

**ABSTRACTS FOR POSTER
PRESENTATIONS**

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PP1

Detection of Efficiency of Pit and Fissure Sealant in Covering the Full-depth of Occlusal Fissures by using Optical Coherence Tomography.

Johari NI¹, Rahim NH¹, Gonzalez MAG², Sukumaran P²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objectives: To evaluate the penetrability of pit and fissure sealant (PFS) in covering the full-depth of different occlusal fissure depths using swept-source optical coherence tomography (SS-OCT).

Methods: 97 extracted premolars embedded in silicone jigs were prepared and divided using OCT into 4 classifications; score 0 (33 smooth fissures), score 1 (35 shallow fissures), score 2 (21 intermediate fissures) and score 3 (6 deep fissures). After classification, each tooth was cleaned and dried with compressed air. The occlusal fissure of each tooth was etched with 35% phosphoric acid (Scotchbond Etchant 3M ESPE) for 15 seconds, rinsed thoroughly with water for ten seconds and subsequently gently air-dried. The applicator nozzle of 3M™ Clinpro™ Sealant (3M ESPE) was placed against the fissure system, and the PFS was gently flowed into the pits and fissures, then light-cured for 20 seconds using light-curing unit (Bluephase N, Ivoclar Vivodent). Observation and measurement were performed with OCT to evaluate the PFS penetration into pit and fissure depth. The B-scan images after placement of PFS were recorded. The before and after B-scan images for each tooth sample were compared and depth of PFS penetration into fissure was measured using measuring tools available in the software.

Results: PFS completely penetrated all smooth and almost all shallow fissures. However, none of the deep fissures were completely penetrated into the base by PFS.

Conclusion: PFS penetration is affected by fissure depth of teeth relative to enamel thickness.

Keywords: Dental Caries; Dental Fissures; Pit and Fissure Sealant; Optical Coherence Tomography.

PP2:

Effect of Resin Coating on Surface Roughness and Microhardness of High Viscous Glass Ionomer Cements

Lee JS¹ , Chan WN¹ , Yahya NA² , Omar RA²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, 50603, Kuala Lumpur, Malaysia.

Objectives: To investigate the effect of resin coating on the surface roughness and microhardness of two HVGICs [Riva Self Cure HVGIC (RV) and Equia® Forte Fil (EQ)] conditioned in food-simulating liquids (FSLs).

Methods: Fifty standard disc-shaped samples were fabricated using customised stainless steel mould (10x2x2mm). The samples were assigned into five groups: air (control), distilled water, 0.02N citric acid, heptane and 50% ethanol-water solution. The samples were conditioned at 37°C for seven days. Subsequently, the surface roughness and microhardness of the samples were measured using optical profilometry and microhardness tester respectively. SEM images at x3000 were taken for qualitative observation of surface morphological changes. Data were analysed using one-way ANOVA, two-way ANOVA and post-hoc Tukey's test ($\alpha=0.05$).

Results: Effect of FSLs immersion, presence of coating and test materials on surface roughness were statistically significant ($p<0.001$). The lowest surface roughness was found on the control coated samples: RV (50.98±4.25)nm and EQ (62.77±3.92)nm; while the highest values were seen on uncoated surfaces in citric acid: RV (505.26±31.10)nm and EQ (350.33±15.36)nm. RV samples had the lowest microhardness i.e. 54.97±2.48 VHN post-immersion in citric acid.

Conclusion: With the exception of RV conditioned in heptane and ethanol, the uncoated HVGICs generally had higher surface roughness than the coated HVGICs. HVGICs conditioned in citric acid showed the most significant increase in surface roughness and reduction in microhardness.

Keywords: Food-Simulating Liquids, Surface Roughness, Microhardness, High Viscous Glass Ionomer Cements

PP3:

The Prevalence of Crossbite among Orthodontic and Paediatric Patients at Faculty of Dentistry, University of Malaya

Chua SN¹ , Lim AZY¹ , Sivarajan Saritha² , Mohd Tahir NNZ²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objectives: To investigate the prevalence of crossbite and analyse them according to gender, age, races and overlying conditions.

Methods: A retrospective study was conducted at the Orthodontic and Paediatric postgraduate clinics, Faculty of Dentistry, University Malaya from 26 June to 24 July 2019. Clinical records and study models of 385 samples were assessed based on crossbite classification guidelines.

