dentistry, Albanian University, Tirana, Albania

Introduction: Treacher Collins Syndrome is a rare autosomal dominant disorder of cranio facial development. Major features include mid face hypaplasia, micrognathia, microtia, conductive hearing loss and cleft palate. The present case report describe a 6 years old male with TCS with several extra and intraoral findings such as: mid face hypoplasia, zygomatic bone hypoplasia, anti mongoloid slant of palpebral fissures, mandibular rethrognatia and mandibular disostosis, conductive hearing loss, high incidence of caries, lips incontinence, oral breath and speech difficulty.
Methods and Materials: Management strategies and behavioral approaches of patients with TCS from dental perspective will be discussed.

P542

Intraoral Radiographic Errors on Photostimulable Phosphor Plates (PSP) Taken by Dental Students

Asım Dumlu, Gizem Kızılyel, Mehmet Oğuz Borahan

Department of Dentomaxillofacial Radiology, Faculty of Dentistry, Marmara University, Istanbul, Turkey

Objective: The objective of this study was to assess the technical errors of intraoral radiographs on photostimulable phosphor plates (PSP) taken by dental students who were introduced dental radiology practise for the first time.
Methods: One hundred and seven dental students attending preclinical radiology training with a mandatory 3 h per week teorical lectures and practical radiology training before clinical practise, were asked to perform six periapical radiographies (maxillary/mandibular molars, premolars, incisors) with the bisecting angle projection technique using PSP (Soredex, DIGORA Optime). All of the images were exposed on the same X-ray training model with finger fixed to phantom head (Morita P27-XR.2 + AM-90D) by dental radiography device (New Life Radiology SRL, Italy) with the same imaging parameters (70 kV, 8 mA). Six hundred and forty-two intraoral radiographies were evaluated by three observers for technical errors including; missing the apices/crowns of teeth, cone-cut, overlapping of contact points, foreshortening, elongation, reversed image, double image, wrong placement of radiograph. The percentages of errors were calculated.
Results: The most frequent error seen in this study was elongation (%29). Respectively the others were; missing apices of teeth (% 25.3), overlapping of contact points (%20), missing crowns of teeth (%16.9), cone-cut (%12.3), foreshortening (%3.8), wrong placement of film (%2.49), reversed image (%0.4), double image (%0.2).
Conclusions: Our results show that students had difficulties in placing the film and adjusting the angulation of tube head so practical training time should be satisfactory for students to learn how to take accurate radiographs. Formal curriculum should be revised to prevent these errors and improve our teaching skills.

P543

Oral Health and Menopause: Investigation on Salivary Secretion and Components

Kumiko Sugimoto[1], Naomi Yoshida[2], Satoe Suzuki[3], Hideki Kudo[3]

[1]Basic Oral Health Science, School of Oral Health Care Sciences, Faculty of Dentistry, Tokyo Medical and Dental University, Tokyo, Japan, [2]Department of Dental Hygiene, Faculty of Health Sciences, Chiba Prefectural University of Health Sciences, Chiba, Japan, [3]Department of Clinical Laboratory Medicine, Faculty of Health Science Technology, Bunkyo Gakuin University, Tokyo, Japan

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: The purpose of this study is to clarify whether salivary secretion and components are influenced by menopausal state, since it is generally recognized that women in menopause tend to suffer from oral health problem such as xerostomia.
Materials and methods: One hundred and eleven female dental hygienists aged 40–59 years voluntarily participated in this study and the unstimulated saliva and blood was collected from them. Fourteen subjects with hysterectomy and diseases such as hyperpiesia and diabetes were excluded from the analysis. The subjects were divided into three groups of pre-menopause, menopause and post-menopause, based on menstrual states. Salivary secretion rate and concentrations of several salivary components and serum estradiol were measured, and those relationships with menopausal states were analyzed. This study was approved by the Ethical Committee of our universities.
Results: The serum estradiol concentration of pre-menopausal group was significantly higher than the other groups. The salivary secretion rate was higher in pre-menopausal group compared with post-menopausal group and correlated with serum estradiol concentration. No differences between three groups were observed in the components of saliva such as antioxidant and secretory IgA. The salivary amylase activity which is regarded to elevate with internal stress tended to negatively correlate with estradiol concentration.
Conclusions: These results suggest that decrease of serum estradiol may result in decrease in salivary flow which may in turn cause problems of oral health at menopause. Furthermore, the tendency of negative correlation between estradiol and salivary amylase levels suggests the association between estradiol level and internal stress.

P544

Dental Health Attitudes and Behaviour of Dental Students

Anıl Alnıak[1], Başak Doğan[2]
[1]*Department of Periodontology, Yeni Yüzyıl University, Istanbul, Turkey,* [2]*Department of Periodontology, Marmara University, Istanbul, Turkey*

Aim: To compare the oral health behaviour and attitudes among the preclinical and the clinical dental students in Marmara University.
Materials and methods: Five hundred and thirty-eight dental students were surveyed by using a Turkish version of Hiroshima University-Dental Behavioural Inventory (HU-DBI). The study design was approved by the Faculty of Medicine, Istanbul University (14102009-03).
Results: The mean HU-DBI score of all students was 6.37 ± 1.81 while the mean HU-DBI score of the clinical students (7.19 ± 1.54) was significantly higher than the preclinical students (5.32 ± 1.59) ($p = 0.000$). The percentage of the preclinical students who have used a dye to see how clean their teeth are, who brush each of teeth carefully and who thinks that they can clean their teeth without toothpaste was significantly lower than the clinical students ($p < 0.001$). Significantly higher ($p < 0.05$) percentage of the preclinical students, compared to the clinical students, use a hard bristles toothbrush, brush with strong strokes, worry about bad breath and colour of their teeth and gums, put off going to dentist until they have a toothache; agree on that their gums tend to bleed while brushing; think that their teeth are getting worse despite daily brushing, tooth brushing alone don't prevent gum disease, and they can not help having false teeth when they are old.
Conclusions: The oral health attitudes and behavior of dental students improved with the increasing level of education. Preventive dentistry courses should be taught in the beginning of the dental curriculum of the preclinical years.

P545

Oral Health Conditions of Brazilian Schoolchildren

Sandra Maria Ferraz Mello, Danilo Barral Araújo, Roberto Paulo CorreiaDe Araújo
Institute of Health Sciences, Federal University of Bahia, Brazil

The epidemiological survey of oral health found by SB Brazil 2010 pointed to a reduction in DMFT 2.8 (2003) to 2.1 (2010), at 12 years of age.
Objective: To determine the oral health status of schoolchildren, aged 7–12 years, in Bahia, Brazil, in order to identify carriers of sickle cell anemia.
Methods: Cross-sectional, descriptive and comparative analytical approved by the Ethics Committee of the Maternity Climério de Oliveira, UFBA, No. 111/09. The sample consisted of 350 children of both sexes. Were added to the instruments used for oral health epidemiological investigations recommended by WHO (1997) examination of Hb electrophoresis to detect sickle cell anemia and quality assessment tests to salivate.
Results: 72.5% of the sample had mixed dentition and 56.3% had caries experience. The dmft and DMFT were 1.45 and 0.53, respectively, and 38.3% children had white spots on dental units and of these 38.3% were of fluorosis. 58.95% had normal salivary flow. The DAI showed 77.2% children with malocclusion. 84.3% have already made a visit to the dentist and 75.7% reported brushing their teeth twice or more a day. We did not identify any children with sickle cell anemia.
Conclusion: Conclusion: The oral health of schoolchildren showed an acceptable standard, indicating the need for orthodontic intervention and there were no children with sickle cell anemia in the sample suggesting the investigation of infant mortality, being a city with a predominantly black population.

P546

Oral Health Attitudes and Behavior Among Patients in a Dental Hospital in Ankara, Turkey

Gökçe Soğancı[1], Nuran Özyemişci Cebeci[2]
[1]*Topraklık Mouth and Dental Health Centre,* [2]*Hacettepe University Polatlı Vocational School of Health Services*

Introduction: The aim of this study was to have a foresight about oral health behavior among patients who visit one of dental hospitals in Ankara.
Materials and methods: Questionnaire was prepared using Turkish version of Hiroshima University Dental Behavioural Inventory (HU-DBI) and additonal seven questions. Two hundred and fifty-eight number of patients participated. Edentulous patients were

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

kept out of the study. Data were statistically analyzed by Pearson's Chi-Square tests.

Results: Of 258 patients responded, 134 was female and 124 was male. The average age of the patients was 32.8. 13.2% of the patients was graduated from primary school, 14.3% secondary school, 33.3% high school, 4.3% open university, 31.8% university, 3.1% post graduate. Correlation between oral health behavior and different age groups, gender, education was studied. There was significantly difference between variant age groups and to worry about wearing dentures in old age, to be taught toothbrushing, to clean teeth well without toothpaste, to be told that they had brushed their teeth very well by a dentist (p 0.05). There was significantly difference between gender and to worry about visiting the dentist, to get worse of teeth despite daily brushing, to brush each teeth carefully (p 0.05). There was significantly difference between educational level and to brush each teeth carefully, to be taught toothbrushing, to use a dye to see how clean the teeth are, to brush before going to bed, to take medicine before visiting dentist, to floss teeth (p 0.05).

P547

Endocrown: A Clinical Case

Anissa Ben Moussa, Imen Guesmi, Zohra Nouira, Amina Khiari, Jilani Saafi, Belhassen Harzallah, Mounir Cherif
department of prothesis dendistry, dentistry university, monastir, tunisia

Objective: The goal of this work is to use an alternative to full-coverage crowns with a root canal anchorage, making it possible to have a good aesthetic and functional results while preserving the biomechanical integrity of the posterior teeth keeping an excellent retention.

Clinical case presentation: A 23-year-old patient presented to the fixed prosthodontics department requesting a crown restoration of the first mandibular molar.

Intra-oral examination revealed an unesthetic and voluminous occlusal amalgam. The molar was devitalized. The endodontic treatment was satisfactory. After removal of the amalgam, a gross intracoronal cavity with supra-gingival walls was disclosed.

The prosthetic decision was to design a ceramic endocrown using CAD/CAM.

Conclusion: The endocrowns can be regarded as an alternative to the full-coverage crowns for the restoration of the endodontically treated posterior teeth mainly those with insufficient coronary height and with sufficient tissue available to allow a stable and durable bonding.

P548

Cental Odontogenic Fibroma – Case report

Pedro Mesquita[1], Jaime Portugal[2], Helena Salgado[1]
[1]*Departamento de Anatomia e Histologia Dentária, Faculdade de Medicina Dentária da Universidade do Porto, Porto, Portugal,*
[2]*Departamento de Biomateriais da Faculdade de Medicina Dentária da Universidade de Lisboa, Lisboa, Portugal*

Introduction: Central odontogenic fibroma (CFO) is a benign odontogenic tumour derived from the dental mesenchymal tissues. It is an uncommon pathology that could be found in all age-groups, and in both the mandible and the maxilla. In the maxilla, this lesion mainly involves the anterior region, whereas in the mandible, the lesion tends to be located in the posterior area. Radiologically, it presents as a well defined unilocular or multilocular radiolucency. CFO usually develops asymptomatically. However, larger and more severe lesions may be associated to root resorption and/or displacement of the neighbouring teeth. Treatment involves surgical enucleation as well as follow-up of the patient.

Case: A 24-year-old caucasian male patient was referred, reporting a pressure on the left side of the upper jaw. There were no other symptoms and no recent history of pain. Clinical examination did not reveal buccal or palatal expansion but left maxillary second premolar was with mobility. Radiographic evaluation showed the presence of a unilocular radiolucent well-defined area involving the roots of the maxillary left canine, first and second premolars. After endodontic treatment of involved teeth (23, 24, 25), the lesion was surgically removed under general anaesthesia. The histopathological diagnosis confirms a central odontogenic fibroma. The patient showed no clinical or radiographic signs of recurrence 1 year after surgical excision.

Conclusion: Rarity of this tumour excludes it from most differential diagnosis, and when diagnosed, it is an unexpected finding. It is important that health care professionals have in mind this lesion when diagnosing odontogenic tumors.

P549

Tooth Agenesis: Is There More Than Missing Teeth?

Spiridon Silvestros[1], Heleni Vastardis[2], Athanasios Armakolas[3], Michael Koutsilieris[3]
[1]*Department of Prosthetics, School of Dentistry, National and Kapodistrian University of Athens, Athens, Greece,*
[2]*Department of Oral Biology, School of Dentistry, National and Kapodistrian University of Athens, Athens, Greece,*
[3]*Department of Experimental Physiology, Medical School, National and Kapodistrian University of Athens, Athens, Greece*

Introduction: Tooth agenesis is the most common developmental anomaly of the human dentition. It occurs as part of a genetic syndrome or as an isolated sporadic or familial finding. The genetic basis of familial tooth agenesis has been established through the identification of mutations in the MSX1, PAX9 and AXIN2 genes. Two of them (MSX1, PAX9) seem to be critical for premolar and molar development whereas, AXIN2 is associated with a less tooth-specific agenesis type but with predisposition to colorectal cancer. Given this association it would be most helpful to use tooth agenesis as a phenotypic marker for the development of colorectal cancer.

The aim of our study is to investigate the genetics of tooth agenesis in a Greek population, and to estimate the incidence of AXIN2 mutations and their association to colorectal cancer.

Materials and methods: Following approval from the Institution Ethics Committee, 150 tooth agenesis patients of Greek descent participated to sequence analyses of the regions containing known MSX1, PAX9 and AXIN2 mutations as previously described. Seventy-five colorectal cancer patients were also screened for the same mutations.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Results: We have identified four novel mutations in the MSX1 and PAX9 genes which are expected to create considerable changes in the structure and function of the relevant proteins and 3 AXIN2 polymorphisms in our Greek sample. These three polymorphisms are present in both tooth agenesis and colorectal cancer patients.
Conclusion: Further work should define the association of the novel genetic defects to the two phenotypes (tooth agenesis and colorectal cancer).

P550
Wiskott–Aldrich Syndrome: A Case Report
Mustafa Aydınbelge[1], Salih Doğan[1], Gamze Gündüz[1], Ekrem Ünal[2], Türkan Patıroğlu[2]
[1]Department of Pediatric Dentistry, Erciyes University, Kayseri, Turkey, [2]Department of Pediatrics, Division of Pediatric Hematology and Oncology, Erciyes University, Kayseri, Turkey

Introduction: Wiskott Aldrich syndrome (WAS) was first described by Alfred Wiskott in 1937 as a triad of discharging ears, eczema, and thrombocytopenia. In 1954 the syndrome was rediscovered by Robert Aldrich. He demonstrated an X-linked mode of inheritance in a family with 16 affected males within six generations.

WAS is a severe X-linked Primary Immunodeficiency characterized by thrombocytopenia with microplatelets, eczema, recurrent infections, and predisposition to autoimmune disease and malignancy. It is a rare syndrome, and the incidence rate is approximately 4 in every 1 million live male births with no clear ethnic or racial predilection.

The features associated with WAS include dysfunction of nearly all effector arms of the immunity, as well as thrombocytopenia with platelet dysfunction. As a consequence of these abnormalities, children and adults with this syndrome have recurrent bleeding, recurrent and significant infection with common opportunistic organisms, autoimmune diseases, and lymphoreticular malignancies. Autoimmune diseases affect from 22% to 72% of WAS patients and the most common manifestation is autoimmune hemolytic anemia, followed by vasculitis, arthritis, neutropenia, inflammatory bowel disease, and IgA nephropathy.
Case: The purpose of this case presantation is to report a case of Wiskott Aldrich syndrome with oral involvement demonstrated by 4 years old boy patient.

P551
Biological Interactions of Plasma Needle for Dentistry
Zethy Hanum Kassim[1], Jamie Harle[2], Vehid Salih[3], Ailbhe Mcdonald[3]
[1]Center of Studies for Restorative Dentistry, Universiti Teknologi MARA, Selangor, Malaysia, [2]Department of Physics, University of Liverpool, Liverpool, UK, [3]Eastman Dental Institute, University College London, London, UK

Aim: Prohibitive aspect of plasmas for dental treatment comes from ROS (reactive oxygen species) or changes of saliva pH, which may cause local damage in the environment around the plasma away from the site of treatment. This study aimed to investigate these biological interactions by considering plasma-cell contact and plasma-treated medium contact at varying plasma operation parameters.
Materials and methods: AlamarBlue® assay was performed to assess proliferation of cells Human osteoblast cells (MG63) and human gingival fibroblast cells (HGF) following plasma treatment. The effects of plasma helium flow rate and duration of exposure on the cells were compared using a two-way analysis of variance (ANOVA). Both MG63 and HGF cells subjected to direct and indirect plasma treatment were also assessed qualitatively using scanning electron microscope (SEM).
Results: Indirect exposure to plasma led to some cell death. Scanning electron microscopic (SEM) images, showed that direct plasma exposure within the operating parameters led to total cell death. MG63 cells were significantly affected by duration of exposure whilst HGF cells were significantly affected by plasma gas flow rate.
Conclusion: The plasma needle used in this study requires further calibration and optimisation as well as in vitro testing before any considerations of primary in vivo animal testing can be done in view of future use for dental treatment.

