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Conference Programme and Abstracts

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Colgate

tooth was rotated 10º between each set of readings. Readings were taken through a coronal slice at the most bulbous part. Time of flight data was correlated to µCT images, permitting the velocity of sound to be derived. Independent t test was carried out on the data from each tooth and the experiment was repeated on one tooth to ensure reproducibility, paired t test.

Results: Ultrasonic scans on human teeth can produce cross-sectional images of teeth, which favourably compared with the µCT images. The mean of the ultrasonic velocity in enamel and dentine in human teeth were found to be 6293±383 and 3990±315 m/s respectively. Differences between mean speed of sound in the two teeth were not significant ($p>0.05$) and differences between repeated measurements on a single tooth were also not significant ($p>0.05$) at 20 MHz. Using a frequency of 20 MHz resolved enamel interfaces more clearly than the dentine pulp interface whilst a frequency of 10 MHz failed to resolve the enamel layer below a thickness of 0.48 mm.

Conclusions: Whilst this study is limited due to small sample size it demonstrates that ultrasound is a potential imaging tool. Each frequency, 10 and 20 MHz was able to resolve different aspects of the tooth structure.

0800 (111146)

Instant Whitening Effect of a New Silica Toothpaste. C.J. PHILPOTTS, and A. JOINER, Unilever Oral Care, Wirral, United Kingdom

Objectives: To measure the instant whitening effect of a new silica toothpaste containing blue covarine (Signal White Now) and compare with a range of commercial toothpastes *in vitro*.

Methods: Extracted human incisors and premolars were cleaned and placed in sterile saliva for two hours. After rinsing with water, baseline tooth colour was measured using a chromameter. The specimens were allocated to either a blue coloured commercial toothpaste (A to D) or a new whitening silica toothpaste, Signal White Now (E), n=6 for each group. The teeth were brushed for 1 minute with a toothpaste slurry (1:1:1 toothpaste:water:0.5% scmc) and rinsed with water before re-measuring tooth colour. Changes in tooth colour from baseline were calculated in terms of Delta b* which describes the yellow to blue colour shift shown to be associated with the perception of tooth whiteness.

Results: The changes in b* from baseline are shown below.

Toothpaste	Colour	Whitening paste	Delta b* (s.e)
A	Blue	yes	0.09 (0.05)
B	Blue	no	0.14 (0.12)
C	Blue	no	0.03 (0.05)
D	Blue	yes	0.05 (0.07)
E	Blue	yes	-0.47 (0.05)

Product E gave a greater reduction in yellowness and the product difference was of statistical significance (Tukey Kramer $p<0.05$).

Conclusions: Signal White Now (Product E) was the only product to show statistically significant reduction in b*, which is associated with the perception of tooth whiteness.

0801 (111380)

Toothpaste Abrasivity on Sound and Eroded Dentine *in vitro*. M. EVANS, C.J. PHILPOTTS, C. OLIMPIERI, and A. JOINER, Unilever Oral Care, Wirral, United Kingdom

Objectives: To measure the effect of toothpaste abrasivity on the wear of both sound and acid eroded dentine *in vitro*.

Methods: Human root dentine was mounted in epoxy resin, and planar polished to a Ra 0.3 microns using silicon carbide paper. Baseline profiles across the surface were measured using a contact surface profilometer. Two outer areas of the specimen were covered with tape to act as control regions. Specimens were stored in sterile saliva overnight and assigned to one of four treatment groups (n=8 for each group): control treatment (water 37oC, 5min), erosive challenge (0.3% citric acid pH 3.2, 37oC, 5min) and both groups were brushed for 10s in a linear brushing machine (300g load,150 cycles/min) using a slurry of either Toothpaste A (RDA 97) or Toothpaste B (RDA 204) (1:1:1 toothpaste:0.5%scmc:water). Specimens were rinsed with water and stored in sterile saliva for 2 hours. 30 treatment cycles were performed and the surface profiles across the test and control area of each specimen were remeasured.

Results: The mean dentine wear in microns for each treatment group is shown below.

Treatment	Toothpaste	Dentine Wear (microns) (s.e)
Water 37°C	A	3.11 (0.40)
Water 37°C	B	10.07 (0.95)
Citric Acid 37°C	A	10.90 (0.53)
Citric Acid 37°C	B	11.74 (0.88)

For treatment with water there was a statistical significance between Toothpaste A and B (Anova, Tukey Kramer $p<0.05$). For the acid eroded dentine there was no significant difference between Toothpaste A and B ($p>0.05$). Under erosive conditions dentine is removed to a similar degree irrespective of the RDA of the toothpaste.