Results: The prevalence of crossbite was 56.9% (n=219). Posterior crossbite has the highest prevalence (n=164, 42.6%) followed by anterior crossbite (n=131, 34%) and combination of both posterior and anterior crossbite (n=76, 19.7%). Crossbite was more prevalent among females (n=129, 33.5 %) than males (n=90, 23.4 %). Chinese ethnicity has most crossbite (n=111, 28.8%), followed by Malay (n=95, 24.7%), Indian (n=9, 2.3%) and minority ethnicities (n=4,1%). The prevalence of crossbite was highest among the adults (n=126, 32.7 %) followed by teenagers (n=75, 19.5%), and children (n=18, 4.7%). Crossbite was the highest (n=47, 12.2%) in premature occlusion conditions and the least (n=1, 0.3%) in cases with supernumerary tooth.

Conclusion: The overall prevalence of crossbite was 56.9%. The prevalence of crossbite was higher among the females than the males with a ratio of 1.5: 1. A higher prevalence of crossbite was observed among the Chinese and Malay ethnic groups. Crossbite was highest amongst adults as compared to teens and children.

Keywords: Prevalence, crossbite, Orthodontic and Paediatric patients

PP4:

Flexural Strength and Scanning Electron Microscope Analysis of High Strength Flowable Resin Composites

Chow ZYS¹, Ooi QER¹, Yeoh OT², Lim GS²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
2. Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia

Objectives: To determine the flexural strength and the filler pattern of highly filled flowable resin composites.

Methods: Ten rectangular bar specimens of each of nine brands of commercially available resin composites were prepared. One conventional paste resin composite was used as control while eight flowable resin composites in a cuboidal form (25mm length x 2mm width x 2mm height) were prepared according to the International Organisation for Standardisation (ISO). A three-point bending test was performed to determine the flexural strength using the Universal Testing Machine (Instron, USA). One specimen from each brand was randomly chosen and observed under a scanning electron microscope for the filler particles size and distribution pattern. One-way analysis of variance (ANOVA) and Tukey's Honestly Significant Difference (HSD) test were used to determine the statistical differences among groups ($p < 0.05$).

Results: In three-point bending test, the highest flexural strength value was observed in ParaCore which is 126.41 ± 8.57 MPa while Aura Easyflow had the lowest value among the flowable resin composites which is 78.50 ± 12.50 MPa. However, Aura Easy (control-conventional paste) had the lowest value among all, which is 61.86 ± 10.82 MPa. Resin composites with higher inorganic filler content (50-68% of filler volume) and evenly distributed filler particles showed higher flexural strength (92.04 to 126.41 MPa).

Conclusion: Higher inorganic filler content with even filler particles distribution would result in high flexural strength. High strength flowable resin composite may be used in high load-bearing area for tooth build-up.

Keywords: Flowable Resin Composite; Flexural Strength; SEM Analysis; Filler Particles Distribution.

PP5:

Effect of a Therapeutic Flavonoid on the Morphology and Growth of Hydroxyapatite Crystals

Yosri A¹, Ungku Ismail UFW¹, Syed Abdul Rahman SN², Halim AAA²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
2. Department of Oral & Craniofacial Sciences, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objectives: To investigate the effects of a bioflavonoid compound, Pinostrobin (PS) on the growth and morphology of hydroxyapatite (HAp) crystals at day 3, day 7 and day 14.

Methods: The HAp crystals were synthesised using the co-precipitation method by mixing the calcium and phosphorus solution in the absence and presence of PS. Each mixture was incubated for 3, 7 and 14 days before the final form of powder was collected. Energy-dispersive X-ray spectrometer (EDS), Fourier transform infrared spectroscopy (FTIR), and thermogravimetric analysis (TGA) analysis was conducted to examine the composition of crystals. Meanwhile, the crystallite size and morphology of the crystals were determined by X-ray diffraction analysis (XRD) and scanning electron microscopy (SEM), respectively.

Results: The PS-HAp has a lower Ca:P molar ratio with prominent sharp spherules-like crystals appearance while lacking needle-like crystals without PS. The content of inorganic compounds was reduced in PS-HAp, and presence of small humps and negligible amounts of phosphate groups in PS-HAp confirmed the presence of PS in the hydroxyapatite. Crystallites size of PS-HAp samples were also larger than HAp samples.

Conclusion: PS affects the growth and morphology of HAp crystals and regulates the mineralisation process.