P552
Effects of Odor of Arborous Essential Oil on Saliva and Relaxation
Yoko Kono[1], Aya Yamagami[1], Koji Shibuya[2], Kumiko Sugimoto[2]
[1]Cognitive Neurobiology, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Tokyo, Japan, [2]School of Oral Health Care Sciences, Faculty of Dentistry, Tokyo Medical and Dental University, Tokyo, Japan

Aim: Since arborous essential oils are known to induce mental relaxation, we investigated the effects of essential oil of himekuromoji (Lindera umbellata var. lancea), one of popular arborous aroma in Japan, on saliva and autonomic nervous activities.
Methods: Nineteen healthy volunteers aged 26.1 ± 4.5 years (the mean ± SD) smelled himekurmoji for 5 min through a mask attached to the smell bag filled with vapor of the essential oil. The saliva was collected for 3–5 min before and right after smelling himekuromoji. The weight of saliva was measured immediately after collection. The concentrations of secretory immunoglobulin A (sIgA), the dominant substance of mucosal immune activity, and antioxidant capacity in collected saliva were measured using the respective assay kit. In addition, salivary α-amylase activity that is known to increase with internal stress was measured before and after smelling. Throughout the experiment, the electrocardiogram was recorded to estimate autonomic nervous activities through power spectral analysis. This study was approved by the Ethical Committee of our university.
Results: The salivary flow rate tended to increase and the concentration of sIgA significantly increased after smelling himekuromoji. However, salivary α-amylase activity and antioxidant capacity were not influenced. During smelling, parasympathetic nervous activity significantly elevated with accompanying a reduction of sympathetic nervous activity.
Conclusion: This study demonstrated that smelling of himekuromoji induced increase in salivary sIgA concentration and

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

elevation of parasympathetic nervous activities with reduction of sympathetic nervous activities, suggesting that himekuromoji may be effective for improvement of oral immunity and enhancement of relaxation.

P553

Oral Health of Children with Blood Disorders and Childhood Cancers

Lily Azura Shoaib[1], Syarida Hasnur Safii[2], Rossita Mohamad Yunus[3], Farinawati Yazid[1], Zeefitri Saniah Bidin[1], Halimah Awang[1]
[1]*Department of Children Dentistry and Orthodontics, Faculty of Dentistry University of Malaya, Kuala Lumpur, Malaysia,* [2]*Department of Oral Pathology & Oral Medicine & Periodontology Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia,* [3]*Institute of Mathematical Sciences, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia*

Aim: To determine oral health status and examine the association between dental disease prevalence and patients' medical conditions.
Methods: Upon ethical approval, dental clinical records of paediatric oncology ward patients were retrieved; incomplete records were excluded. Demographic information and medical diagnosis of subjects were compiled. Clinical findings, carried out using (i) Simplified Oral Hygiene Index (OHI-S), (ii) Gingival Index (GI), decayed, missing and filled teeth (dmft) index and Decayed, Missing and Filled Teeth (DMFT) index were recorded as well as complaints related to oral symptoms.
Results: Subjects (N = 321; 197 male and 104 female) comprised primary dentition age group (n = 146, 48.5%), mixed dentition age group (n = 96, 31.5%) and permanent dentition age group (n = 59, 19.6%). Ethnicity-wise, 51.2% were Malays, 41.2% Chinese, 6.6% Indians and 1.0% others.

Leukaemia, red cell disorder, other blood disorders and miscellaneous tumours were diagnosed in 49.2%, 10.3% and 40.5% of the subjects, respectively. All subjects were at different stages of disease upon examination.

Prevalence of gingivitis was low in leukaemia (10%), red cell disorder (7%) and other tumours groups (18%), however it was higher in other blood disorders group (33%) and miscellaneous tumours (40%).

For oral health status category, the odds ratio for caries prevalence with poor OH was 7.12 (95% CI 2.33–21.64, $p < 0.05$). The association between gingivitis and caries prevalence was found to be not statistically significant ($p > 0.05$).
Conclusion: Young patients with blood disorder and childhood cancers appear to be more at risk of dental caries in spite of relatively low prevalence of gingivitis.

P554

Relationship Between Gastroesophageal Reflux Disease and Dental Erosion

Fatma Aytaç[1], Engin Ersöz[2]
[1]*Department of Restorative Dentistry, Gaziosmanpasa University, Tokat, Turkey,* [2]*Department of Restorative Dentistry, Ankara University, Ankara, Turkey*

Aim: The aim of this study was to investigate the casual relationship between gastroesophageal reflux disease and dental erosion.
Methods: The research was performed with two working groups consisting of the total of 100 people between the ages of 16 and 65. Ethics committee approval was received. Fifty individuals who described symptoms of reflux at least 1 years and endoscopic oesophagitis have been identified formed the patient group and 50 healthy individuals formed the control group. The people who have the habit such as rumination, vomiting or bruxsizm and any medication users were excluded. Dental erosion was evaluated by the Smith and Knight index. Pearson chi-square test and Fisher exact test were used for the statistical analysis.
Results: Wear of palatal surface of maxillary teeth was observed in the patient group, but no wear was observed in the control group ($p < 0.05$). Wear of insizal surface of maxillary anterior teeth and occlusal surface of maxillary/mandibular posterior teeth was observed at certain rates in both groups, but the values were higher in the patient group ($p < 0.05$). The wear values of cervical and buccal/labial surfaces of maxillary teeth, cervical, buccal and lingual surfaces of mandibular posterior teeth and all surfaces of mandibular anterior teeth were not found different between the groups ($p > 0.05$).
Conclusion: Dentists should be considered the GERD patients as a risk group in terms of dental erosion and should be in interdisciplinary co-operation with gastroenterology for acid suppression and treatment of the disease.

P555

Evaluation of Location of the Mental Foramen: A Radiographic Study

Derya Yılmaz, Faruk Akgünlü, Burcu Apaydın Gezgin, Füsun Yaşar
Department of Oral Radiology, Selçuk University, Konya, Turkey

Aim: The aim of the present study was to investigate the location of the mental foramen on digital panoramic radiographs of the patients in a selected Turkish population.
Materials and methods: In this study, 323 digital panoramic radiographs of patients (163 females, 160 males) were analyzed. The patients' ages ranged from 13 to 68 years, and mean age was 30.4. All patients had fully erupted lower premolars and there was no missing teeth in the mandibular anterior region. In addition, the radiographs were free from radiolucent or radioopaque lesions in the lower arch. Both of the mental foramens were definable on all panoramic radiographs. The different locations of mental foramen on panoramic radiographs were evaluated according to first and second lower premolars and as symmetric and asymmetric. The average distance between mental foramen and inferior border of mandible was also analyzed.
Results: The most frequent locations of mental foramen are between first and second premolars (%61.1) and in line with the second premolar (%26.6). Mental foramen was symmetrical in % 61.3 of patients. Its average distance, on the right side, to the inferior border of the mandible is 13.28 mm, on the left side it is 13.13 mm.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

To know the position of the mental foramen is important for regional anastesia, surgical procedures and the placement of osseointegrated implants in the mandibular premolar region.

P556

Prevalence of Temporomandibular Disorders in Faculty of Dentistry, University of Malaya

Nosizana Mohd Salleh[1], Pang Yok Wen[1], Tan Hui Ying[1], Lily Azura Shoaib[2]

[1]Department of Prosthetic Dentistry, University of Malaya, Kuala Lumpur, Malaysia, [2]Department of Children Dentistry and Orthodontic, University of Malaya, Kuala Lumpur, Malaya

Aim or Purpose: The aim of this epidemiological study was to determine the prevalence of Temporomandibular Disorders (TMD) among students, staffs, and patients in Faculty of Dentistry, University of Malaya.

Methods: A total of 488 subjects, aged 16 to 84 year old, which were selected randomly from students, staffs and patients in Faculty of Dentistry, University of Malaya. Ethical approval was obtained prior to the study. Questionnaire based interview and clinical examinations were carried out according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). Diagnosis was made and information regarding ethnic groups, socio-demographic data, dental status, parafunctional habits were included.

Results: One hundred and ninty-six (40.2%; 84 male and 112 female) subjects were diagnosed with RDC/TMD. Distribution of each RDC/TMD group were as follows; group I – 31.1% (N = 61), group II – 56.1% (N = 110), group III – 7.7% (N = 15) and multiple diagnoses of subgroup combination 5.1% (N = 10). RDC/TMD were diagnosed in 36.2%, 45.4%, 17.4% and 1% within the ethnic group; Malay, Chinese, Indian and other races respectively. No statistically significant difference was noted between ethnic ($p > 0.05$). Among the subjects wearing denture 40.6% (N = 69) were diagnosed with RDC/TMD. Parafunctional habits showed significant association in the subjects diagnosed with TMD.

Conclusions: Result of the study indicated within subjects diagnosed with RDC/TMD group II was found to be higher.

P557

Incidence of Canine Impaction and Transmigration

Burcu Apaydın Gezgin, Füsun Yaşar, Derya Yılmaz, Faruk Akgünlü

Department of Oral Radiology, Selcuk University, Konya, Turkey

Aim: The aim of this study was to evaluate incidence of impacted maxillary and mandibular canines and determine the incidence of transmigrant maxillary and mandibular canine teeth with regard to their transmigration patterns in a Turkish subpopulation.

Materials and methods: Maxillary canine impaction is a well known dental anomaly and the incidence is in the range 0.8–2.8%. Mandibular canine impaction is less frequent and the incidence was reported to be 20 times lower than that for maxillary canines. Migration of a tooth across the midline is an even rare anomaly. In this study, 1780 consecutive panoramic radiographs were evaluated. The transmigrant mandibular canines were classified according to Mupparapu.

Results: The incidence of canine impaction was found to be 3.03%. The incidence of canine transmigration was 0.44%. The most frequent impacted canines were maxillary left canines (41.53%) and the most frequent position was mesioangular position (73.84%) and the most frequent transmigration pattern was type 1 (50%).

According to a study which was performed in 2004 with Turkish patients, incidence of canine impaction was found 3.58% and the incidence of canine transmigration was 0.31%. According to our results the incidence of impacted canine teeth and transmigration may be more frequent than was previously thought.

P558

Fibro-Osseous Lesions: A Clinicopathological Study and Reclassification

Afshin Kavoosi, Payam Tawakoli

Department of Pathology, Faculty of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, Iran

Introduction: Fibro osseous lesions are a group of osseous lesions defined as replacement of normal bone structure with connective tissue, osseous and/or cementum-like calcified materials. For many years, the lesions have shown complications in classification. There is not a fully accepted classification for these lesions. The aim of this study was to determine clinicopathological features of these lesions and attempt to re-classification of fibro-osseous lesions.

Materials and methods: One of the fibro-osseous lesions group was selected and evaluated by light microscopy. In order to correct diagnosis, clinical variables, such as age, sex, location of lesion, pain, expansion as well as radiographic features were recorded. Also, microscopic features, including connective tissue stroma, type of calcified materials, inflammatory cells, and presence of giant cells, hemorrhage and osteoblastic border were recorded. In addition, the pattern of calcified materials, produced by the lesion, was studied by polarized light microscopy.

Results: Among 8893 cases, fibro osseous lesions were found consisting of 0.82% of total cases. Ossifying fibroma showed the highest frequency (59.9%). Whilst, periapical and focal cemento-osseous dysplasia (each 1.3%) revealed the lowest. Fibrous dysplasia consisted of 13.6% and Juvenile ossifying fibromas 2.7% of total cases. Fibro osseous lesion were prevalent in females in the 2nd decade.

Conclusion: Base on the results of the study, the necessity of combining all clinical, radiographic, surgical and pathologic findings is emphasized to achieve final correct diagnosis of fibro-osseous lesions. In addition, in controversial cases, applying polarized light microscopy is recommended as an adjunct diagnosis tool.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Theme: Implantology: Implantology

P559

SEM and Fractography Analysis of the Screw Threads of a Loosened Abutment and Fractured Abutment at the Same Patient: A Case Report

İkbal Leblebicioglu, Emel Kırac, Bülent Kesim, Ayşegül Güleryüz Gürbulak, Aytaç Yaşar, Taha Yaşar Manav
Depertment of Prosthodontics, Erciyes University Dentistry Faculty, Kayseri, Turkey

Aim: The aim of the present study is an analysis and structural examination of screw thread of a fractured abutment and loosened abutment compared with screw threads of a new abutment screw.

Case: The fractured abutment screw was determined in the clinical examination of the patient who consulted to the prosthodontology department with the complaint of his fractured Locator abutment.In his clinical examination it was seen that his Locator abutment at 33 region was fractured and the fractured part of the screw was still inside the implant. The other Locator abutment at 43 region was also loosened. The fractured screw was removed with an ultrasonic instrument successfully and the other abutment also removed in order to be changed with a new one. Both of the abutments were changed with new ones and the occlusion of the all dentures were turned into bilateral balanced occlusion. Six months and twelve months after the delivery of the dentures, the patient came for his recalls. There was not seen any problems in his clinical examination. The loosening of screw threads, fractured screw threads were retrieved and analyzed under SEM. They were also compared to screw thread with a new Locator abutment of the same implant system.

Conclusion: Many alterations and deformations were present in concavities and convexities of threads in the loosened and fractured screws. No macroscopic alterations or deformations were observed in the loosening abutment.

P560

Clinical and Radiological Evaluation of Implants with Different Abutment-Implant Connection

Levent Özgür[1], Birgül Özpınar[2], Bülent Gökçe[2], Pelin Güneri[3]
[1]*Turkish Army Forces Rehabilitation and Care Center, Ankara, Turkey,* [2]*Department of Prosthodontics, Ege University, Izmir, Turkey,* [3]*Department of Oral and Maxillofacial Radiology, Ege University, Izmir, Turkey*

Aim: In this study, the aim was to measure the crestal bone loss and periodontal effects of dental implants with different abutment-implant connections after prosthetic loading by using a split-mouth study design.

Materials and methods: Total of 31 bone level with platform switching design (BL) and 31 tissue level (TL) implants were applied on nine patients. The day of the delivery of 62 implants was recorded as baseline (0) and follow-up periods were determined as 3rd and 6th months post-insertion. However, seven patients with 46 implants (23 TL, 23 BL) were followed-up for 12 months. For radiological evaluations, periapical radiographs which were taken with standard parallel technique were used. For periodontal assessment, sulcus depth (SD) modified plaque index (MPI) and bleeding on probing (BOP) indices were employed.

Results: Increased bone loss on TL implants were observed for all time periods (B3 TL: 0.110 ± 0.101 mm; BL: 0.072 ± 0.067 mm; B6 TL: 0.205 ± 0.151 mm; BL: 0.150 ± 0.126 mm; B12 TL: 0.271 ± 0.167 mm; BL: 0.170 ± 0.099 mm). However, only the differences between the baseline and the 12th month were significant ($p = 0.007$). Periodontal indices around TL implants also resulted in higher values but these were substantial ($p > 0.05$).

When clinical and radiographic results were considered, BL implants revealed notable clinical performance than TL implants for the preservation of the crestal bone and periodontal health.

P561

Short Implant Rehabilitation of Patients with Atrophic Maxilla: Case Series

Nihat Akbulut[1], Kaan Yerliyurt[2], Mehmet Kemal Tümer[1]
[1]*Department of Oral and Maxillofacial Surgery, Gaziosmanpasa University, Tokat, Turkey,* [2]*Department of Prosthodontics, Gaziosmanpasa University, Tokat, Turkey*

Objectives: Short dental implants, having length of 8 mm or less, can be placed or used as an alternative to bone augmentation procedures for allowing the placement of longer implants.

Short implants could be a simpler, cheaper and faster alternative with less associated morbidity to longer implants placed in augmented bone.

We present three patients having maxillary alveolar crest deficiency rehabilitated with short implants restorations.

Case Series: In this study, we used short implants with plateau design, screwless, locker taper, in length of 6–8 mm for rehabilitation severely resorbed maxillary alveolar crest in patients.

Case 1: A 43-year-old male patient had lost the right maxillary premolar and molar teeth. Three pieces of short implants with 6 and 8 mm in length were inserted in this region. After 5 months, this area restored with implant supported crown – bridge prostheses.

Case 2: A 60-year-old male patient had fully edentulous maxillary arc with prolapsed sinuses. Eight piece of short implant has been placed in the upper jaw. Then the patient's upper jaw was restored with implant supported fixed prosthesis.

Case 3: A 56-year-old male patient had edentulous right posterior maxillary arc and also he had a little bit sinus prolapsed situation in his molar region. He finally treated with crown-bridge restoration supported with short length of implants.

Conclusions: This study shows that the use of short implants may be considered for prosthetic rehabilitation of the severely atrophic maxilla as an alternative to more complicated surgical techniques as sinus, nasal floor lifting, etc.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P562

Esthetic Solutions for Congenitally Missing Maxillary Lateral Incisors

Ali Şirali[1], Seda Özturan[1], Fethiye Çağlar[1], Alper Gültekin[2]
[1]*Department of Periodontology, Bezmialem University, Istanbul, Turkey,* [2]*Department of Oral Implantology, Istanbul University, Istanbul, Turkey*

Introduction: There are various alternatives for treating congenitally missing lateral incisors. Treatment options include using canines as substitutes, tooth-supported restorations, auto-transplantation and orthodontically preparing adequate space for a single tooth implant.
Case: In our cases; considering arch length discrepancy, upper incisor inclinations and facial esthetics, it was decided to prepare adequate space for lateral implants on one side and to restore peg shaped lateral incisors prosthetically on the other side. To achieve this goal after levelling and aligning; opening the required space with coil-springs was initiated. As there was no contralateral tooth available to measure the mesiodistal width of the lateral incisors; it was calculated according to the central incisors. After preparing enough space for both lateral incisors; consulting with oral implantology we decided to assess the skeletal maturity of the patients. Hand and wrist radiograph validated our implant placement time. Pre-prosthetic orthodontic treatment was successful. Enough space for both single tooth implants and restorations were prepared orthodontically with paying attention to the root divergence in the implant site. For both patients, Nobel GroovyTM implants (3.5 mm diameters, 10 mm length) were inserted on the agenesis sides. After having waited for 3 months for osseointegration, NobelProcera ZirconiaTM abutments were placed and Zirconium crown restorations were prepared for both sides.
Conclusion: Among all treatment options for congenitally missing lateral incisors, preparing adequate space for implants and restorations is the most conservative approach to provide esthetic and functional demands.