Conclusions: The amount of dentine wear following an erosive and abrasive challenge is independent of the RDA of the toothpaste.

0802 (111163)

Longevity Effect of a New Silica Whitening Toothpaste. A. JOINER, and C.J. PHILPOTTS, Unilever Oral Care, Wirral, United Kingdom

Objectives: To measure the longevity whitening effect of a new silica toothpaste containing blue covarine (Signal White Now) and compare with a range of commercial whitening toothpastes *in vitro*.

Methods: Extracted human incisors and premolars were cleaned and placed in sterile saliva for two hours. Baseline tooth colour was measured using a chromameter. Specimens were allocated to either a commercial whitening toothpaste (A-E) or a new whitening silica toothpaste, Signal White Now (F), n=5 for each group. The teeth were brushed for 1minute with a toothpaste slurry, placed in 300ml water which was continuously agitated. At each time point the excess water was removed from the tooth surface and the colour of each tooth was measured immediately after treatment and rinse, and then after 2, 5 and 8h of further water rinsing. Changes in tooth colour were calculated in terms of Delta b* which describes the yellow to blue colour shift shown to be associated with the perception of tooth whiteness.

Results: The changes in b* from baseline are shown below.

Toothpaste	Delta b*(s.e)			
	0	2hr	5hr	8hr
A	0.23 (0.17)	0.16 (0.08)	0.17 (0.15)	0.51 (0.19)
B	0.10 (0.07)	0.06 (0.05)	0.29 (0.16)	0.26 (0.14)
C	0.15 (0.05)	0.24 (0.07)	0.14 (0.10)	0.16 (0.05)
D	0.05 (0.09)	0.28 (0.07)	0.15 (0.11)	0.32 (0.10)
E	0.01 (0.07)	0.52 (0.10)	0.45 (0.07)	0.63 (0.18)
F	-0.54 (0.15)	-0.35 (0.12)	-0.47 (0.08)	-0.46 (0.06)

Product F gave a greater reduction in yellowness and the product difference was of statistical significance (Anova, Tukey Kramer $p<0.05$) at all time points.

Conclusions: Signal White Now (Product F) was the only product to show statistically significant reduction in b* immediately after brushing and at all time points up to 8hours.

0803 (111366)

Effects of ferric sulphate on primary dentin. Optical microscopy. M.E. RODRÍGUEZ-PRIEGO, M.V. BOLAÑOS-CARMONA, S. GONZÁLEZ-LÓPEZ, and C. RODRÍGUEZ-VICO, Universidad de Granada, Spain

Objectives: To determine the demineralising capacity and the ferric ion remaining on prior treated Viscostat® (V) (Ultradent Products, Inc.South Jordan, UT, USA) primary dentin.

Materials and Methods: 22 primary molars were used. After opening and cleansing the pulp chamber, V was applied for 15, 30, 60 180 or 300 s (4 teeth per group) then washed for 15 s. Eleven molars (10 treated, 1 untreated control) were used to study the demineralisation capacity of V. Pulp chambers were filled with InTen-S Composite (Ivoclar Vivadent, Schaan, Liechtenstein). No adhesive was applied. Eleven molars (10 treated, one untreated control) were used to visualise the ferric ion. Cavities were filled with the Fuji IX system (GC America Inc., Kortrijk, Belgium) as per manufacturer's instructions. The molars were mesiodistally sectioned, fixed in a glass holder (Technovit 7210 VLC, (Heraeus Kulzer GmbH & Co.,Werheim, Germany), and abraded (WS-Flex 18-B, Struers, Denmark) until approximately 10 µm. The first 11 molars were satined with Masson trichrome dye for collagen fibers and the second group of 11 molar, with Perls' dye for ferric ion. They were examined in an optical microscope (BH-2 Olympus, Tokyo, Japan) at 100? magnification. Measurements of the stained layers thickness were performed (Tps Dig, Suny, StonyBrook, NY State University, USA, image analysis software) and compared by Oneway ANOVA.