Keywords: durapatite, calcium, flavonones, phosphorus, calcification, pinostrobin

PP6:

Role of Transient Receptor Potential (TRPV) Channels in Tooth Pain.

Mohd Bakri M¹, Ibrahim NS², Muhammad A²

1. Department of Oral & Craniofacial Sciences, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objectives: To determine the expression of the TRPV4 channel in the human dental pulp associated with pulpitis.

Methods: A total of 16 extracted human teeth (8 asymptomatic and 8 symptomatic) were collected from Department of Oral and Maxillofacial Surgery and Bahagian Rawatan Utama (BRU), Faculty of Dentistry, University of Malaya. The teeth were divided into two groups; in the first group, the teeth were decalcified using EDTA to allow the teeth to be sectioned and processed for immunohistochemistry (IHC) for TRPV4 detection. In the second group; the dental pulp was extirpated directly from extracted teeth and processed for IHC.

Results TRPV4 expression was successfully detected in the second group for both types of teeth, asymptomatic and symptomatic. TRPV4 staining was found to be more intense and the staining was also more evenly distributed in the dental pulp of symptomatic than asymptomatic teeth.

Conclusion: There is involvement of TRPV4 in the pain transduction of teeth associated with pulpitis. However, a larger number of teeth would be required to validate the results obtained from this study.

Keywords: Transient Receptor Potential Channels; Immunohistochemistry (IHC); Dental Pulp; Nerve Fibers; Odontoblast; Pulpitis

PP7:

Effect of Artificial Caries on Dynamic Flexural Properties of Bioactive Materials

Choo H-S¹, Choo H-Y¹, Yap AU^{2,3}, Yahya NA²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
2. Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
3. Department of Dentistry, Ng Teng Fong General Hospital, Singapore

Objectives: This study determined the effect of artificial caries on the dynamic flexural properties of bioactive restoratives and compared the dynamic flexural properties of different bioactive restoratives.

Methods: The materials evaluated included a conventional resin-based composite (Filtek Z350 [FZ]) and three bioactive restoratives - an alkasite (Cention N [CN]), a giomer (Beautiful-bulk Restorative [BB]), and an enhanced resin-modified glass ionomer [RMGIC] (Activa Bioactive Restorative [AB]). Beam-shaped specimens (12 x 2 x 2mm) were produced, randomly allocated into four groups (n=10) and conditioned in deionized water (DI), remineralizing solution (RE), demineralizing solution (DE) or pH cycled (PC) for 14 days at 37°C. After conditioning/pH cycling, the specimens were subjected to dynamic mechanical testing. Data were subjected to statistical analysis using ANOVA/Tukey's test ($\alpha=0.05$).

Results: Most of the interaction effects among material and conditioning medium were significant. While most storage modulus of the bioactive restoratives was not affected by cariogenic/acidic conditions, loss modulus and loss tangent was usually decreased with the exception of CN. Storage modulus and loss modulus of BB was significantly reduced by DE and PC, while loss modulus of AB was lowered by PC. For all conditioning mediums, FZ and AB had significantly lower storage modulus and higher loss modulus and Tan Delta than the other materials.

Conclusion: The effect of conditioning/pH cycling on dynamic flexural properties of bioactive restoratives was material and medium dependent. The dynamic flexural properties of bioactive materials were affected by cariogenic challenges with the exception of CN.

Keywords: Artificial caries, bioactive materials, dynamic mechanical testing, storage modulus, loss modulus, loss tangent

PP8:

Prevalence of Temporomandibular Disorder among Patients who seek Orthodontic Treatment and its Correlation with the Index of Orthodontic Treatment Need

Zainurin NA¹, Jaffar NFH¹, Wan Hassan WN², Fayed MS³, Yap AU⁴

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
3. Faculty of Dentistry, Cairo University
4. Faculty of Dentistry, National University of Singapore, Singapore, Singapore.

Objectives: (1) To identify the prevalence of temporomandibular disorder (TMD) signs and symptoms among patients seeking orthodontic treatment in Malaysian population, (2) to correlate it with their orthodontic treatment need as represented by their Index of Orthodontic Treatment Need (IOTN) scores and (3) to predict the demographic factors that contribute to the incidence of TMD sign and symptoms.