P563

Comparison of an Alloplastic and a Xenogeneic Bone Graft Materials

Andreia Figueiredo[1,3,4], Patrícia Coimbra[2], António Cabrita[1], Fernando Guerra[3], Margarida Figueiredo[2]
[1]*Experimental Pathology Service, University of Coimbra, Coimbra, Portugal,* [2]*Chemical Engineering Department, University of Coimbra, Coimbra, Portugal,* [3]*Dentistry Department, University of Coimbra, Coimbra, Portugal,* [4]*Health Sciences Department, Catholic Portuguese University, Viseu, Portugal*

Aim or purpose: To compare two bone graft materials that are used for the same purposes in implantology procedures.
Materials and methods: Grafting material morphology was assessed by scanning electron microscopy (SEM), by spreading a few granules on a double-sided carbon conductive tape. Particle size distribution was determined by laser diffraction spectrometry. At least three measurements were performed for each sample. Information regarding samples porosity and pore size distribution was obtained by mercury intrusion porosiometry. The porosity was calculated as the ratio of the total volume of mercury intruded and the total sample volume. Two samples of each material were analyzed by this technique. The particles real density (mass per volume of solid, excluding empty spaces) was determined by gas pycnometry. Samples specific surface area was measured by the nitrogen adsorption technique using the BET method. For contact angle analysis, the materials were compressed into tablets with a manual hydraulic press.
Results: The results showed that the two grafts have quite different characteristics in practically all the evaluated properties. In what concerns shape, surface topography and size, xenogeneic granules, besides being larger, are irregular, and exhibit sharp-edged tips, while synthetic ones are approximately cylindrical, with round contours, and more uniform in size. Also, the specific surface area of the xenogeneic material is considerably higher than the one of the synthetic one.
Conclusions: It is believed the provided data will assist clinicians to make a more informed choice between these two classes of regeneration materials.

P564

Evaluation of Periodontal Regular Maintenance for Dental Implant Patients

Ai Sakuma[1], Yuki Iwaki[2], Ryunosuke Kazama[2], Akihisa Mano[1], Yukio Aso[1]
[1]*Aso Dental Clinic, Shizuoka, Japan,* [2]*Tokyo Medical and Dental University, Removal Partial Denture Prosthodontics, Tokyo, Japan*

Purpose: The aim of this retrospective study was to evaluate the effect of 5-years of regular maintenance for patients with dental implants.
Methods and materials: Seventy-four patients with 284 implant cases that visited our private dental office (Aso Dental Clinic) between 2007 and 2013 were selected. They were divided into a regular periodontal maintained group (RG; 49 patients with 198 implant cases, 21 men and 28 women) and an irregular group (IG; 25 patients with 86 implant cases, 13 men and 12 women). Each patient was evaluated in terms of plaque control record (PCR), bleeding on probing (BOP), and the number of pockets with probing depth over 4 mm (NP) at initial visit and 5 years after implant treatment. The amount of bone resorption (BR) and remaining supportive bone (RSB) of each implant were measured on x-ray film, and the proportion of implants with BR over 2 mm (BRP) was calculated in each group. Fisher's exact test was used to analyze BRP between the two groups. The student *t*-test was used to analyze other survey items between the two groups.
Results: There were significant differences in PCR between the groups at both times ($p < 0.05$). The BR of IG showed a significantly higher value following 5 years ($p < 0.01$). The BRP of IG also showed a significantly higher value following 5 years ($p < 0.05$).
Conclusion: The results suggest that regular maintenance may prevent bone resorption following dental implant treatment.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P565

Clinical and Radiograohic Evaluation of Implants Placed with CT-Derived Surgical Guides

Erkut Kahramanoğlu[1], Burçin Vanlıoğlu[1], Yaşar Özkan[2], Yasemin Kulak Özkan[1]

[1]Department of Prosthodontics, Marmara University, Istanbul, Turkey, [2]Department of Oral and Maxillofacial Surgery, Marmara University, Istanbul, Turkey

Purpose: As implant dentistry is evolving toward accelerated treatment protocols, with immediate or delayed functional and nonfunctional loading, the importance of presurgical planning becomes paramount. Based on three-dimensional implant planning software for computed tomographic (CT) scan data, customized surgical templates could be designed to ensure high precision transfer of the implant treatment planning to the operative field. The aim of the present study was to evaluate a concept including a treatment planning procedure based on CT scan images and a customized surgical template (Simplant Software, Materialise, Leuven, Belgium).

Materials and methods: Ten complete edentulous and four partial edentulous jaws were included in this study. Patients received a CT of the appropriate arch using a denture with radiopaque markers indexed to the opposing arch. The software allowed precise planning for implant placement after which the planned case was sent to a manufacturing facility for splint and prosthesis construction. A total of 92 implants were installed according to the surgical guide and patients were fallowed for a mean period of 5 years.

Results: Interactive computer imaging can allow precise planning for implant position and the images can be used for guide splint. This technology is powerful, easy to use, and is a significant advance in implant dentistry. The advent of CT imaging, and CT-derived surgical templates allow for clinically significant improvements in accuracy, time efficiency, and reduction in surgical error, benefiting the patient, surgeon, restorative dentist, and the laboratory.

P566

Clinical and Radiographic Evaluation of Early Loaded Maxillary Anterior Single Tooth Bone Level Implants

Yaşar Özkan[1], Burçin Vanlıoğlu[2], Erkut Kahramanoğlu[2], Yasemin Kulak Özkan[2]

[1]Department of Oral and Maxillofacial Surgery, Marmara University, Istanbul, Turkey, [2]Department of Prosthodontics, Marmara University, Istanbul, Turkey

Purpose: The aim of this study was to evaluate the clinical and radiographic outcome of early loaded implants in the esthetically demanding regions.

Methods and materials: Patients were treated with implant (Straumann Bone Level Implant, Institute Straumann, Basel, Switzerland) supported all ceramic single crowns and followed for 2–4 years. The implants were evaluated by clinical and radiographic parameters. Clinical parameters like plaque index, sulcus bleeding index, peri-implant probing depth (PD), and marginal bone loss (MBL) were recorded. Repeated-measurement ANOVA, Kruskal-Wallis test, Wilcoxon signed rank test and paired samples test were used for statistical analysis.

Results: Fifty-five implants were placed in 47 patients. At the recall examinations, all implants were successfully integrated, demonstrating healthy peri-implant soft tissues as documented by standard clinical parameters. Plaque accumulation scores of 2 and 3 were not noted during the entire study. At baseline the mean PD value was 2.15 (0.62) mm, 2.24 (0.61) mm at 2 years. The PD of the implants at 3 years was 2.22 (0.62) and the mean PD of 7 implants was 1.86 (0.37) mm at 4 years. There were no statistically significant differences between time intervals ($p > 0.05$). All implants showed less than 0.5 mm MBL. Seven of the implants showed an increase at the level of the bone contact. The difference between baseline and last recall in mean MBL value was 0.119 ± 0.21 mm in mesial side, and 0.158 ± 0.254 mm in distal side. There were no statistically significant differences within time ($p > 0.05$).

P567

Comparison of Two Block-Out Methods for Mandibular Implant Retained Overdentures

Süha Serhat Türkaslan, Sibel Kan, Zeynep Başağaoğlu Demirekin

Department of Prosthodontics, Süleyman Demirel University, Isparta, Turkey

Objective: The aim of this study was to compare two direct incorporation methods of o-ring attachments over for both angled and parallelly inserted implants used as retantive components for mandibular overdentures.

Materials and methods: Forty dental practitioners were assigned for this study. Each practitioner were asked to attach the o-ring retentive component to the previously fabricated overdenture prostheses. Eighty implants analogs (40 angled, 40 parallel) with ball attachment abutments were embedded in 40 gypsum models, simulating the edentulous mandibular ridge. Twenty models were including 30° angled to each other and 20 models were including parallel o-ring abutments. Randomised 40 gypsum models including implants either angulated or parallel were given to 40 dentists. Each dentist used composite resin or rubber dam for block-out material equally.

Results: Direct attachment incorporation with rubber dam was found less successful for both groups; but the angulated group recorded statistically significant lower scores. Composite resin was successful for both groups and the parallel group scored higher.

Conclusion: When implant retained overdentures are in question, while incorporating the attachments to the overdenture, the preference of composite resin as a block-out material is superior to rubber dam.

P568

Clinical Study of Immediate Loading of Implants in Partialful Edentulous Jaws

Wei Jiang, Yueling Li, Ming Yu, Huijuan Tu

Shanghai Jiading Dental Diseases Prevention and Cure Center, Shanghai, China

Purpose: To determine the feasibility of using primary stability as a predictor of implant success the short-term clinical result of treatment.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Materials and methods: This study included 36 partially edentulouspatients, in whom a total of 86 implants were placed (34 in maxillary and 52 in mandibular). All implants were immediately loaded. Within 2 h providing support for fixed provisional prosthesis and noble-metal-ceramic crowns were completed within 3 months. All patients were followed up by 1, 3, 6, 12 months and after the patients were checked every 6 months.
Results: No implants were lost during follow-up (range 5–36 months, mean of 19 months), and no infections, nerve or sinus damages or other accidents occurred. No implants exhibited periimplant radiolucencies. Moreover, immediate loading seems to increase the ossification of the alveolar bone around endosseous implants.
Discussion: This research showed that immediate loading is a viable treatment modality. The favorable success rate reported for rough-surfaced implants suggest that adherence to a protocol, an important parameter of which is primary stability above 32 Ncm, can lead to osseointegration.
Conclusions: The results suggest that patients who are partially edentulous may be immediately restorations, and provide that the dental implants are adequately stable immediately after their surgical placement. The experience described in this study indicate that immediate loading with restorations using appropriate surgical and restorations techniques with one-stage JIAD (KOM) implant system can predicate the partially edentulous mandible in some cases. Further study is needed to determine the long-term result of immediately loaded implants.

P569

Surgical Guide and Multiple Implant Procedures

Adrian Mihail V. Nistor, Marian Vladimir Constantinescu, Michael Gross, Grigore Lazarescu
Department of Restorative Dentistry, Faculty of Dentistry, Baskent University, Ankara, Turkey

Aim: To present the experience of authors in the routine of surgical guide. From the diagnostic to the final prosthesis there are important and precise steps and every one must be planned based on a rigorous observations. The authors have a rich documentation of multiple clinical situations but is important to demonstrate the capability to choose the architecture of surgical guide and the surgical protocol.
Methods and materials: In this study were introduced 32 patients who where diagnosed with multiple edentations caused by various factors (decays, periodontal disease, trauma, etc.). For everyone was realized a surgical guide according to surgical protocol and finally to prosthetic plan. The titanium surgical guide was produced by the 3D model using CBCT. Surgical procedure was planned and realized using surgical guide tooth-supported (21 patients) or mucosa supported (11patients). In 12 cases was necessary bone addition to correct bone loss caused by pathological origin or to add in the sinus floor elevation. One hundred and six implants were introduced using surgical guide under local anesthesia.
Results: Immediate results using surgical guide are excellent only if are respected the surgical plan and adequate protocol. In 3 cases was necessary to re-suture the surgical wound caused by local conditions of oral flaps. Failure of implants was observed only in 4 cases due to inadequate bone quality.
Conclusions: Implant surgical procedures using prefabricated surgical guide are improved only if we use an adequate protocol both in planning and in the accurate technique.

P570

Oral Implantology by the Electro-Wielding Technique

Mihaela Raescu[1], Massimo Azaria De Cesare[2], Florin Eugen Constantinescu[3], Carmen Defta[4], Marian Vladimir Constantinescu[1]
[1]UTM Bucharest, Romania, [2]University Federico Napoli II, Napoli, Italy, [3]Romanian Association of Oral Rehabilitation and Posturotherapy – ROPOSTURO, [4]University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania

Aim: The aim of this study is to demonstrate the efficiency of a method through which, in the same session, after inserting the implants you can rehabilitate the prosthetic field by using a resin fixed denture, restoring the function and aesthetics of the stomatognathic system.
Materials and methods: The implanto-prosthetic protocol (for the two clinical situations presented) consists of 3 phases: presurgical, surgical and postsurgical.

The presurgical phase consists of the instrumental and radiological evaluation of the general and specific conditions.

The surgical phase consists of anesthesia, preparation of the implantation situs (flapless), positioning the titan implants and wielding the titan solidification bar (placement, wielding, cooling).

The postsurgical phase consists of establishing a fixed prosthesis and reestablishing the occlusal relationships in the same session.
Results: The results showed the efficiency of the electro-welding technique associated with a minimally invasive surgery technique, which recalibrates the functionality and aesthetics of the stomatognathic system.
Conclusions: The one step electro-welding implantology is an efficient technique, that brings predictable results in rehabilitation of the total edentulous patients. Using the immediate load, it provides comfort and fast recovery of the patient health.

Theme: Implantology: Oral Medicine

P571

Transcriptome Analysis of bFGF-Induced Rat Pheochromocytoma Cells

Yoshitsugu Ishikawa[1], Michiharu Shimosaka[1], Yu Fujita[1], Ujjal K Bhawal[2], Yoshimitsu Abiko[2], Koh Shibutani[1]
[1]Department of Anesthesiology, Nihon University School of Dentistry at Matsudo, Japan, [2]Department of Biochemistry and Molecular Biology, Nihon University School of Dentistry at Matsudo, Japan

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: Growth factors can regulate the proliferative or differentiation processes by analogous mechanisms. Basic fibroblast growth factor (bFGF), a member of FGF family, has broad biological functions involving the regulation of cell growth, differentiation, and proliferation.
Methods and materials: We sought to elucidate the pattern of the molecular mechanisms governing the bFGF-induced rat pheochromocytoma cell line, PC12, likely involve multiple converging signal transduction pathways. Total RNA was extracted after 24 h of bFGF-treatment in PC12 cells and monitored mRNA levels using Affymetrix GeneChip (rat Genome 230 2.0 Array). GeneChip data was analyzed by GeneSpring software and Ingenuity Pathway Analysis system. Real-time RT-PCR and Western blot were used to investigate the gene expression changes.
Results: The differentially expressed genes represented functions as diverse as growth and differentiation. DUSP showed a greater than two fold change in expression relative to those in control cells. Altered mRNA levels in GeneChip analysis were confirmed by real-time RT-PCR. We have identified differential gene expression up-regulated or down-regulated with the up-regulation of DUSP in bFGF-treated cells. Another important finding of our study provides the data on the involvement of DUSP in ERK-dependent signaling pathways in PC12 cells, which suggests a central role of ERK in the neuronal induction by bFGF.
Conclusion: These findings indicate that the molecular mechanisms underlying the DUSP response of PC12 cells to bFGF treatment likely involve multiple converging signal transduction pathways.

Theme: Implantology: Oral Pathology

P572

Medical Management of Complications Induced by Biphosphonates in Maxillomandibular Complex

Jeaneth Lopez[1], Carlos Javier Alzaibar[2], Enid Margarita King[2], Miguel Angel De Camara[2], Sasha Abdulhadi[2]
[1]Department of Oral Pathology. Universidad Central De Venezuela, Caracas, Venezuela, [2]5th year Student. Universidad Central De Venezuela, Caracas, Venezuela

Biphosphonates are compounds used in prevention and treatment of bone resorption pathologies. They are mainly prescribed by doctors in the field of gynecology, traumatology, oncology and endocrinology.
Purpose: Establish the knowledge and management of the medical area about the complications aroused by the biphosphonates treatment in the maxillomadibular complex. MATERIALS AND METHODS A survey was made to a population of 71 venezuelan medical professionals in the areas of gynecology, traumatology, oncology and endocrinology who prescribed different types of biphosphonates between October 2011 and July 2012. RESULTS Most of the professionals surveyed prescribe biphospfonates using bone densitometry as the main diagnosis criteria, been alendronate and ibandronate the most commonly prescribed BFF. Seventy-seven percent of the ones who prescribe BFF don't refer the patient to the dentist to get an evaluation before starting the biphosphonates therapy. Only 17% of the doctors have seen a case of osteonecrosis of the jaw in their practice and in case of finding evidence of osteonecrosis 77% of the surveyed would suspend the treatment and only 7% would consider following the dentist's guidance.
Conclusions: There's a lack of communication between Venezuelan dentists and doctors resulting in doctor's poor understanding of the complications in the maxilo-mandibular complex caused by the treatment involving BFF. We strongly suggest creating stronger bonds between both professions in order to reduce complications involving the maxilo-mandibular complex and ensure the patient's wellbeing.