Results: Ferric sulphate applied for 15 to 60 s demineralised the primary dentin at a similar depth. The demineralisation thickness (red colour in Masson's stain) was significantly thicker for 180 and 300 s application times. Perls' dye stained the ferric ion and formed a distinct uniform blue layer in all specimens that spread inside the opened dentin tubules, irrespectively the application time of V.

Conclusions: Ferric sulphate (V) demineralises the primary dentin. Ferric ion remains in V prior treated primary dentin.

0804 (110637)

Chronological Course of Wisdom Teeth Eruption in Croatian Population. H. BRKIC[1], M. VODANOVIC[1], I. CUKOVIC BAGIC[1], Z. LOVRIC[2], and M. PETROVECKI[3], [1]Universtiy of Zagreb, School of Dental Medicine, Croatia, [2]Private Dental Clinic, Zagreb, Croatia, [3]University of Rijeka, School of Medicine, Croatia

Dental age determination is required in various clinical and scientific disciplines.

Objectives: The aim of this research was to estimate the chronological course of wisdom teeth eruption in Croatian Caucasian population.

METHODS: The evaluated sample consisted of 1.249 orthopantomograms of Croatian Caucasian patients between 10 and 25 years and 530 males and 719 females in terms of gender. The following staging system was used for classification of wisdom teeth eruption from stage A: occlusal plane covered with alveolar bone to stage D: complete emergence in occlusal plane.

Results: The minimum age of occlusal plane covered (stage A) with alveolar bone was 10 years and mean age was 12.5 years for both genders. The corresponding standard deviation range was 1.5 years. The minimum age of alveolar emergence of wisdom teeth (stage B) was 12 years for females, and 12 to 13 years for males. The mean age of alveolar emergence ranged from 15.9 to 16.2 years for males and from 15.7 to 16.1 years for females. The corresponding standard deviation ranges were 1.8-1.9 and 1.9-2.2 years. In the stage C, the minimum age of gingival emergence in this study was 15 years for both genders. The corresponding standard deviation range was 2.0 – 2.2 years for males,

and 2.2 years for females. In the stage D, the minimum age of complete emergence of the wisdom teeth in the occlusal plane was 17 years in both genders. The mean age of complete emergence ranged from 21 to 21.5 years for males and from 21.4 to 21.5 years for females. The corresponding standard deviation range was 1.7 – 1.9 years for males, and 1.9 – 2.0 years for females.

Conclusions: The results on the emergence of wisdom teeth contribute to the forensic dentistry practice while determining the dental age at the same time.

0805 (110863)

Generalised Enamel and Dentine Defects with Hypohidrosis: A Preliminary Description. W. ELSAYED[1], R.C. SHORE[1], M. AHMED[2], S. JOSS2, C.F. INGLEHEARN[1], and A.J. MIGHELL[1], [1]University of Leeds, United Kingdom, [2]Leeds Teaching Hospitals NHS Trust

Familial enamel and dentine abnormalities may occur alone or in combination with other inherited abnormalities as part of syndromes.

Objectives: This study aims to describe a previously unreported syndrome characterised by generalised defects of enamel and dentine with hypohidrosis, which was observed in two consanguineous first cousins.

Methods: Family members were assessed through clinical examination and supporting investigations. Naturally exfoliated deciduous and permanent teeth extracted as part of orthodontic treatment were investigated by scanning electron microscopy (SEM), energy dispersive X-ray analysis (EDX) and transverse microradiography (TMR).

Results: The clinical phenotypes were consistent between the two affected individuals whose family originated from Pakistan. The dental defects involved all primary and secondary teeth with similar phenotypes. There was no hypodontia. On clinical and radiographic investigation the appearances of the teeth were consistent with hypomaturation/ hypocalcified amelogenesis imperfecta. Teeth were yellow/brown. Tooth shape prior to post-eruptive damage was grossly normal. Teeth were sensitive to thermal stimuli. TMR and EDX confirmed reduced mineral and increased organic content in enamel, respectively. Irregular, poor quality enamel prisms were observed on SEM. These were coated in amorphous material that was removed by incubation with α chymotrypsin, but not lipase. This was consistent with the inappropriate presence of protein in enamel. The dentine was characterised by abnormal morphology on SEM with fewer dentinal tubules. The only other abnormality identified was hypohidrosis. In particular, no other involvement of ectodermal tissues was identified.