Methods: The cross-sectional study was conducted on 180 orthodontic seeking patients at the Faculty of Dentistry, University of Malaya. They completed the modified Fonseca Anamnestic Index questionnaire for TMD signs and symptoms. They were screened by clinicians trained and calibrated to assess IOTN. For the data analysis, Cramer's V test and multivariate analysis were performed by applying binary logistic regression model by using SPSS version 12.0.

Results: Prevalence of TMD signs and symptoms among a sample of patients seeking orthodontic treatment in Malaysian population based on this study is 11%. The association of TMD signs and symptoms with their orthodontic treatment need as represented by their IOTN was found to be not significant. Age was found to be a demographic factor that significantly contributed to the incidence of TMD signs and symptoms.

Conclusion: The prevalence of TMD is low. There was no significant association between TMD signs and symptoms with their orthodontic treatment need but age is a predictor for TMD.

Keywords: Malocclusion; Prevalence; Incidence; Temporomandibular joint disorder

PP9:

Acceptance of Nitrous Oxide Inhalation Sedation during Dental Treatment among Paediatric Patients in University of Malaya Dental Clinic

Hamsan AHI¹, Firdaus A¹, Manan NM², Hariri F³

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
2. Department of Paediatric Dentistry and Orthodontics, Faculty Of Dentistry, University of Malaya, Kuala Lumpur, Malaysia
3. Department of Oral and Maxillofacial Clinical Sciences, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia

Objectives: To assess the acceptability among paediatric patients on the provision of nitrous oxide (N₂O) inhalation sedation and potential side effects experienced in University of Malaya dental clinic.

Methods: The level of anxiety and cooperation of seven patients aged 7 to 11 years old before and after sedation were measured with the faces version of the Malay-Modified Child Dental Anxiety Scale (MCDAS_f) and Frankl Behaviour Rating Scale. Acceptance and side effects were assessed using questionnaires adapted from Shim, 2003. All the data collected were analysed descriptively.

Results: There is an increase in the mean total anxiety score from 26.86 (pre-operative) to 28.14 (post-operative) despite a high level of acceptance of the delivery system among participants. Side effects reported are minimal.

Conclusion: This study reports a favourable pattern of acceptance and low side effects among participants besides a positive improvement in the participant's behaviour post-operatively. A continuation of this study involving a larger sample size is needed in the future to significantly assess the objectives of this study, especially for the Malaysian children population.

Keywords: Dental fear and anxiety; Paediatric dentistry; nitrous oxide; relative analgesia; N₂O; inhalation sedation.

PP10:

Detection of Epstein-Barr Virus DNA in Patients with Periodontitis

Sim KJ¹, Sze ST¹, Chan MSA³, Cheah CW², Vaithilingam RD², Yap LF³

1. Faculty of Dentistry, University of Malaya, 50603, Kuala Lumpur, Malaysia.
2. Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
3. Department of Oral & Craniofacial Sciences, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objectives: To determine the presence of Epstein-Barr virus (EBV) in patients with periodontitis and control subjects using two independent established molecular techniques as well as to assess the association between the presence of EBV and clinical periodontal parameters.

Methods: Subgingival plaque samples from patients with moderate to severe chronic periodontitis (n=20) and control subjects who were periodontally healthy with reduced periodontium (n=19) were used in this study. The presence of EBV DNA in these samples was determined by quantitative polymerase chain reaction (Q-PCR) and nested PCR. The association between the presence of EBV and clinical periodontal parameters was determined using Pearson correlation analysis.

Results: EBV DNA was detected in 30.0% of patients and 52.6% of control subjects by Q-PCR, while only in 15.0% of patients and 36.8% of control subjects by nested PCR. The presence of EBV DNA was not correlated with the disease severity or clinical parameters such as periodontal pocket depth (PPD), clinical attachment level (CAL), visible plaque index (VPI), gingival bleeding index (GBI) and the number of teeth.

Conclusion: EBV DNA is detected in both periodontitis patients and control subjects and Q-PCR is a more sensitive method than nested PCR to detect EBV DNA in subgingival plaque samples. Further, the presence of EBV DNA does not correlate with clinical parameters.

Keywords: Epstein-Barr Virus; Periodontal Disease; Quantitative PCR; Nested PCR.

PP11:

Push-out Bond Strength of Hydroxyapatite Coated Gutta Percha without Sealer

Loo QW¹, Tan QS¹, Azami NH²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objective: To evaluate the push-out bond strength of Hydroxyapatite coated Gutta-Percha (HAGP) towards root dentine without sealer.