Theme: Implantology: Oral Surgery

P573

Retrospective Investigation for the Space-Occupying Lesions of the Temporomandibular Joint

Juanhong Meng[1], Xuchen Ma[2]
[1]Department of Oral & Maxillofacial Surgery, Peking University School of Stomatology, Beijing, China, [2]Center for TMD & Orofacial Pain, Peking University School of Stomatology, Beijing, China

Purpose: To study the clinical, radiological and pathological manifestations of space-occupying lesions of the temporomandibular joint and provide references for the early diagnosis and treatment of these diseases.
Methods and materials: To review the clinical data of space-occupying lesions of the temporomandibular joint in Peking University School of Stomatology between January of 1990 and March of 2013. Two hundred and twenty-seven cases of temporomandibular joint space-occupying lesions undertaken surgery and verified by pathological examinations were selected for the retrospective analysis.
Results: Among 227 tumors and tumor-like lesions of temporomandibular joint with surgery, female was 153, male was 74, and the ratio of female to male was 2.1:1. The ages ranged from 8 to 70 years old, and the median age was 36. The courses of diseases were half a month to 20 years, and the median was 2 years. There were benign tumors and tumor-like lesions, 212, occupying 93.39%; malignant tumors, 15, occupying 6.61%. Osteoma was the commonest among all of the lesions, 33.04%. The followings were condylar hypertrophy, 20.26% and synovial chondromatosis, 15.42%. Chondrosarcoma is the commonest among the malignant tumors, 3.08%; then followed by osteosarcoma, metastasis and synovial sarcoma, etc.
Conclusions: Space-occupying lesions of the temporomandibular joint include tumors and tumor-like lesions which may mimick the symptoms of TMD, and the differential diagnosis is necessary. The clinician must be careful to these lesions so as to give the early diagnosis, correct treatment and avoid misdiagnosis.

P574

Minimally Invasive Approach for the Treatment of Advanced BRONJ

Lukas Hauer, Daniel Hrusak, Lubor Hosticka, Pavel Andrle, Jan Jambura, Petr Posta
Clinic of Dentistry, Department of Maxillofacial Surgery, University Hospital and Faculty of Medicine in Pilsen, Charles University in Prague, Czech Republic

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Introduction: Osteonecrosis of the jaw is a rare but serious adverse side effect of specific type of antiresorptive and/or biological therapy, which affects bone metabolism. Bisphosphonate – related osteonecrosis of the jaw occurs especially in oncological patients, but also much less frequently in patients with metabolic bone diseases. Up to 70% of these lesions arise after invasive procedures in the oral cavity.
Case: The authors present an unusual case of 57 years old woman with rheumatoid arthritis and glucocorticosteroid – induced osteoporosis receiving prednisone, leflunomide and alendronate. Osteonecrosis of the mandible with progression up to the 3rd stage with a pathological fracture developed gradually after teeth extractions in this patient. This lesion was treated by minimally invasive procedures, symptomatic and antibacterial therapy, which led to the complete resolution (systemic and local antimicrobials, pain control, superficial debridement, sequestrectomy in local anesthesia, semi-liquid diet, idle mode). The clinical course of this pathological condition in a period of 5 years is presented.
Conclusion: The jaw bone under the influence of bisphosphonate medication may still have sufficient healing potential even in the cases of severe osteonecrosis. Therefore a conservative approach may be considered even in patients with nondisplaced and nonmobile mandibular pathological fractures with minimal clinical symptoms. A radical surgical treatment with potential risk of deterioration could be reserved for other cases of pathological fractures and for symptomatic and refractory lesions of the 3rd clinical stage.

P575

Effects of Ozone Therapy on Postoperative Discomfort Following Third Molar Surgery

Hakkı Oğuz Kazancıoğlu[1], Esma Kürlü[2], Nihat Demirtaş[1]
[1]*Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Bezmialem Vakif University, Istanbul, Turkey,* [2]*Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Istanbul University, Istanbul, Turkey*

Objective: To evaluate the efficacy of the therapeutic ozone application in the management of pain, swelling, and trismus associated with surgical removal of impacted mandibular third molars.
Study design: Twenty consecutive patients with asymptomatic bilateral impacted mandibular third molars were recruited into the study. One side was extracted and received ozone therapy (study side), and the other side was extracted 2 weeks later from the first operation and received sham ozone therapy (negative control side), or diametrically opposed to this for correlation of post-operative pain development by patients.
Results: The study consisted of 20 patients (mean age: 22.6 $\pm$ 2.3 years, ranges from 18 to 25 years) with asymptomatic bilateral impacted mandibular third molars. No differences were found for mouth opening and swelling for both sides. The degree of pain and the number of analgesics tablets taken was significantly lower at study side. This study showed that ozone therapy had positive effect on OHIP-14 questionnaire results. Alveolar osteitis, paraesthesiae, bleeding, or altered nerve sensation was not observed in any patient post-operatively.
Conclusion: This study has demonstrated that ozone therapy is useful for the reduction of postoperative pain and it increases quality of life after third-molar surgery. However, it has no effect on postoperative swelling, and trismus.

P576

Evaluation of Life Quality after Apicoectomy

Cena Dimova[1], Ivona Kovacevska[2], Zlatko Georgiev[3], Biljana Evrosimovska[4], Kiro Papakoca[1]
[1]*Department of Oral and Maxillofacial Surgery, Faculty of Medical Science, University "Goce Delcev", Stip, Macedonia,* [2]*Department of Cariology and Endodontology, Faculty of Medical Science, University "Goce Delcev", Stip, Macedonia,* [3]*Clinic of Pedodontology, Faculty of Dentistry, University "Sts Ciryl and Methodius", Skopje, Macedonia,* [4]*Clinic of oral Surgery, Faculty of Dentistry, University "Sts Ciryl and Methodius", Skopje, Macedonia*

Aim: The aim of this study was to evaluate patient experience of quality of life following apicoectomy using two different techniques: preoperative and intra operative ortograde canal opturation.
Methods and materials: The study consisted of 40 patients referred for oral surgical treatment (apicectomy with periapical osteotomy). Three operators were carried out the treatments. All patients were given a questionnaire with 15 questions to evaluate their quality of life for 7 days after the oral surgery interventions. The patient's answers were referred as: not at all-1; very little-2; some-3; quite a bit- 4; very much-5). An equal number of patients were assigned to each group. Group 1 was treated by preoperative canal opturation and Group 2 was treated by intra operative ortograde canal opturation.
Results: The average time needed for completion the surgical procedure was approximately 35 min. The results showed that patients in Group 1 reported significantly more pain and took significantly more analgesics on day 5. On days 1 and 2, patients of the Group 2 reported significantly more difficulty in mouth opening, mastication, and the ability to speak.
Conclusion: High incidence of symptoms were reported by the patients in both groups. There were no significant differences found in the distribution of patients according to age, gender, periradicular diagnosis, and site of operation between the two groups. The technique using the preoperative canal opturation provided significantly less postoperative pain, but more difficulties in mouth opening, mastication, and the ability to speak immediately postoperatively.

P577

Cutaneous Metastasis from Esophageal Squamous Cell Carcinoma Resembling Morphea: A Case Report

Umit Ertas, Ertan Yalcın
Oral and Maxillofacial Surgery, Ataturk University Faculty of Dentistry, Erzurum, Turkey

Background: Cutaneous metastasis of malignant neoplasms are generally uncommon, but are being diagnosed with increasing frequency in recent years. In about 3–10% of patients with malignant neoplasms develop cutaneous metastases. Oesophageal carcinoma metastatic to the skin is relatively infrequent, accounting for approximately 3% of cutaneous metastases.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: The aim of this presentation is to describe a case cutaneous metastasis from esophageal squamous cell carcinoma resembling morphea.
Case: We report an 80-year-old male, with pain over left half of the face, severe trismus, intraoral swelling, a scar-like lesion, hyperpigmented, violet-pink coloured, hard on palpation on the skin of the left cheek, and movement of the jaws was restricted.
Conclusions: Cutaneous metastases are of diagnostic importance because they may be the first presenting sign of an undiscovered malignancy and because they may indicate a poor prognosis and early fatal termination.

P578

Apicoectomy with Er-Yag Laser-Analysis of Resected Tooth Surface

Vancho Spirov[1], Vera Stojanovska[2], Lidija Popovska[2], Ilijana Muratovska[2], Oliver Dimitrovski[1], Blagoja Dastevski[1]
[1]Department of Oral surgery, University St.Ciril and Methodius, Skopje, Republic of Macedonia, [2]Department of Dental pathology, University St.Ciril and Methodius, Skopje, Republic of Macedonia

Introduction: Laser is a device that produces light beam that is monochromatic, coherent and focused. The speed and efficiency of laser procedures are defined by the laser parameters, the surface area of the target and the speed with which the operator moves the hand. To achieve optimal effect, depending on the desired intervention is necessary to set appropriate terms of energy/power and frequency to obtain ideal results.
Aim of purpose: Our goal was to compare the VSP pulse, which creates the Er: YAG laser with his contact extension with the work of mechanical handpiece efficiency in their apical resection of the root, and to make analysis of resected root surface.
Material and methods: For the realization of set goals, we included 75 patients of both sexes. The samples were divided by random into five groups. The first four groups were treated with Er: YAG laser with different parameters and the fifth was a control group treated with mechanical handpiece. Analysis of the resected tooth surface was made with SEM microscope.
Results and discussion: The survey results showed a direct correlation between energy used and the time of resection. Increasing the pulse energy increases the damage of the tooth or the number of cracks of the resected tooth surface.
Conclusion: Ideal pulse parameters amounted 200 mj/20 Hz followed by 200 mj/30 Hz with subsequent equivalent effect is three times greater risk of cracking from mechanical handpiece and six times longer during the resection of the tooth surface.

P579

RFA Evaluation of Three Types of Early Loaded Implants and Marginal Bone Loss after 4 Years

Erkut Kahramanoğlu[1], Burçin Vanlıoğlu[1], Argir Liaje[1], Yaşar Özkan[2], Yasemin Kulak Özkan[1]
[1]Department of Prosthodontics, Marmara University, Istanbul, Turkey, [2]Department of Oral and Maxillofacial Surgery, Marmara University, Istanbul, Turkey

Purpose: To analyze implant stability of three different implant systems using RFA analysis and to correlate RFA measurements with 4 years of clinical and radiographical evaluation.
Methods and materials: Seventy -five implants were placed in 30 subjects posterior regions. Twenty-three Straumann (Institute Straumann AG, Waldenburg, Switzerland) (STR), 28 Astra (Astratech AB, Molndal, Sweden) (AST) and 24 Thommen (Thommen Medical AG, Waldenburg, Switzerland) (SPI) implants were inserted. RFA measurements were performed at implant placement, 1,2,3,4,5,6,7 and 8 weeks. Implants were loaded with prostheses after 8 weeks. After cementation of prosthesis all subjects were examined radiographically at 6, 12, 24, 36 and 48 month follow-ups.
Results: The results showed that there was no difference in the mean implant stability quotient (ISQ) values at implant placement (78.39 ± 3.95 for STR and 76.57 ± 5.12 for AST and 75.13 ± 5.72 for SPI). ISQ values were different between group ($p = 0.01$) (76.17 ± 4.45, 74.79 ± 5.59 and 71.50 ± 5.99 respectively for STR, AST and SPI). The effect of the dental arch and the diameter of the implant on the implant stability were statistically significant ($p = 0.01$). Mean marginal bone loss after 4 year was 0.22 ± 0.4 mm for ITI, 0.31 ± 0.5 mm for ASTRA, 0.39 ± 0.36 mm for SPI. All of three implant systems showed higher ISQ than clinically acceptable values for immediate/early loading. The success rate and bone loss after 4 years were similar to the values reported in the literature, thus early loading may be a useful procedure that allows reduction in treatment time.

P580

Solitary Bone Cyst: A Case Report

Uğur Sorkun[1], Abdulkadir Burak Cankaya[1], Vakur Olgac[2], Ayfer Kaynar[1]
[1]Department of Oral Surgery, Faculty of Dentistry, Istanbul University, Istanbul, Turkey, [2]Department of Oncology, Department of Tumor Pathology and Oncologic Cytology, Instute of Oncology, Faculty of Medicine, Istanbul, Turkey

Introduction: Solitary bone cyst is an intraosseous pseudocyst having a tenuous lining of connective tissue without epithelium, either empty or filled with serous or sanguinous fluid which also can be referred as simple bone cyst, traumatic bone cyst, hemorrhagic bone cyst, hemorrhagic cyst, idiopathic bone cavity and unicameral bone cyst.
Case: This case report describes a clinically and radiographically an atypical case of a large multilocular solitary bone cyst involving the mandibular left body and chin region of a 13 year old boy.

P581

Maxillary Sinus Floor Augmentation and Immediate Implant Placement in Congenital Adrenal Hyperplasia: Case Report

Meltem Koray[1], Nedim Ozer[2], Beril Alkan[1], Hakkı Tanyeri[1]
[1]Istanbul University, Faculty of Dentistry, Department of Oral Surgery and Oral Medicine, Istanbul, Turkey, [2]Medipol University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Istanbul, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Introduction: Congenital adrenal hyperplasia is an autosomal recessive hereditary disorder related to the adrenal glands, with a deficiency of 21-hydroxylase, leads to decreased production of cortisol and aldosterone with increased androgen secretion. We present a case of female patient with congenital adrenal hyperplasia rehabilitated with maxillary sinüs floor augmentation and immediate implant placement.
Case: Forty-two-year-old female patient with congenital adrenal hyperplasia was using daily 0.5 mg dexamethasone. She had inadequate bone volume condition for implant placing and underwent sinus augmentation. Radiologic evaluation included orthopantomography and maxillary computed tomography. Preoperative radiograph shows 4–6 mm of residual bone height. Corticosteroid doses should be increased in those patients who take less than 30 mg a day, if the dose administered falls under this amount, the human body is not prepared to manage a stress¬ing situation, which may cause an adrenal crisis. This can be avoided by duplicating the normal dose before and after the dental proce¬dure. On the day of surgery 8 mg dexamethasone was administered to patient. During stress periods additional doses of medications are needed to avoid an adrenal crisis. Peroperatively she was administered 1 mg Midazolam, 40 mg Petidin HCL and 80 mg Methylprednisolone respectively. Treatment with antihypertensive drugs must not be interrupted. Postoperatively Cefazolin sodium (Im 2 × 1), Naproxen sodium (2 × 1) and %2 Chlorhexidine gluconate (3 × 1) was prescribed for 7 days. Five implants were placed after internal sinus lift in maxillary area after extractions and four implants were placed in mandible. After osteointegraion, the implant supported fixed prosthesis were performed.

P582

Effectiveness of A New Flap Technique on Primary Wound Healing After Lower Third Molar: A Pilot Study

Ümit Yolcu, Ahmet Hüseyin Acar
Department of Oral and Maxillofacial Surgery, Inonu University, Malatya, Turkey

Objective: To investigate the effectiveness of a new flap design on primary wound healing.
Study design: In this split mouth study, 13 patients with bilateral mesio-angular impacted mandibular third molars were included. Twenty-six 26 mesio-angular impacted mandibular third molars were extracted. Two different flap designs were used: a modified triangular flap and a new flap technique. On the 7th day after surgery, sutures were removed and primary wound healing was evaluated.
Results: In modified triangular flap group, wound dehiscences developed in 7 of 13 the patients. In the new flap group, wound dehiscences developed in 3 of 13 the patients.
Conclusion: The new flap technique seems to be more effective on primary wound healing after lower third molar surgery.

P583

Surgical Management of Panfacial Fracture: A Case Report

Umit Ertas, Ertan Yalcin, Nesrin Saruhan
Department of Oral and Maxillofacial Surgery, the Faculty of Dentistry, Ataturk University, Erzurum, Turkey

Introduction: Panfacial fractures present remarkable challenges to both surgeon and patient. Panfacial fractures are defined as fractures that simultaneously involve the upper, middle, and lower face. This type of trauma mainly involves the mandible, maxilla, zygomatic complex, naso-orbito-ethmoid region, and frontal bone and is often associated with emergencies, such as craniocerebral injury. Severe panfacial fractures can lead to complicated facial deformities, malocclusion and limited facial movement. This can lead to posttraumatic deformities that greatly influence the patient psychologically and limit his social rehabilitation, sometimes permanently.

Treatment of panfacial fractures can be difficult, because there are often no available stable structures to use as a focal point to re-establish bone continuity. The surgeon's task is to ensure a complete anatomical, aesthetic, and functional repair of the face, fully restoring it to its original three-dimensional shape.
Case: In this report, a panfacial fracture due to traffic accident, involved Le Fort I maxillary fracture, mandibular symphysis fracture and bilateral mandibular condyle fracture and its treatment with open reduction.

P584

The Interdisciplinary Treatment of Insufficient Inter-Oclusal Distance

Hilal Alan[1], N. Tülin Polat[2], Neslihan Şimşek[3], Cem Özgür[1], Ümit Yolcu[1]
[1]*Department of Oral and Maxillofacial Surgery, Inonu University Faculty of Dentistry Malatya, Turkey,* [2]*Department of Prosthetic Dentıstry, Inonu University Faculty of Dentistry Malatya, Turkey,* [3]*Department of Endodontics, Inonu University Faculty of Dentistry Malatya, Turkey*

Introduction: Deficiencies occur in inter-oclusal distance because of the position of the teeth to be replaced in the long-term untreated partial edentulous patient.
Case: In our poster presentation, we aimed to present a 43-year old woman who suffered from partial edentulism was referred to our hospital. There were inadequate inter-arch distance and bone height for placing endoosseos dental implants in the left posterior maxilla at clinical examination. A mucous retention cyst determined along the left sinus lining on the cone beam CT. The symptomless cyst was removed in order to do sinus lifting operation. There was no problem after 3 months and sinus lifting was performed with alloplastic graft material. After a healing period (6 month) inter-arch distance was increased with alveolar bone removing on the left posterior maxilla and endoosseoz dental implants were inserted in that area. Also posterior mandibular premolars were treated endodontically. All posterior teeth were restored with metal fused ceramic restorations.