Conclusions: Initial clinical, radiographic and ultrastructural analyses identified a previously unreported syndrome characterised by enamel and dentine defects with hypohidrosis in the absence of other ectodermal defects. Further investigation of this syndrome, including ongoing genetic analyses has the potential to give novel insight into pivotal events in biomineralisation and sweat gland formation.

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0806 (110286)

Prevalence of linear enamel hypoplasia in a French mediaeval population. F. MUNOZ[1], A. GRIMOUD[2], and A. SEVIN[2], [1]Université Toulouse [3], France, [2]Laboratoire d'Anthropologie CNRS FRE 2960, Toulouse, France

Prevalence of Linear Enamel Hypoplasia in a French mediaeval population.

Objectives: The aim of this study is to analyze Linear Enamel Hypoplasia (LEH) prevalence by tooth type, sex and age at death on skeletal remains of a mediaeval sample (12th-14th century A.D.) from the south of France.

Methods: LEH is a developmental defect of enamel appearing at one or more horizontal lines on the surface of the tooth crown. Seventy mandibles extracted from the medieval population of Vilarnau (southern France) were studied. The presence or absence of LEH was scored on all visible permanent teeth that had at least two thirds of the crown present (i.e. 681). Each tooth was examined under grazing light, both by the naked eye and with the help of a magnifying glass. The number of defects per tooth was recorded. Prevalences were calculated, taking a P value of less than 0.05 as statistically significant.

Results: The proportion of teeth affected by LEH was 63%, with an average of 1.25 LEH per affected tooth. The incisors were the most affected teeth (prevalence of first incisor LEH: 0.85), followed by the canines (0.79). The least affected were the molars (prevalence on the third molars: 0.30). There was no significant difference between men and women. The prevalence by age at death was 0.82 for the 15-19 year olds people, 0.67 for the 20-30 year olds, and 0.55 for the over thirty year olds (no statistically significant difference).

Conclusions: From the above figures, it can be seen that the anterior teeth were the most affected. As regards the variations by sex, the results are quite similar. Finally, the people who died youngest were the most affected by LEH because they had higher sensitivity to environmental stressors.

0807 (111487)

A Radiographic Survey of External Root Resorption in Permanent Teeth. P. SEN[1], I. KURTULUS[2], S. ASCI[1], S. HORASAN[2], S. CINTAN[1], and H. ISSEVER[1], [1]University of Istanbul, Turkey, [2]Private practice, Istanbul, Turkey

Objectives: The aim of this retrospective radiographic study was to evaluate the presence, type and distribution of external root resorption in permanent teeth.

Methods: 2140 teeth of 82 patients (45 female, 37 male), aged between 16 to 73 years were investigated. Orthopantomograms from a dental radiographic imaging center in Turkey were randomly assigned to the study. All digitized radiographs were analyzed by a software (Photoshop, Adobe, San Jose, CA). Distribution of the external root resorption in the maxilla and mandibula and in the teeth groups were compared using Pearson-chi square test. Statistical significance was set at $p<0.05$.

Results: Of 2140 teeth evaluated, 229 (11%) showed apical root resorption and 6 (0,2%) lateral root resorption. Teeth with apical root resorption showed no significance in concern of distribution in the mouth, but a statistically higher incidence occured in posterior than anterior teeth ($p<0.05$). Teeth with lateral root resorption were statistically higher among mandibulary teeth ($p<0.05$). From 229 teeth with apical root resorption, 192 (84%) had a root canal filling, which was statistically higher than teeth without fillings ($p<0.001$). 151 (65%) teeth had a nonhermetical root canal filling. From the 6 teeth with lateral root resorption, 5 (83%) had a root canal filling.

Conclusions: The present investigation shows, that there is a higher incidence of apical root resorption in posterior than anterior teeth, whereas there seemed to be a tendency towards more lateral root resorption in mandibulary teeth. Furthermore, apical root resorption was found significantly higher related to failed root canal fillings. We assume that nonhermetical root canal fillings may play a decisive role in the etiology of apical root resorption. In our opinion, hermetically filling of root canal will reduce the risk of root resorption.

0808 (109649)

creation of artificial midline maxillary diastema: opinion of Nigerian Dentists. H.O. OBORO, Univeristy of Benin Teaching Hospital, Nigeria, A.U. UMANAH, University of Benin Teaching Hospital, Nigeria, N.M. CHUKWUMAH, University of Benin Teaching Hospital, and M. SEDE, Univeristy of Benin - College of Health Sciences

AIM: The purpose of this study was to determine the attitude of Nigerian dentists towards the creation of artificial maxillary midline diastema for patients on request.