P585

Maxillary Primary Intraosseous Carcinoma Arising De Novo: A Case Report

Zeynep Fatma Zor[1], Oguzhan Demirel[2], Ilkay Peker[2], Arzu Zeynep Yildirim[3]

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

[1]*Department of Oral&Maxillofacial Surgery, Gazi University, Ankara, Turkey,* [2]*Department of Oral Diagnosis and Radiology, Gazi University, Ankara, Turkey,* [3]*Department of Prosthodontics, Gazi University, Ankara, Turkey*

Aim: Maxillary primary intraosseous carcinoma (PIOC) is a rare malignant neoplasm with poor diagnosis. In this case report we represent a case of PIOC in the posterior maxilla.
Case: A 45 year-old male applied to our clinic painless swelling in the left posterior maxilla last 10 days.

He had no systemic disease and habit except smoking for 20 years. There were no anomalies extraorally. Intraorally we observed a non-ulcerated area of red, bleeding swelling between the teeth 2.4 and 2.7 on the left maxillary alveolar ridge. Patient proclaimed that the teeth 2.6 in the lesion exfoliated spontaneously. Panoramic radiography showed a large unilocular radiolucency in the left maxilla with ill-defined borders. Inferior border of the maxilla associated with the lesion was missing, no cortical boundaries of maxillary sinus could be viewed and the nasal septum was deviated to the right. The patient was guided to the oral&maxillofacial surgery clinic for biopsy. Histopathological observation showed squamous cell carcinoma (SCC). So he was treated by hemi-maxillectomy and radical neck dissection in the otolaryngology clinic. After the operation for prothetic rehabilitation an obturator was done. There were no metastases and recurrence after 1 year follow-up.
Conclusion: Histological evidence of SCC, no ulceration on the lesion and no distant primary tumor at the time of diagnosis and at least 6 months during the follow-up are the three specific criteria of PIOC. There were a few case reports about the maxillary PIOC. Early diagnose and radical treatment is very important for better prognosis.

Theme: Preventive Dentistry: Caries

P586
In-Vitro Studies on Na-alginate/Cetylpyridinium chloride Complex as an Antiplaque Agent
Sang Kyun Chae, John Hwan Lee, Taehun Park, Chanho Kim
Department of Personal Care Reasearch, Amorepacific Corporation, Yongin, Republic of Korea

Purpose: The purpose of study was to investigate the effects of sodium alginate with cetylpyridinium chloride (CPC) complex on In-vitro dental plaque formation.
Methods: Mucin coated Hydroxyapatite (HAP) Disks (Clarkson Chromatography Products) were placed in a 24 well and treated with 1 ml of test solution for 1 h at 35°C.

Test solutions were (1) CPC with different types of anionic polymers as sodium alginate, sodium carboxymethyl cellulose, xanthan gum, (2) CPC with differentiated sodium alginate content as 0% to 1.0% (3) The tested CPC with sodium alginate complex was compared to chlorhexidine 0.12%.

After treated 1 h, each well was washed three times and an overnight bacterial culture, biofilms of Streptococcus mutans (NCTC 10449), was added to each well. After 24 h incubation, stained with 1 ml of 0.1% (w/v) crystal violet and stained adherent cells were dispersed with 1 ml of 70% ethanol. The absorbance at 590 nm (OD590) was measured using a SpectraMax 190/spectrophotometer (Molecular Devices, LLC., USA).
Results: (1) CPC with sodium alginate complex significantly inhibited the growth of dental plaque compared to CPC with other anionic polymers.

(2) The antiplaque activity of CPC/sodium alginate complex enhanced as sodium alginate content increases.

(3) CPC and sodium alginate complex was highly effective against dental plaque formation than chlorhexidine 0.12%.
Conclusions: Sodium alginate enhanced delivery of CPC to musin coated HAP disk. Na-alginate/CPC complex was significantly inhibited the growth of dental plaque In-vitro.

P587
Comparison of the Efficiency of Conventional and Modernistic Methods: An In Vitro Study
Gökhan Özkan[1], Aydan Kanlı[2]
[1]*Adnan Menderes Üniversitesi, Diş Hekimliği Fakütesi, Ağız, Diş ve Çene Radyolojisi, Aydin,* [2]*Hacettepe Üniversitesi, Diş Hekimliği Fakütesi, Ağız, Diş ve Çene Radyolojisi, Ankara*

Aim: The aims of this study were; to evaluate the validity of micro-CT and the performance of pen type laser fluorescence device.
Materials and methods: Sixty extracted teeth with intact occlusal surfaces were evaluated by two calibrated examiners, using laser fluorescence device, micro-CT, bitewing radiographs and ICDAS II visual examination system. Histological examination was performed as the gold standard for the present study.
Results: Laser fluorescence device showed high performance when compared with radiological and visual examination methods. Micro-CT showed the best performance within the all methods.
Conclusions: Pen type laser fluorescence device is a suitable method for detecting occlusal caries lesions and micro-CT can be used as a valuable method to compare the caries detection methods.

P588
Efficacy of Photodynamic Therapy (PDT) in Decreasing *S. mutans*
Tezer Ulusu[1], Gizem İnan[1], Gülçin Akça[2], Aylin Gençkan[1], Çağdaş Çınar[1]
[1]*Department of Pediatric Dentistry, Gazi University, Ankara, Turkey,* [2]*Department of Medical Microbiology, Gazi University, Ankara, Turkey*

Objective: The aim of this study was to assess the effect of erythrosine and rosebengal –mediated photodynamic therapy (PDT) on oral infections caused by *S. mutans*.
Methods and materials: Saliva samples of 60 children aged between 8 and 10 who have not brushed their teeth more than 12 h prior to the procedure were evaluated. Only saliva samples in which *S. mutans* generated were used. *S. mutans* were grown in

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

a constant-depth film fermenter. Each saliva sample which *S. mutans* generated were divided to six identical parts in order to constitute six groups as follows: control group with no treatment (group A), rosebengal applied group (group B), erythrosine applied group (group C), rosebengal and light applied group (group D), erythrosine and light applied group (group E), and only light applied group (group F). The samples in groups D, E, F were subjected to light for 2 min. The bactericidal efficacy of each group was evaluated by observing *S. mutans* proliferation. Statistical analyses were performed with PAST software. One way ANOVA analysis and Tukey's pairwise comparisons were performed.

Results: Significant decrease of *S. mutans* proliferation was only observed when biofilms were exposed to both erythrosine and light and rosebengal and light (One way ANOVA test result, $p < 0.01$). Besides, erythrosine applied group, rosebengal applied group were found to be relatively effective on *S. mutans* proliferation as well (according to Tukey's pairwise comparisons; $p < 0.05$ for each as well).

P589

Remineralization and Caries Prevention Using Ammonium Hexfluorosilicate and Shrimp Paste

Doaa Abdellatif Elsharkawy, Asmaa Ahmed Mosleh, Maha Ahmad Niazy
Department of Operative Dentistry, AlAzhar University, Cairo, Egypt

Aim: To evaluate using fermented shrimp paste (SP) and ammonium hexafluorosilicate (SiF) for remineralization potential and acid resistance of enamel and root dentin.

Methods: One hundred and twenty Bovine enamel and 120 bovine dentin specimens were used in the study. Baseline radio density was measured for all specimens using digital radiography. Half of the enamel and half the dentin specimens were used for evaluation of remineralization potential of the agents, where the specimens were subjected to a demineralizing agent (phosphoric acid), then radio density was re evaluated. Either SiF or SP was applied to the surfaces and radio density was re-evaluated. For the preventive phase of the study, the agents were applied to the specimens prior to the application of the demineralizing agent to assess their effect on acid resistance. Radio density was evaluated after subjecting the specimens to the demineralizing agent. Changes in radio density were compared using paired *t*-tests.

Results: With remineralization, Both SP and SiF showed significant change in enamel radiodensity while with dentin, only SiF was effective in remineralization. For acid resistance, mineral loss was significantly less than the control specimens for both enamel and dentin. SiF was more effective than SP with the dentin specimens while SP had a significantly more pronounced effect on enamel.

Conclusion: both agents can be beneficial for remineralization and acid resistance, with SiF being more effective in remineralization due to its high Fluoride content and low pH, and SP due to its high Calcium and protein content.

Theme: Preventive Dentistry: Epidemiology

P590

The Relationship of Temporomandibular Disorders and Body Posture at Different Dentition Stages

Canan Dağ[1], Nurhan Özalp[2], Mustafa Dağ[3]
[1]*Dentalite Oral and Dental Health Clinic, Ankara, Turkey,* [2]*Departmeny of Pediatric Dentistry, Ankara University, Ankara, Turkey,* [3]*Department of Oral and Maxillofacial surgery, Gulhane Military Medicine Academy, Ankara, Turkey*

Aim: Temporomandibular disorder (TMD) is a pathological situation including masticatory muscles, head-neck muscles and temporomandibular joint. The relationship between body posture and alterations at stomatognathic system has become a subject of interest. The aim of this epidemiological study was to investigate the relationship between TMD and postural changings.

Methods and materials: This study included 1375 individuals was planned as a cross-sectional study containing the intra-oral and extra-oral examinations and evaluation of the photographs taken in front and in profile to investigate the association between TMD and body posture.

Results: As a result of general investigation of all children, forward head position and different shoulder levels were statistically related to the TMD ($p < 0.05$). At primary dentition, there was no significant relation between the forward head position and TMD, however, different shoulder levels were found to be significantly related to the TMD ($p < 0.05$). At mixed dentition, both of these parameters were statistically related to the TMD ($p < 0.05$). At the permanent dentition, there was no relation between the body posture and TMD.

Conclusion: TMD and body posture are parameters affect each other. The longitudinal studies including homogeneous sample groups at primary, mixed and permanent dentititons are needed for better evaluation of these relationship.

P591

The Effect of Socio-Demografic Factors on Partial Denture Classification among the Turkish Population

Gamze Mandali, Aysegul Yurdakos, Kazim Serhan Aksit
Department of Prosthodontics, Private Provincial Administration of Istanbul, Oral and Dental Diseases Hospital, Istanbul, Turkey

Objective: To examine the individuals with partial edentulousness in the Turkish population from a socio-demographic perspective based on the Kennedy classification in order to determine the risk factors for teeth losses.

Materials and methods: The study consisted of 1706 partial denture wearers (911 men and 795 women). The maxillary and mandibular structures of patients according to Kennedy classification and their age, sex, place of birth and education status were evaluated. The collected data was analyzed using both the chi-squared test and Fisher's Exact Chi-Squared test at a significance levelof $p < 0.05$.

Results: A statistically significant difference was observed among the maxillary/mandibular Kennedy classes in terms of age groups

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

($p < 0.001$), the types of prostheses used and maxillary/mandibular Kennedy classes in the antagonist jaws ($p < 0.01$) and maxillary Kennedy classes and birthplaces ($p < 0.05$).
Conclusion: Socio-demographic changes were found to be closely related with the Kennedy classification of partial denture wearers.

P592
Caries Status among Kindergarten Children in Kuwait
Fotooh Ali Alali[1], Huda Shaker Nazar[1], Sabiha Abdulkadir Al Mutawa[1], Jitendra Ariga[2], Pramod Soparkar[3]
[1]Ministry of Health, Superintendent of Oral Health, National Oral Health Program, [2]School Oral Health Program, Kuwait-Forsyth, Kuwait, [3]Forsyth Institute, Cambridge, MA, USA

Objectives: The aim of this study was to investigate the caries prevalence and severity in kindergarten children in Kuwait.
Materials and methods: In a cross sectional survey, a representative sample of 808 children were chosen from 23 kindergarten schools in Al-Farwaniya governorate in Kuwait. Two dental hygienists examined the children at their schools. Examination was done using mirror and periodontal probe with the presence of artificial light source on a portable dental chair. Dental data collected were: decayed, missed, and filled teeth along with other socio-demographic data.
Results: In 2010, eight hundred and eight children were examined with the mean age of the children that were examined was 3.7 ± 1.1 years. Male children were 46% (n = 370) and females were 54% (n = 438). Caries prevalence in 4 year olds children was 61%. Children without caries experience were 37%. The mean dmft was 4.3 ± 5. The mean decayed teeth were 4 ± 4.7, the mean missing teeth 0.2 ± 0.7, and the mean filled was 0.2 ± 0.7. No statistical significant differences were seen between genders; both gender had almost similar caries prevalence and caries severity.
Conclusion: Caries prevalence and severity in kindergarten school was high among the examined group. These results indicate an urgent need for a prevention program in Kuwait to control early childhood caries. Oral prevention program for children in age group of 1 to 4 years should be planned in future.

P593
Disk Position and Articular Eminence Inclination in Patients with Temporomandibular Joint Internal Derangement
Mehmet Ali Elçin[1], Şebnem Erçalık Yalçınkaya[1], Tonguç Sülün[2]
[1]Department of Dentomaxillofacial Radiology, Faculty of Dentistry, Marmara University, Istanbul, Turkey, [2]Department of Prosthodontics, Faculty of Dentistry, Istanbul University, Istanbul, Turkey

Objective: The purpose of this study was to investigate the association of disk displacement with the inclination of the articular eminence in patients with temporomandibular joint internal derangement.
Methods: A total of 208 joints of 104 patients (28.94 ± 9.35 year-old, n = 84 female/n = 20 male) with TMDs were examined by magnetic resonance imaging (MRI). Bilateral MRI scans in the sagittal (closed and open) position were evaluated. The disk position was classified as: 1- normal position '45.7%', with anterior disk displacement (ADD) 2- with and 3- without reduction (DDwR: "27.9%," DDwoR: "26.4%"). The angulation between the Frankfurt horizontal plane and the posterior slope of the articular eminence was analyzed with a software program (OsiriX Dicom Viewer). Asymptomatic side of the patients was also evaluated. One-way Anova and student-t tests were used for the statistical analysis.
Results: There was no statistically significant difference between articular eminence inclinations in normal joints, DDwR and DDwoR (50.65 ± 10.68, 50.75 ± 10.22 and 46.93 ± 9.67 respectively), ($p = 0.071$). The disk position of the patients with DDwoR was statistically significant compared with normal patients and patients with DDwR (88.93 ± 17.16, 14.45 ± 10.80 and 60.96 ± 22.45 respectively), ($p = 0.001$).

There were no statistically significant gender differences regarding the angle of the disk and articular eminence.
Conclusions: Although articular eminence inclination appears not to be directly related with the development of DD based on the findings of this studied population, it has been observed that the steepness of the articular eminence is decreased and leads to the flattening in the joints with DDwoR as a result of degenerative changes.

P594
Prevalence of Dental Caries and Periodontal Disease in Children in Latvia in the Period of 10 years
Simona Skrivele, Sandra Berzina, Inguna Rence Bambite, Ruta Care, Anda Brinkmane, Inga Rendeniece, Egita Senakola, Julija Kalnina
Riga Stradins University, Department of Conservative Dentistry

Aim: To assess prevalence of dental caries, periodontal diseases in children at the age of 12 in Latvia in the period of 10 years.
Materials and methods: The studies were carried out in 2001 and 2011. In 2001 were examined 1876 children and in 2011 – 5448 children. The studies were approved by the RSU Ethics Committee. Oral health assessment was performed using portable dental chairs with standard lights, dental mirror, a blunt probe and a periodontal probe. In order to assess caries the DMFT index was used. Periodontal conditions were assessed using CPITN.
Results: The mean DMFT in 2001 was 5.03, DMFS – 7.38 and in 2011 – 3.35 and 5.11. In 2001 the largest component of DMFT formed caries (DT – 2.93) and filled teeth (FT) – 1.96. In 2011 the largest component of DMFT was formed by filled teeth (FT – 2.14) and caries (DT – 1.17). In 2001 study 56.93% of the examined children had healthy periodontal condition, gingival bleeding – 41.2%, dental calculus – 1.87%. In 52.22% of the examined children in 2011 had healthy periodontal tissue, but gingival bleeding was detected in 42.3% of the children, respectively. Dental calculus was found in 5.26% of the children.
Conclusions:

1 In accordance with WHO data, the prevalence of caries among 12-year-old children in Latvia shows an average score.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

2 The largest part of DMFT index structure comprises filled and decayed teeth.
3 Gingival bleeding is the most common periodontal pathology in 12-year-olds in Latvia.

P595
Clinical Epidemiological Analysis of Carabelli, Paramolar Tubercles in Turkish Population
Mağrur Kazak
Department of Restorative Dentistry, Istanbul Aydin University, Istanbul, Turkey

Individual teeth vary remarkably in size, form, root shape, cusps. These characteristic differences occure not only among individuals, more importantly, among populations. Aim of this study is to analyse the prevelance of carabelli and paramolar tubercles in Turkish population according to age, gender, ethnic background and genetic predisposition.
Materials and methods: In this study, 145 patients (47 male, 98 female) in between age of 15–65 (mean age 34.70 ± 10.81 year old) were analysed clinically according to the presence of carabelli and paramolar tubercles in molar teeth. Gender, date of birth, homeland and any family member having company during this dental visit were asked to patients and marked on questionare forms. Also, dental examinations of these patients were done for detecting carabelli and paramolar tubercles in the maxillary and mandibulary molars. All datas were statistically analysed by SPSS 15.0 programme, Chi-Square and Fisher's Exact Chi-Square tests.
Results: Carabelli tubercles were determined in 44.1% (n:64) of the cases. Fifty percent (n:32) of carabelli tubercles were bilateral. Paramolar tubercles were determined in 6.9% (n:10) of the cases. Thirty percent (n:3) of paramolar tubercles were bilateral. Eight percent (n:8) of paramolar tubercles were detected in mandibula instead of maxilla. The frequency of paramolar and carabelli tubercules according to gender, ethnic background and genetic predisposition were not statistically significant ($p > 0.05$).
Conclusions: Paramolar tubercles can be noticed unexpectedly on the mandibulary molars instead of maxillary molars as well. More reseraches needed to detect this difference among populations to understand the role of genetic factors.

Theme: Preventive Dentistry: Orthodontics

P596
Dental Arch Dimensions in Yemeni Aged between 10 and 15 years
Nasr Hamid Alqudaimi[1], Fadhel Ali Alsanabani[2]
[1]*Department of Orthodontic, Thamar University, Yemen,*
[2]*Department of Conservative Dentistry, Thamar University*

Purpose: To assess the dental arch dimensions of Yemeni children aged (10–15) years, which is important to clinicians in orthodontics.
Methods: The sample was divided in to two groups, mixed dentition group aged (10–12) years divided into normal occlusion group (50 females,50 males) and class I with anterior dental crowding group (50 females, 50 males). Permanent group aged (13–15) was divided into normal occlusion group (50 females, 50 males) and class I with anterior dental crowding group (50 females, 50 males). Studying models form the upper and lower arches were constructed and evaluated to for upper and lower arches measurements by study models by scanner, digitizing and analyzing the data by a software program. Thirteen linear distances were utilized, which represented the dental arch width, length, segmental and palatal measurements.
Result and conclusion: The study found greater mean values for most of maxillary and mandibular arch dimension than class I with anterior dental crowding group in both mixed and permanent dentition. In the mixed dentition females and males, there is no significant difference in the majority of the measured dental arch dimensions. However, most of dental arch widths, and arch perimeter showed a significant difference between females and males, In permanent dentition, while no significant difference between females and males in arch lengths in both normal occlusion and class I with anterior dental crowding.

P597
Treatment of a Malocclusion Class III Associated with Open Bite with GEAW
Honorato Vidal, Armandino Alves, Claudia Pinto, Alexandra Reis, Marta Alves
Universidade Católica Portuguesa – Centro Regional das Beiras

Introduction: The Class III with open bite malocclusion is difficult to correct, often involving the need for orthognathic surgery. In these anomalies, the position and inclination of the occlusal plane are particularly affected by posterior occlusal vertical dimension. Thus, when the occlusal plane is more horizontal, a malocclusion of class III can develop due to anterior rotation of the mandible. The elimination of the discrepancy and the reconstruction of the occlusal plane should be the key objectives in the treatment of this anomaly.

GEAW (Gum Metal edgewise archwire therapy) is an evolution of MEAW technique, by using Gum metal, a superelastic alloy, that can be bended.
Case: The patient is a young adult woman, with a Class III skeletal pattern and skeletal open bite, dolichofacial, and with maxillary and mandibular crowding. She was orthodontically treated using the GEAW technique.

Orthodontic treatment with GEAW allowed to correct a complex malocclusion, without orthognathic surgery. It was observed, beyond the correction of occlusion, an improvement in the profile and facial aesthetics.
Conclusion: Class III with open bite malocclusions are usually quite complex and often need to be treated using orthognathic surgery.

The control of the occlusal plane allows us to deal properly with this type of malocclusion, attaining stability, without using orthognathic surgery, when the facial profile is favorable. The use of Gum Metal facilitates orthodontic treatment with the MEAW technique because it eliminates the need of complex loops.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

P598

The Effects of Pluronic and VEGF Applications on Bone Formation in Interpremaxillary Suture During Orthodontic Sutural Expansion by using CBCT

Hilal Karamehmetoglu[1], Abdullah Ekizer[2], Aysegul Dogan[3], Ahmet Ercan Sekerci[4]

[1]Department of Orthodontics, Bezmialem University, Istanbul, Turkey, [2]Department of Orthodontics, Erciyes University, Kayseri, Turkey, [3]Department of Genetics and Bioengineering, Yeditepe University, Istanbul, Turkey, [4]Department of Dento-Maxillofacial Radiology, Erciyes University, Kayseri, Turkey

Aim: The aim of this experimental study was to evaluate the effects of Pluronic and VEGF on bone formation in response to expansion of the interpremaxillary suture in rats by using Cone Beam Computed Tomography (CBCT).

Materials and methods: Thirty-six male, 50- to 60-day-old Wistar rats were divided into four equal groups (control and experimentals). Both groups were subjected to expansion for 5 days, and 50 cN of force was applied to the maxillary incisors with helical spring. The retention period lasted for 10 days. Experimental groups were treated with single-dose of Pluronic, VEGF and Pluronic+VEGF in the mid-palatal suture locally and nine control animals received physiologic saline solution. The mean bone density values in hounsfield unit (HU) of the newly formed bone were recorded using Mimics 10.1 image analysis software (Materialise NV, Leuven, Belgium). Wilcoxon signed ranks test was used for statistical evaluation.

Results: Significant differences were found between experimental groups and control group. New bone density values showed higher values in the Pluronic ($p = 0.008$, 1.21-fold), VEGF ($p = 0.038$, 1.11-fold), Pluronic+VEGF ($p = 0.011$, 1.35-fold) than the control.

Conclusion: Bone radiological measurements revealed that bone architecture in the experimental groups was improved and positive effects on early phase of bone regeneration in the premaxillary suture in response to expansion and may be beneficial in routine maxillary expansion procedures.

P599

Prediction of Lower Third Molar Impaction Using Lateral Cephalometric Radiographs

Loredana Golovcencu[1], Daniela Anistoroaei[1], Dana Cristiana Maxim[2]

[1]Orthodontics, University of Medicine and Pharmacy "Gr.T.Popa", Iasi, Romania, [2]Paediatric Dentistry, University of Medicine and Pharmacy "Gr.T.Popa", Iasi, Romania

Aims: This study was designed to investigate the reliability of lateral cephalometric films measurements regarding the risk of third lower molar impaction in adolescents who undergone orthodontic treatment.

Materials and methods: The study sample consisted of 78 adolescent orthodontic patients divided into nonextraction treatment group and lower first premolars extraction treatment group. Standardized lateral cephalometric radiographs were taken for each patient before and after orthodontic treatment. On lateral cephalometric films we measured the available space for lower third molar eruption, the angle between the third molar long axis and the mandibular plane and the angle between the tangent to the occlusal face of the lower third molar and the palatal plane. Comparative and correlative analysis were performed between the groups.

Results: There was a 16.7% increase in lower third molar chances for eruption post orthodontic treatment in the nonextraction group, comparative to 14.2% in the extraction group considering the available distal space. The angle formed by the long axis of the tooth with the mandibular plane increased with 5.84° in the extraction group and decreased with 3.45° in the nonextraction group at the end of the orthodontic treatment. The angle formed by the tangent to the occlusal face of the lower third molar with the palatal plane decreased with the same amount in both groups.

Conclusions: Lateral cephalometric radiograph is a reliable investigation for lower third molar prediction and the orthodontic treatment with or without first lower premolar extraction has little or no influence on third lower molar eruption.

P600

Camouflage Therapy in an Class II Patient with Extraction of Maxillary First Premolars

Hatice Ademoglu, M. Hakan Türkkahraman

Department of Orthodontics, Suleyman Demirel University, Isparta, Turkey

Aim: To show the results of orthodontic treatment of skeletal and dental class II malocclusion in an adult patient.

Subject and methods: A 17 year old female with an unpleasant dental aesthetics, increased overjet and minimum crowding in the maxillary and mandibular arch. Pretreatment examination showed that she was in the permanent dentition stage, the molar relationship was full cusp class II on the right side and half cusp class II on the left side, the maxillary and mandibular incisors were proclined, overjet was 9 mm and overbite was 1 mm. Treatment started with extraction of the maxillary first premolars to allow space for the reduction of the overjet, upper and lower fixed appliances were used. Extra-oral traction was used as a part of treatment to reinforce the posterior anchorage. The total orthodontic treatment time was 28 months.

Results: At the end of treatment an optimum functional occlusion, aesthetic smile and facial profile was achieved.

Conclusion: In adult patients who have a moderate skeletal class II malocclusion camouflage therapy is commonly used and satisfactory aesthetic and functional treatment outcomes are achieved.

P601

Prevalence of White Spots in First Molars of Orthodontic Patients

Celjana Toti[1], Dorjan Hysi[1], Etleva Qeli[1], Almiro Gurakuqi[3], Elizana Petrela[2]

[1]Faculty of Dental Medicine, University of Medical science, Tirana, Albania, [2]Faculty of Public Health, University of Medical Science, Tirane, Albania, [3]Dental Clinic Toti Gurakuqi

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: The aim of the study was to evaluate the prevalence and distribution of white spots in first molars in patients after debonding compared with the patients in need for orthodontic treatment.
Methods and materials: Sample size n = 24 patients scheduled for fixed orthodontic treatment were selected as control group (A) and n = 22 patients finished 2 year fixed orthodontic treatment were selected as study group (B). The same GIC cement was used to fix molar bands. The age distribution was 12–18 years old. Written permission received from the parents was part of the dental chart. The buccal surfaces of the first molars in each quadrant were examined for the presence of white spots in both groups.

Hi-square statistical test was used to analyze the differences between groups.
Results: The number of white spots in group A was 10 (10.4%) and in group B was 15 (17%) with a statistically difference between them ($p = 0.041$). The distribution of white spots for group A was 4 (8.3%) on maxillary molars and 6 (12.5%) on mandibulary molars without any differences ($p = 0.063$). The distribution of white spots for group B was 6 (13.6%) on maxillary molars and 9 (20%) on mandibulary molars, with a statistically difference between them ($p = 0.039$).
Conclusion: The results showed a significant higher prevalence of white spots in group B which emphasizes the influence of orthodontic appliances in increasing white spots. The number of white spots was higher in mandibular molars than in maxillary molars.

P602
A Cephalometric and Study Model Evaluation of Class II Div 1 Patients with Different Facial Types
Arun S. Urala
Dept. of Orthodontics & Dentofacial Orthopaedics, Manipal College of Dental Sciences, Manipal, Manipal University, Manipal – 576104, Karnataka, India

Aim or purpose: The aim was to test the hypothesis whether a change in the sagittal position and the transverse dimension of the dental arches in Class II division 1 patients varied according to the facial type.
Materials and methods: Lateral cephalograms of 111 Class II division 1 patients were divided into 3 groups (hypodivergent, normodivergent and hyperdivergent). The inter-canine and molar widths were measured on study models using a digital caliper (Mitutoyo, Japan). The mean of all parameters were compared using ANOVA followed by post-hoc test.
Results: A statistically significant difference ($p < 0.001$) was noted in the mean Pog-Na Pp of the hyperdivergent group and mean SNA and SNB angles between the groups.
Conclusion: The sagittal component was the only factor that varied between the facial types. There was no difference in the transverse dimension between the groups.

P603
Evaluation of Face on Third Dimension: Pal 3D Cephalometric Analysis
İlhan Metin Dağsuyu
Department of Orthodontics, Eskisehir Osmangazi University, Eskisehir, Turkey.

Introduction: Orthodontics treatment planning is an effort of to understand and to solve the dento-facial problems. Development of imaging technologies serves the oppurtunity of to evaluate real three dimensional anatomical structures on third dimension, virtually. Pal 3D is a new cephalometric analysis system based on multiplanar assessments of hard and soft tissues on cranio-facial reconstructions.
Case: In this report, diagnostic capabilities of the comprehensive dento-facial analysis system including specialized landmarks, reference planes and measurement parameters were presented with different clinical studies.

P604
Orthodontic Treatment of Maxillary Deficiency of Cleft Lip and Palata Patient at Pubertal Stage: Case Report
Alev Aksoy
Department of Orthodontics, Süleyman Demirel University, Isparta, Turkey

Aim: Moderate to severe occlusal discrepancies and Dentofacial Deformities in adolescents usually require combined orthodontic treatment and Orthognathic Surgery to obtain optimal, stable, functional and esthetic results. Therefore Slow Maxillary Expansion is suggested for the Cleft Lip and Palate Patients before orthodontic treatment. The aim of this study is to present the treatment of a 12 years-old female patient by slow maxillar expansion by removable appliance with Bertoni screw in the middle followed by fixed appliances.
Subject and methods: The 12-year old female has applied to our clinic due to aesthetic and feeding problems. According to the clinical and radiographic evaluation of the patient, maxillary transverse and saggital deficiencies were inspected. The molar relationship was Class I and there were no canine relationship, no overbite and negative overjet. The patient was skeletally Class III. The treatment plan was to perform slow maxillary expansion combined with fixed orthodontic treatment.
Results: The treatment duration was 36 months and at the end of the treatment wide maxillary satisfactory dental relationships were achieved.
Conclusion: Functional occlusion along with aesthetic smile was obtained with slow maxillary expansion and orthodontic treatment in the mouth of a girl at pubertal age with maxilary deficiency Class III skeletal deficiency.

P605
Cleidocranial Dysplasia: A Case Report
Mihri Amasyalı
Department of Orthodontics, Military Hospital, Kütahya, Turkey

Introduction: Cleidocranial dysplasia (CCD) is a skeletal dysplasia characterized by delayed closure of the cranial sutures, hypoplastic or aplastic clavicles, and multiple dental abnormalities. The most prominent clinical findings are abnormally large, wide-open fontanels at birth that may remain open throughout life; mid-face hypoplasia; abnormal dentition, including delayed eruption of

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

secondary dentition, failure to shed the primary teeth, supernumerary teeth with dental crowding, and malocclusion.
Case: A 20 years old male patient was referred to our clinic because of his missing teeth. Patient's height was 148 cm and in the physical examination it was determined that he had long neck and narrow and low shoulders. The patient was able to join his both shoulders in front of the body depending on the aplasia of the clavicula. The patient mentioned that his father and little sister had the same orthopedic problems. Extraoral examination showed brachiocephalic head and face, low nasal bridge, wide and prominent forehead. The bones of the midface were too small leading to an appearance like prognathism. Intraoral and radiographic evaluation revealed persistent deciduous teeth and 16 of the permanent teeth were impacted. Some of the impacted teeth were still at the germ stage.
Conclusion: The clinical findings of CCD are often undiagnosed although it is present at birth. It will be diagnosed later in life by incidental findings by physicians or dentists. Thus a multidisciplinary approach can help the patient in proper mastication and esthetics and therefore fulfilling the functional need of the patients.

P606
The Three-Dimensional Evaluation of Nasal and Pharyngeal Airway after LeFort-I Maxillary Distraction
Sıla Mermut Gökçe[1], Serkan Görgülü[1], Ümit Karaçaylı[2], Hasan Suat Gökçe[3]
[1]Department of Orthodontics, Gulhane Military Medical Academy, Ankara, Turkey, [2]Department of Maxillofacial Surgery, Gulhane Military Medical Academy, Ankara, Turkey, [3]Medical Design and Manufacturing Center, Gulhane Military Medical Academy, Ankara, Turkey

Aim: Distraction osteogenesis (DO) is a method of enhancing bony deficiencies of the hypoplastic maxilla. In the study, it was aimed to evaluate the skeletal, dental, oropharyngeal airway and nasal passage volume changes that occur after LeFort-I maxillary DO (LeFort-I MDO).
Materials and methods: The LeFort-I MDO group consisted of seven male patients (mean age: 25.5 years) with severe skeletal Class-III anomalies related to maxillary retrognathie, excessive increased negative overjet (mean: 11.43 mm) with anterior and/or posterior cross bite. Lateral cephalograms, photographs, dental casts and computed tomography were obtained and analyzed at presurgery and more than 6 months (mean:7.1 months) postsurgery. All CT records were transferred to the computer with the software SimPlant (Materialise, Belgium) to obtain the three-dimensional virtual models. On virtual models, maxillary complex, nasal cavity and pharyngeal areas were segmented separately due to the comparison the changes before and after the LeFort-I MDO.
Results: After the LeFort-I MDO, the maxilla was repositioned anteriorly average 9.5 mm (7.5–15.1 mm) on the sagittal direction parallel to the base of the cranium. As a result of the maxillary advancement, the mean increases of the volume of the nasal cavity (mean:3636 mm3) and the volume of the pharyngeal area (mean:2010 mm3) were statistically significant compared to the preoperative volumes ($p = 0.018$).
Conclusion: Orthognathic surgery is performed to alter the shape of the jaws to improve dental occlusion stability, improve temporomandibular joint function, open the oropharyngeal airway, and improve the patient's facial proportions. In all patients, LeFort-I MDO created a significant increase in nasal and pharyngeal passage volume.