METHOD: The participating dentists of both genders were drawn from public and private dental practice in three Southern States of Edo, Delta and Enugu in Nigeria. From a total of 100 questionnaires mailed to the States, there was 93% retrieval.

RESULT: Analysis of the data showed that 43.3 % of the dentists had less than 5 years of clinical experience as against 52.7% with a clinical experience of 5 years or more. 84.9% have had patients consult them for the creation of maxillary diastemas, with only 2.2% obliging the patients request. 72% of the respondents have treated patients with various forms of complications arising from diastemas created by non-dentists. This study also revealed that only 22.6% of the dentists support the creation of midline maxillary diastema for patients after an explanation of possible complications while 77.4% do not support its creation.

Conclusions: Majority of dentist in this study do not support the creation of midline diastemas. This attitude is perhaps influenced by the views of Western cultures; that perceive "diastemas as unsightly and requiring intervention". On the contrary, in Nigeria many cultures see a maxillary midline diastema or "Open teeth" as sign of beauty; hence patients show determination and desperation in seeking its creation by non-dentists to their detriment.

0809 (110214)

Patients report on OHRQoL before and after dental hygiene treatment. K. ÖHRN, Dalarna university, Falun, Sweden, and B. JÖNSSON, Uppsala university, Sweden

The concept oral health-related quality of life (OHRQoL) is a multidimensional concept dealing with quality of life related specifically to oral health and disease. It may be a useful outcome assessment of periodontal status and treatment.

Objectives: The objective of the present study was to assess patients' experiences of OHRQoL before and after dental hygiene treatment among patients with periodontal disease.

Methods: A total of 113 patients referred to a specialist in periodontology, who underwent dental hygiene treatment participated. They completed the questionnaire General Oral Health Assessment Index (GOHAI) at the initial examination and after dental hygiene treatment.

Results: No statistically significant differences could be found between the total scores och GOHAI (before and after dental hygiene treatment). However, the items: How often did you feel nervous or self-conscious because of problems with your teeth, gums, or dentures? and How often did you feel uncomfortable eating in front of people because of problems with your teeth or dentures? were significantly improved after treatment. The most bothersome item was: How often were you worried or concerned about the problems with your teeth, gums, or dentures?

No differences in OHRQoL could be found with regard to gender. Further analyses are performed on the relationship between periodontal variables and OHRQoL.

Conclusions: Dental hygiene treatment improved some aspects of OHRQoL but the general influence was insignificant. Worries about the teeth is the most pronounced aspect of OHRQoL in patients with periodontal disease

0810 (110374)

Orthodontic Patient Self-Esteem and QoL at De-bond and Retention. A. VANDENHEUVEL[1], D. BURDEN[2], D. FIELD[1], B. GREINER[1], O. HUNT[2], C. JOHNSTON[2], M. KINIRONS[3], P. MCDERMOTT[1], D. MILLETT[1], and C. O'NEILL[2], [1]University College Cork, Ireland, [2]Queen's University of Belfast, United Kingdom, [3]Cork Dental School & Hospital, Ireland

Aims: 1) Measure orthodontic patient self-esteem and quality of life at the conclusion of orthodontic treatment and at retention 2) measure the difference between orthodontic patient self-esteem at the conclusion of treatment and at retention 3) measure the difference between orthodontic patient quality of life at the conclusion of treatment and at retention.

Methods: This was a multi-centre study co-ordinated by Queen's University Belfast and University College Cork. A longitudinal study design was used. Sample group participants (n=401) were between 11 and 21 years old. Patients were recruited from 13 orthodontic practices, one regional orthodontic clinic, one dental teaching hospital and three private practices. Convenience sampling was used to recruit consecutive orthodontic patients as they entered treatment for upper and lower fixed appliances. Participants completed the Self-Esteem Index (SEI) and Pediatric Quality of Life Inventory (PedQOL) at the conclusion of treatment and again at retention. A maximum score of 320 and 100 respectively indicates high self-esteem and quality of life on these instruments.

Results: Mean SEI score at the conclusion of treatment was 263 (SD = 30). Mean PedQOL score at the conclusion of treatment was 85 (SD = 12). Mean SEI score at retention was 267 (SD = 28). Mean