P607
Management of Impacted Central Incisors In Pediatric Patients: Three Years Follow-ups
Barhan Pekel[1], Ferit Bayram[2], Ali Menteş[1]
[1]Department of Pediatric Dentistry, Marmara University, Istanbul, Turkey, [2]Department of Oral and Maxillofacial Surgery, Marmara University, Istanbul, Turkey

Aim: The aim of this presentation was to evaluate treatment outcomeof three pediatric male patients with impacted central incisors due to supernumerary teeth and their 3 years follow-ups.
Case: Case1: After clinical intraoral examination of O.A. (10 years) in Department of Pediatric Dentistry, Marmara University, Istanbul, a non-exfoliated primary maxillary central incisor was diagnosed. X-ray revealed supernumerary tooth as an obstruction for the eruption of his permanent successor. Following surgery, impacted tooth was bonded with an orthodontic button and treatment was followed 7 months with forced eruption appliance. The correct occlusion succeeded in a total of 11 months. Case2: Clinical and radiographical examination U.D. (8 years) revealed impacted maxillary central incisor due to odontoma. After surgical extraction and orthodontic forced eruption, proper alignment was recorded at 8 months. Case3: B.G. (10 years) was diagnosed with a supernumerary tooth in maxillary anterior region preventing eruption of maxillary permanent central incisor. Similar surgical and orthodontic procedures were followed. Eruption was seen in 3 months and completed in 8 months. All Patients were followed up to 3 years without any additional treatment.
Conclusion: This report demonstrated importance of early diagnosis of impacted teeth in pediatric patients. Early treatment of impacted teeth could be achieved by surgical extraction and forced eruption in less than 12 months and it reduced the extent of surgery, orthodontic and/or prosthodontic treatments and possible complications in later life. The behavior management of pediatric patients by a pediatric dentist had a significant impact for the surgical extraction under local anesthesia and long-term patient cooperation.

Theme: Preventive Dentistry: Periodontology

P608
IL-17 (H161R) and IL-23R (R381Q) Polymorphisms in a Turkish Population with Periodontitis
Hatice Ebru Olgun Erdemir[1], Meltem Hendek[1], Derya Beyza Sayın[2]
[1]Department of Periodontology, Kirikkale University, Kirikkale, Turkey, [2]Department of Medical Biology and Genetics, Kirikkale University, Kirikkale, Turkey

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: The aim of the study was to evaluate Histidine161Arginine (H161R) polymorphism of IL-17F gene and Arginine381Glycine (R381Q) polymorphism of IL-23R gene in patients with different periodontal disease and the associations of these polymorphisms with periodontal clinical parameters.
Methods and Materials: Ninety periodontal healthy, 90 patients with chronic periodontitis and 57 patients with aggressive periodontitis were included to the study. After all clinical periodontal measurements including probing depth (PD), clinical attachment level (CAL), plaque index (PI) and gingival index (GI) had been recorded, initial periodontal therapy including scaling and root planing, oral hygiene motivation were performed. Before the treatment, DNA was isolated from venous blood samples from each patients and genotype analysis were made for single nucleotide polymorphism.
Conclusion: The comparison of allelic, genotypic frequency of the IL-17F Histidine161Arginine (H161R) ve IL-23R Arginine381Glycine (R381Q) polymorphisms revealed no significant differences between the periodontal healthy and overall group with periodontitis. In conclusion, it was suggested that there was no association between the IL-17F (H161R) and IL-23R (R381Q) gene polymorphisms and patients with periodontal disease in Turkish population.

P609

Correlations between the Periodontal Modifications and the Oxidative Status on Periodontal Disease Patients

Martu Ioana, Luchian Ionut, Goriuc Ancuta, Foia Liliana, Martu Silvia
Gr.T. Popa Medicine and Pharmacy University, Iasi, Romania

The purpose of the study: Our study was centered on the comparative research of enzymatic and non-enzymatic oxidative status mediators in the crevicular fluid on chronic and aggressive periodontitis patients, compared to periodontally healthy subjects.
Methods: The study was conducted on 42 patients. They were divided in three study groups: chronic periodontitis subjects, aggressive periodontitis patients and periodontally healthy subjects. On marginal periodontitis patients, associated or not with systemic diseases, we initially collected gingival crevicular fluid and saliva samples and we evaluated the following enzymatic stress markers for all the three groups of subjects: superoxide dismutase, glutathione peroxidase, malondialdehyde, using the gingival crevicular fluid (GCF) as biologic material.
Results: The statistical analysis for the malondialdehyde in the control group, aggressive periodontitis group and chronic periodontits group shows significant differences between the groups.
Conclusions: The present study revealed significant statistic differences between most of the oxidative stress parameters analysed in the GCF, specially in the aggressive periodontitis group, less in the chronic periodontitis group compared to the control group.

P610

Periodontal Alteration and Correlation with the Plasmatic Levels of Lipides

Surdu Macovei Amelia, Martu Ioana, Foia Liliana, Rudnic Ioana, Martu Silvia
Gr.T. Popa Medicine and Pharmacy University, Department of Periodontology, Iasi, Romania

Scope of the study: evaluation of the extent of periodontal alteration, correlated with the plasmatic levels of cholesterol and of the metabolization time of plasmatic lipides.
Methods: The patients forming the experimental group were recruited sequentially, along 6 months, among those having addressed the private dental office for routine examinations. The experimental group included 39 patients affected with periodontal diseases, while the control group – 40 patients with ages between 50 and 60 years. There followed measurement of the ŕ jeun plasmatic lipids and of glucose concentrations from blood.
Results: The values of plasmatic triglycerides were higher in the patients of the experimental group, comparatively with the subjects of the control one (+39%), yet no difference has been registered for HDL cholesterol, while the mean plasmatic cholesterol levels and the LDL cholesterol levels in subjects suffering from periodontitis were significantly higher, with approximately 8 and 13%, comparatively with the control. The frequency of hypercholesterolemia in the first group of subjects was approximately double vs. the control.
Conclusions: The pathological levels of triglycerides were about 6.5 times more frequent in periodontitis, comparatively with the subjects of the control group, yet no differentce was observed for the HDL cholesterol level.

P611

Periodontal Status as a Risk Factor for Male Infertility

Zainah Mohammed Sambawa[1], Reema Suliman Almusallam[1], Fawzia Haif Alqhtani[1], Manal Fawaz Alnajar[1], Hadeel Fawaz Alnajar[1], Ghousia Sayeed Rahman[2]
[1]Riyadh colleges of dentistry and pharmecy Internship training departmentK.S.A Riyadh, [2]Riyadh colleges of dentistry and pharmecy periodontology department K.S.A Riyadh

Background and aim: An association has been demonstrated previously between periodontal diseases and various systemic conditions including pre term low birth weight babies, coronary heart disease and other systemic diseases. Apossible role of dental infection in male infertility has also been suggested.

aim of the present study is to examine the association between fertility parameter and periodontal status of men attending in vitro fertilization (IVF) clinics.
Material and methods: The study population consisted of 27 men attending Dallah Hospital Infertility Clinic and King khaled hospital for sperm analysis before homologue semen insemination or IVF. The quality of sperm was assessed according to WHO criteria and fertility is classified as either fertile or sub-fertile, according to three main parameters: sperm cell concentration, sperm cell motility and sperm cell morphology. and all results were recorded.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Clinical periodontal parameters recorded were gingival index, plaque index, PD, gingival recession and clinical attachment loss. Were identified as healthy, moderate or severe chronic periodontal disease.
Results: ANOVA multivariate analysis and Yates $\chi 2$ test used for examining a possible association between the tested periodontal and fertility parameters.

Patients were diagnosed as gingivitis (3.7%), moderate periodontitis (81.5%) and severe periodontitis (14.8%). According to semen analysis they were classified as normospermia (25.9%), oligozoospermia (22.2%), azoospermia (51.9%). High number of sites with deep periodontal pocket, CAL and number of missing teeth were significantly associated with sperm submotility.
Conclusions: These findings point to a possible association between male infertility, diminished semen quality and periodontal infections in men attending IVF Clinics.

P612

Relationship between Dental-Periodontal Conditions and Self-Reported Reflux Index: Early Results

Hüseyin Gencay Keçeli[1], Faik Yaylak[2], Hasan Hatipoğlu[3]
[1]*Department of Periodontology, Kirikkale University, Kirikkale, Turkey,* [2]*Department of General Surgery, Dumlupinar University, Kutahya, Turkey,* [3]*Department of Periodontology, Dumlupinar University, Kutahya, Turkey*

Aim: Gastroesophageal Reflux Disease (GERD) and Laryngopharyngeal reflux (LPR) are common community health problems which are known to effect the oral cavity. Subjective assessment of the symptom severity in the patients with GERD and LPR is possible with self "Reflux Symptom Index" (RSI). In this study, the possible relationship between dental/periodontal conditions and RSI scores were evaluated.
Methods: A preliminary prospective cross sectional study was performed with 124 dental outpatients (72 Female and 52 Male; aged between 18 and 62 years). Demographic and clinical variables and reflux symptom index (RSI – a nine item and 45-point scale questionnaire) score were evaluated. Dental and periodontal conditions were evaluated with DMFT index (decayed, missing, filled teeth) and Community Periodontal Index (CPI) scores. The correlation between variables in sub grouped patients and RSI scores (normal: RSI $\leq$ 13, abnormal: RSI > 13) were statistically examined.
Results: RSI subgroups were similar for DMFT and CPI scores ($p < 0.05$). In addition, RSI scores were not correlated with DMFT and CPI scores.
Discussion: Self- reported RSI merits further investigation before a conclusion to be declared to be suitable for the dental and periodontal evaluation of the patients with GERD and LPR.

P613

Prevalence and Serotype Distribution of Aggregatibacter Actinomycetemcomitans in Non-Periodontitis Subjects

Başak Doğan[1], Diane Anthony[2], Sinem Yıldız Çiflikli[1], Jason Chen[2], Jonathan Huang[2], Tanju Kadir[3], Casey Chen[2]
[1]*Department of Periodontology, Faculty of Dentistry, Marmara University, Istanbul, Turkey,* [2]*Division of Periodontology, Diagnostic Sciences and Dental Hygiene, Ostrow School of Dentistry, University of Southern California, Los Angeles, CA, USA,* [3]*Department of Microbiology, Faculty of Dentistry, Marmara University, Istanbul, Turkey*

Aim: To determine the prevalence and serotype distribution of Aggregatibacter actinomycetemcomitans in non-periodontitis subjects.
Materials and methods: Systemically healthy non-periodontitis 94 dental students who had not use of antibiotics within the last 3 months and not received any form of periodontal therapy within the last 6 months were included in the study. Pooled subgingival microbiological samples were collected from each subject with sterile paper points from 4 first molars and 4 central incisors. All samples were tested for the presence of *A. actinomycetemcomitans* through PCR analysis of the 16S rRNA genes in DNA extracted from the samples. *A. actinomycetemcomitans* isolates were serotyped using various genes specific to the different strains of the bacterium. To determine the specific serotype, each DNA sample was subjected to three different PCR assays for serotypes a/e, b/c/f, and d. The study design was approved by the Ethics Committee of Medical Faculty, Marmara University (MAR-YÇ-2009-0064).
Results: Of the 94 samples that were tested, 43 (46%) were positive for *A. actinomycetemcomitans*. Among the 43 *A. actinomycetemcomitans* -positive samples, the serotype was identified only in 31 of the samples. Twenty-five were positive for *A. actinomycetemcomitans* serotype a (81%), 1 for serotype b (3%), 1 for serotype c (3%), and 4 for serotype f (13%), while serotypes d and e were undetectable.
Conclusion: The large percentage of subjects exhibiting *A. actinomycetemcomitans* serotype a suggested a strong association between non-periodontitis Turkish individuals and serotype a.

P614

Interface (Lichenoid) Oral Mucositis

Seda Aycan Altan[1], Vahdi Umut Bengi[1], İbrahim Yavan[2], Işıl Saygun[1]
[1]*Department of Periodontology, Gulhane Military Medical Academy, Ankara, Turkey,* [2]*Department of Pathology, Gulhane Military Medical Academy, Ankara, Turkey*

Background: In literature, several studies have been reported that many systemic disorders shows their symptoms in oral mucosa. They may be manifested pathologically changed structures caused by organic or psychological factors. Early symptoms which occur within the oral cavity may emerge with diseases related to our blood serum levels, gastrointestinal or mental system. Chronic stomatitis is a condition characterized by chronic, painful oral lesions. In this case report we present possible ethylogical factors of oral mucosal manifestations such as interface oral mucositis.
Case: A 28 year old female patient who was suffering from pain and burning sensation of lesional oral mucosa referred to The Department of Periodontology. She had life event psychological stress, her diet was insufficient and these complaints have been increased for 3 months. She has been taken hypothyroid treatment for 3 years. Intraoral examination revealed white reticular lesions under her tongue and desquamative, erythematous areas at her

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

posterior mandibullar keratinized gingiva. She was periodontally healthy. Histopathology of keratinized gingival lesion revealed lichenoid, eruptive stomatitis as interface mucositis. Biochemical analysis showed decreased B12 vitamin levels. In treatment, her new toothpaste has been changed as a possible contact stomatitis diagnosis and drug administration of vitamin B complex has been recommended. After 2 weeks, all symptoms were dissappeared.
Conclusion: In differential diagnosis, clinicians should consider multiple ethylogical factors such as malnutrition, stress and local factors including toothpaste, oral rinses and gums may have a role in occurance of oral mucosal lesions.

P615
Gingival Health Assessment Using Two Gingival Indices
Ilma Robo[1], Edlira Sadiku[2]
[1]*Department of periodontology, Albaninan University, Tirana, Albania,* [2]*Private Clinic, Tirana, Albania*

Aim: To enable comparison of specific groups of the population, at a certain time, to support the definition and control of risk factors and to evaluate the effectiveness of periodontal treatment, gingival health and its level should be determined as accurately.
Materials and methods: In 10 patients were collected values of the two indexes for mandibular anterior teeth, only vestibular area. Patients were selected that had not lack of teeth in the mandibular anterior area. They were evaluated for both indices: Löe-Silness gingival index and gingival bleeding Mühlerman index, for each individual tooth and for the patient in total.
Results: Both indices were compared between them on each patient. Sensitivity of gingival index was only with a value below the value assessment of gingival bleeding index.
Conclusions: Only experience, care and attention are grounds to take into consideration subjective signs such as edema and gingival color, which are basic elements gingival index assessment. At the initial appearance of inflammation, bleeding is the determining factor and the second sign after the increased gingival fluid. We can not think of mathematical relation between the two indices, but both must be used simultaneously for statistical evaluations of the same patient.

P616
Conventional Versus Laser-Assisted Therapy with Aggressive Periodontitis
Mirjana Popovska[1], Milco Ristovski[2],
Aneta Atanasovska Stojanovska[1], Linda Zendeli Bedzeti[1], Kristina Mitic[1], Vera Radojkova Nikolovska[1], Ana Belazelkovska[1], Svetlana Strezovska[3]
[1]*Department of Oral Pathology and Periodontology, Faculty of Dentistry, University Ss.Kiril and Methodius, Skopje, Macedonia,* [2]*Institute of Pathology, Faculty of Medicine, University Ss.Kiril and Methodius, Skopje, Macedonia,* [3]*Private Dental Clinic, Idadia, Skopje*

Aim: To evaluate tissue response in aggressive periodontitis (AgP) after conventional and conventional supplemented with laser-assisted therapy.
Methods and materials: This study included 50 subjects with AgP, aged 10–24 year, which were divided into two subgroups. First subgroup 25 subjects treated only with conventional therapy (CP) and second subgroup of 25 subjects which were treated with laser assisted therapy (CP-LA). Low-level diode laser (630–670 nm, 1.875 J/cm) was applied, each sextant for 4 min, Scorpion C- 405 7A. The control group consisted of 20 individuals, aged 13–24 years, without signs of periodontal disease. Gingival tissue biopsies were obtained from the controls and from the study group before and after conventional and with laser assisted treatment. Tissue specimens were embedded in paraffin and cryostat procedures were performed.
Results: Subject with AgP revealed heterogeneous inflammatory infiltrate with dense and less dense areas. Mean values for study group before treatment were 39.18 ± 14.02. For the first subgroup mean values ranged 35.92 ± 14.02, and mean values for the second subgroup were 35.01 ± 13.25. Qualitative analysis in study group after conventional witout and with lasser assistene revealed insignificant values of mononuclear and plasma cells and Russell bodies.
Conclusion: Laser application did not induce quantitaive nor qualitative changes in the gingival tissue inflammatory infiltrate in study group. On the basis of our findings we suggest that low level laser assisted therapy does not proof to be efficient in the treatment of aggressive periodontitis.

Key words: aggressive periodontitis, low-level diode laser, gingiva, periodontal therapy.

P617
Free gingival Graft Dimensional Changes in the Anterior Mandible
Emine Çiftçibaşı[1], Cenker Zeki Koyuncuoğlu[2], Ezgi Düzagaç[1], Emrah Genceli[1], Volkan Karabey[1], Serdar Çintan[1]
[1]*Department of Periodontology, Faculty of Dentistry, Istanbul University, Istanbul, Turkey,* [2]*Department of Restorative Dentistry, Faculty of Dentistry, Istanbul Aydin University, Istanbul, Turkey*

Background: There is no absolute minimum amount of attached gingiva required for gingival health to be maintained. However, there are several clinical situations which augmentation with autogenous grafts might be indicated. The aim of this study was to evaluate shrinkage of free gingival graft (FGG) dimensions during the healing period of 3 months and impact of keratinised tissue width gained by FGG on gingival inflammation parameters.
Materials and methods: Thirty localized recessions of Miller Class I to II were treated with FGG in 30 systemically healthy and non-smoker patients. Plaque index (PI), gingival index (GI), probing depth (PD), clinical attachment level (CAL), keratinized tissue (KT), vertical recession (VR), horizontal recession (HR) and FGG dimensions were assessed baseline and 30, 90 days postoperatively.
Results: At 3 months, non-significant alterations of PI, GI, PD and CAL were observed. KT increased significantly from baseline ($p < 0.01$) at days 30, and 90. Horizontal graft shrinkage was not statistically significant compared baseline to 30 days. However, vertical graft reduction was statistically significant at same

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

time-points. Calculated graft area was significantly reduced during the study period at all time-points compared to the baseline ($p < 0.001$).
Conclusion: FGG procedure is quite practical to get prominent increase of keratinised tissue width. Vertical graft shrinkage seems to affect the clinical outcomes of the FGG procedure.

Theme: Preventive Dentistry: Public Health

P618
Effect of New Disinfectant to Biofilm in Dental-Unit-Water-Line
Masanori Ikeno, Masako Nakano Hasegawa, Ayuko Takao, Toshiko Ozawa, Noriyasu Hosoya, Nobuko Maeda
Tsurumi University School of Dental Medicine

Aim: The antibacterial effect of new disinfectant, a test mixture containing sodium percarbonate, to heterotrophic organisms forming biofilm was evaluated.
Materials and methods: Microplate assay: Test bacterial strains isolated from dental-unit-water were inoculated to R2A broth in each well on a microplate. After 5-day-incubation at room temperature, the wells were washed and treated with the disinfectant. Bacterial survival was evaluated by fluorescent increment of Alamar-Blue, a detector of REDOX activity.

Disinfectant test using a water line tube of a dental unit: A water line tube with biofilm was taken from a dental unit clinically used and cut into 5 mm-fragments. Each of the tube fragments was immersed into the disinfectant and then cultivated for up to 10 days in R2A broth to detect bacterial survivors.
Results and discussion: A 5 min treatment with 3.3% of disinfectant solution was effective to biofilm formed on microplate. However, for disinfection of the tube fragments, this condition seemed to be insufficient for complete killing of the bacteria. No bacterial growth was detected after 30 minures-treatment. Therefore change of treatment time and/or disinfectant concentration should be considered.
Conclusion: The disinfectant was effective to both model biofilms, on microplate and the "native" biofilm formed on the inner surface of a dental unit tube. The optimum condition for disinfection while minimizing the influence to dental unit material should be established.

P619
Oral Health Knowledge and Practice among Pilgrims Visiting Medina
Omar Saeed Bahakam, Hussam Abdullah Al Ofi, Mansor Malik Hakeem
Taibah University, college of dentistry

Introduction: Medina is the second holiest city in the Islamic religion after Mecca. Millions of pilgrims visit the city each year from different parts of the globe for spiritual reasons.
Aims:
1 To determine the oral health knowledge and practice amongst pilgrims visiting Medina.
2 To compare the knowledge and practice amongst the different pilgrims.
Methods: This was a cross sectional descriptive study. The pilgrims were divided into six groups; Saudi Arabia, other Arab countries, Indian subcontinent, Turkey, Iran and Europe and the questionnaire was translated into six languages. The questionnaire was administered by the interviewers directly and no names were recorded. The data was analyzed using the SPSS 15 statistical package.
Results: A total of 600 pilgrims were included in the study; 340 (57%) males and 260 (43%) females and the average age was 36 years old. Of these, 42% reported brushing their teeth twice daily using a toothbrush and toothpaste. Regarding the knowledge about the benefits of fluoride in preventing dental caries, 80% Iranians knew the correct answer. The majority of respondents (70%) reported to visit the dentist only when necessary.
Conclusion: The overall knowledge regarding oral health was acceptable. In general, respondents from developed countries showed a greater level of oral health knowledge compared to the others. Pilgrims from Iran showed the greatest knowledge regarding oral health behavior and practices.

P620
Efficiency of Different Toothpastes for Children in Improving Gingival Health
Tatiana V. Kupets[1], Svetlana K. Matelo[1], Alexander I. Jardetsky[2], Alexander S. Rusak[2]
[1]*WDC Laboratories, Moscow, Russia,* [2]*Belarusian State Medical University, Minsk, Republic of Belarus*

Objectives: Our previous experience shown that school – supervised toothbrushing program is effective for achievement of good oral hygiene in children, however, there are fewer reports on the effectiveness of different toothpastes. The aim of this study was to evaluate oral hygiene and gingival health in 6–7-year old children in 9-month program of supervised toothbrushing with fluoride – containing and fluoride-free toothpastes.
Methods: Ninety-eight children in one school (A) were assigned to brush their teeth with a fluoride – free toothpaste; 110 children in other school (B) – with a F-1000 ppm toothpaste daily in schools under supervision of teachers,
Results: The initial level of OHI-S in "A" was 1.74 + 0.37 SD; in "B" – 1.71 + 0.32 ($p > 0.05$). The mean GI were 0.78 + 0.39 and 0.76 + 0.30 ($p > 0.05$) in "A" and "B" groups correspondly. After 9 months OHI-S was improved by 53% in "A" and by 50% in "B" to levels of 0.82 + 0.20 and 0.86 + 0.36 correspondly ($p < 0.01$). The mean GI had decreased by 40% to level of 0.47 + 0.11 in "A" and by 43% to level of 0.43 + 0.38 in "B" group ($p < 0.01$).
Conclusions: Toothbrushing with fluoride-containing and fluoride-free toothpastes were equally effective in improvement of oral hygiene and gingival health of young school children for the 9-months period of the supervised oral hygiene trial in schools.

P621
Prevalence of Musculoskeletal Disorders among the Czech Dental Practitioners
Zdenka Sustova[1], Martin Kapitan[1], Lenka Hodacova[2]
[1]*Charles University in Prague, Faculty of Medicine in Hradec Kralove, Department of Dentistry,* [2]*Charles University in Prague, Faculty of Medicine in Hradec Kralove, Department of Social Medicine*

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Aim: The aim is to present results of the questionnaire survey concerning MSDs conducted among dentists in the Czech Republic.
Methods: Dental practitioners filled in the questionnaires during educational events from November 2010 to September 2011. The questionnaire consisted of three parts. The first part included general information about the respondents, the second part concerned the characteristics of workplace and the last part involved the prevalence of MSDs. Collected data were statistically analysed.
Results: A total of 581 (72.6%) out of 800 questionnaires were returned. A total of 96.9% (n = 557) of respondents stated at least one kind of MSD regardless its intensity in the last 12 months. 30.6% (n = 176) of respondents identified their pain as mild. Middle or strong pain was declared by 66.3% (n = 381) of all respondents; by 69.3% (n = 287) of women and 58.4% (n = 94) of men. This difference between men and women was statistically significant (chi-square test, p = 0.012744). Of the respondents with middle or strong pain 22.6% (n = 86) decreased their work load for MSDs during the last 12 months. Of the dentists with middle or strong pain 86.9% (n = 331) treated themselves by doing exercises, 48.6% (n = 185) by medicaments and 46.7% (n = 178) turned for help to a specialist. The most often MSDs were pain in cervical spine, back and shoulders.
Conclusions: The prevalence of MSDs is quite high among the dentists in the Czech Republic, mainly in women.

P622
Patients' Oral Cancer Awareness and Perceptions of Oral Cancer Screening
Ülkem Aydın
Department of Dentomaxillofacial Radiology, Baskent University, Ankara, Turkey

Aim: To assess dental patients' oral cancer awareness, and attitues towards having a screening with a direct visualization device.
Materials and methods: In this cross-sectional, descriptive study, a questionnaire consisting of 20 questions was administered to 50 dental patients aged eighteen and over. The first part of the questionnaire included questions about the socio-demographic features of the patients; the causes, signs and symptoms, diagnosis and treatment of oral cancer. After informing all the participants about the method, patients who accepted to do so, were examined using the direct visualization device. The second part of the questionnaire included questions on attitues and feelings towards oral cancer screening. Frequency distribution test was used in statistical analysis.
Results: Fourty-four percent of the study participants had never heard of oral cancer. Smoking was the most frequently identified cause and ulceration was the most frequently identified symptom. Only eight percent of the study participants had heard of oral cancer screening with a direct visualization device but they would accept to be scheduled for follow-up (96%) or biopsy (84%) if a suspected lesion is detected.
Conclusion: Patients seem generally unaware of oral cancer and oral cancer screening but attitudes to screening were positive. We need to use this information to initiate public education programs for increasing oral cancer awareness and to facilitate early detection.

P623
Oral Hygiene Status, Awareness and Practices among Almajirs in Maiduguri
Amina Mohammed Ali, Hamman Mohammed Sani, Rabiu Ahmed Sani
Department of Dentistry, University of Maiduguri Teaching Hospital, Maidugri, Nigeria

Aim: To asses the oral hygiene status, awareness and practices among almajiris who constitute a large population of underprivildged children in northern Nigeria; about seven million (Moses. T Aluaigba, Circumventing or Superimposing Poverty on the African child?, Childhood in Africal 2009| Vol.1.No.1.| pp19–24), as no such study has ever been carried out before in Nigeria.
Materials and methods: The study is an analytic observational study carried out over a period of 6 days, between the 6th-11th of February 2012 on a total of two hundred and sixteen (216) almajiris from four (4) randomly selected locations in Maiduguri. Each almajiri was administered a self-administered questionnaire by the researchers which consisted of biodata, demographic data, and sections to asses their oral hygiene status, awareness and practices, and dental examination was carried out. The questionnaire was analized using the standard package for statistical analysis for social sciences software (SPSS).
Results: The level of oral hygiene awareness among almajiris is poor, most of them use chewing sticks to clean their mouths and have poor oral hygiene.
Conclusion: Almajiris constitute a significant population of underpriviledged children in northern Nigeria. Oral health awareness among them is poor because of lack of formal education. They mostly use chewing sticks because they can neither afford nor maintain toothbrushes and toothpastes and as such most of them have poor oral hygiene.

To improve their condition, it is recomended that the government improves asses to dental health services to the underprivildedged. The fight against child destitution should also be improved.

P624
The Role of Salivary Bacteria at Diabetes Management
Ayse Basak Cinar[1], Arzu Beklen[2], İnci Oktay[3], Lone Schou[1]
[1]School of Dentistry, University of Copenhagen, Copenhagen, Denmark, [2]Department of Periodontology, Faculty of Dentistry, Osmangazi University, Eskisehir, Turkey, [3]Oral Public Health Department, Yeditepe Dental Faculty, Yeditepe University, Istanbul, Turkey

Objectives: To assess the correlation between salivary bacteria and diabetes mellitus type2 (DM2) and obesity among patients with DM2.
Methods and materials: Baseline measurements from a prospective intervention study among DM2 patients (n = 186), Istanbul, were studied. The assessed clinical measures were streptococcus mutans, lactobacillus, number of teeth lost (maxilla), HbA1c, HDL, LDL and body-fat proportion. Patients having low number of Streptococcus mutans (<106) and lactobacillus (<106) were coded as "low salivary bacteria = 0". Taking the target levels (HbA1c < 6.5%,

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

high-density lipoprotein (HDL) >39 mg/dl, and low-density lipoprotein (LDL) <95 mg/dl) as cut-points, respective variables were dichotomized as "favourable" and "unfavourable". Descriptive statistics, frequency distributions, Chi-square tests and Factor analysis were applied.

Results: Most patients had low salivary bacteria (72%). The mean number of teeth-lost was 7.92 ± 6.04. Minority of patients had favourable diabetes-related measures [HbA1c (28%), LDL (30%)] except that a majority of patients reported favourable HDL (77%)]. The percentage of healthy body-fat proportions was low (37%). The patients with low number of salivary bacteria were more likely to keep their teeth (64%, p = 0.004). Those who had teeth-loss "below mean" were more likely to be in healthy body-fat range compared to those with "above mean" teeth loss (p = 0.048). Factor analysis revealed that those with high number of salivary bacteria were more likely to be in unhealthy fat-range and have high HbA1c.

Conclusions: The correlation between salivary bacteria and diabetes-related measures and obesity may underline that dentistry can play a major role in the prevention of further complications of DM2 and obesity by early diagnosis, with the use of salivary bacteria.

P625

Prediabets and type 2 Diabetes in Dental Patients: The Efficiency of Three Different Screening Approach

Rahşan Çevik Akyıl[1], Özkan Miloğlu[2], Nermin Olgun[3], İbrahim Şevki Bayrakdar[2]

[1]Söke Health High School, Adnan Menderes University, Aydın, Turkey, [2]Department of Dento-Maxillofacial Radiology, Faculty of Dentistry, Atatürk University, Erzurum, Turkey, [3]Department of Internal Medicine Nursing, Faculty of Health Science, Acıbadem University, Istanbul, Turkey

Aim: The aim of this study was to determine the prevalence of type 2 diabetes, impaired glucose tolerance (IGT), and impaired fasting glucose (IFG) with using random finger prick plasma glucose (RFPG) test in dental patients, and to compare the results of RFPG with that of Finnish Diabetes Risk Score (FINDRISC) and clinical guideline.

Methods: Six hundred and thousand and forty-four dental patients without diagnosed diabetes, nonpregnant adults, and ≥20 years of age participated to study. The basic screening tool was random finger prick plasma glucose test. This test was performed for each participant. The participants were referred to a physician according to the results of RFPG, or were not. Additional data tools were FINDRISC and clinical guideline developed for the dental patients.

Findings: The prevalence of previously diagnosed diabetes, type 2 diabetes, impaired glucose tolerance (IGT), and impaired fasting glucose (IFG) in dental patients was 8.3, 3, 0.7, and 0.3%, respectively. In regression analyses, age (p < 0.01), a family history of diabetes (p < 0.001), obesity (p < 0.01), and waist circumference (p < 0.001) were determined to be risk factors for type 2 diabetes. The correlation analysis showed that there were significant positive correlation between FINDRISC and clinical guideline (p < 0.001), and were negative correlation between RFPG and the other screening methods (p < 0.001 for each).

Conclusion: Finger prick plasma glucose test (RFPG), FINDRISC, and clinical guideline developed for dental patients were able to identify Type 2 diabetes and prediabetes in dental patients. However, we couldn't conclude that they were completely successful screening methods and they could be useful in dental setting.

P626

Atmospheric Radon Concentration Measurements at New Dental Faculty Buiding in Isparta, Turkey

Mehmet Ertan Kürkçüoğlu[1], Fatih Tozun[1], Işın Kürkçüoğlu[2], Derya Yıldırım[2]

[1]Süleyman Demirel University, Physics Department, Isparta, Turkey, [2]Süleyman Demirel University, Faculty of Dentistry, Isparta, Turkey

Aim: Radon, a radioactive and carcinogenic gas, can accumulate in enclosed spaces. Since inhalation of radon is related to the aetiology of lung cancer, it is important to determine the indoor radon levels in homes and workplaces. The aim of this study was to assess annual equivalent doses taken by the staff due to presence of radon in the new faculty building at University of Süleyman Demirel in Isparta, Turkey.

Materials and methods: 36 E-PERM (Electret Passive Environmental Radon Monitor) devices were placed in couples at different locations including clinics, laboratories, radiology rooms and offices. Atmospheric radon measurements were performed at each location by using short-term E-PERM detectors for approximately 50 h measurement time in February 2013.

Results: The analyses of detectors revealed that radon levels varied between 6 and 229 Bq/m3 and the average concentration at the faculty was found as 58 Bq/m3. The average annual effective dose received in the building was estimated as 0.41 mSv/year.

Conclusions: Within the limitations of this study it was found that, the observed radon levels in the new dental faculty building were lower than 1000 Bq/m3 that is the limit level for working places determined by TAEK (Turkish Atomic Energy Authority). Furthermore, the average dose taken by the dental staff was found to be less than the action levels of ICRP (International Commission on Radiological Protection).

P627

Odontogenic Bacteremia: A Secondary Endpoint in Oral Care and Dental Treatments

Nobuhiro Hanada, Yoshiaki Nomura, Hidenori Yamada, Erika Kakuta, Mayu Miyanohara, Takatoshi Murata, Tomoko Abo, Ayako Okada, Tomokazu Ueda, Hiromi Nomura, Akira Ida, Hiroaki Takeuchi

Tsurumi University School of Dental Medicine

Objectives: To date, a primary endpoint of oral care and dental treatment is restricted within oral region. However, recent evidence indicated that the oral health and diseases affect to general health. So, we are trying to set a secondary endpoint in dentistry.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation

Methods: We set up a new preventive dentistry, 3DS (Dental Drug Delivery System) dental clinic for outpatiants in our hospital. 3DS treatments were implemented to patients in order to prevent their odontogenic bacteremia.

Results: Evaluation of effect of 3DS treatments on prevention of odontogenic bacteremia were performed by ABI (ankle brachial pressure index) and baPWV. ABI is the ratio of the blood pressure in the lower legs to the blood pressure in the arms. Compared to the arm, lower blood pressure in the leg is an indication of blocked arteries (peripheral vascular disease or PVD). Pulse wave velocity (PWV), which is an index of arterial stiffness, was measured with form PWV/AVI (Colin/Omron, Japan). Arterial stiffness is one of the biggest predictors of coronary heart disease (CHD). We evaluated arterial stiffness by brachial-ankle pulse wave velocity (baPWV).

Conclusion: 3DS is a useful tool to prevent the damage of systemic blood vessel caused by everyday odontogenic bacteremia. A new preventive dentistry, 3DS dental clinic for outpatiants will change the concept of dental office in the world.

© 2013 The authors. International Dental Journal © 2013 FDI World Dental Federation