Methods: Biomimetic technique is used, using 1.5 Tas-stimulated body fluid (SBF) to coat the treated GP. 21 straight mandibular molar mesial roots were selected and instrumented using ProTaper Next rotary files. The specimens were divided into 3 main groups (n=7 per group) that were subjected to different irrigation protocols. Group 1; Conventional GP with sodium hypochlorite (5.25 %), Group 2; HAGP with sodium hypochlorite and Group 3; HAGP with Sodium hypochlorite followed by EDTA. For each group, the roots were obturated without sealer. The obturated roots were stored in SBF for 30 days at 37°C. The roots were mounted in epoxy resin and sectioned into 1mm thickness slices to obtain 3 slices per root using Micracut 125 slow speed precision cutter (n=21 per group). The bond strength between the HAGP and root dentine was determined by using the push-out test using the Universal Testing Machine with 0.5mm/min push out speed. (Shimadzu, Japan). The push-out value for each group was calculated and analysed with One-way ANOVA.

Results: There is no significant difference in bond strength between HAGP and root ($p>0.05$) compared to the bond strength between conventional GP towards root dentine.

Conclusion: There is no bonding reaction between the HAGP to the root dentine.

Keywords: Hydroxyapatite, Gutta Percha, Bonding, Biomimetic coating, root dentine, push-out

PP12:

Epidemiological Study of Odontogenic Cysts and Tumours in Faculty of Dentistry, University of Malaya

Koong WY¹, Loh MQ¹, Goh YC², Zaini ZM²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Department of Oral and Maxillofacial Clinical Sciences, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objectives: Odontogenic cysts and tumours are unique to the oral and maxillofacial region. This record-based retrospective study was carried out to determine the prevalence, demographic and clinical characteristics of these lesions diagnosed in the Faculty of Dentistry, University of Malaya over 20 years.

Methods: We retrieved 12401 histopathological records from Oral Pathology Diagnostic and Research Laboratory (OPDRL) from 1998 to 2018 and performed descriptive analyses on the information of interest obtained. The odontogenic lesions were coded according to the latest WHO classification.

Results: A total of 1626 odontogenic lesions were recorded. The peak incidence of diagnoses of these lesions was in the second and third decades of life. Odontogenic cysts were more prevalent in males whereas odontogenic tumours were more prevalent in females. Radicular cyst was the commonest cyst with a slight male preponderance and Chinese predominance. Ameloblastoma was the commonest tumour demonstrating minor male and Malay predilection. Swelling was the commonest clinical presentation. Unilocular radiolucency was the commonest radiographic presentation.

Conclusion: This is the first epidemiologic study of odontogenic cysts and tumours on the OPDRL database. Our findings are in line with most epidemiological study worldwide. We hope the data is beneficial for chairside clinical assessment of patients suspected with odontogenic cysts or neoplastic jaw lesions, and treatment planning purposes.

Keywords: Epidemiology; Oral Pathology; Odontogenic Cysts; Odontogenic Tumors; Malaysia

PP13:

Provision of Dental Treatment for Patients with Special Health Care Needs at Faculty of Dentistry, University of Malaya, Kuala Lumpur.

Lim JG¹, Phua JH¹, Mohamed Rohani M², Manan NM²

1. Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.
2. Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

Objectives: To assess different categories of special health care needs (SHCN) patients, their socio-demographic background and types of dental treatment received by patients at Special Care Dentistry (SCD) clinic, University of Malaya.

Methods: All dental records of patients receiving treatment in SCD clinic from the year 2014 until 2019 were reviewed. All data were analysed using Microsoft Excel version 2013.

Results: There were more male patients (N= 106, 53.5%) than female patients (N= 92, 46.5%) in SCD clinic. The largest age group was middle-age adults (N= 120, 60.6%) (25 years old until 59 years old), followed by young adults (N= 42, 21.2%) (15 years old until 24 years old) and elderly (N= 36, 18.2%) (60 years old and above). The most common type of SHCN patients was in “medical conditions” category (N= 122), followed by “developmental problems” (N= 86), “psychiatric problems” (N= 24), “sensory disabilities” (N= 16), “specific learning disabilities” (N= 14) and “physical disabilities” (N= 6). Dental treatment was counted based on the total number of procedures had done. The most common dental treatment provided for SHCN patients was preventive care (N= 321), followed by dental extraction (N= 209), periodontal (N= 201) and restorative treatment (N= 155). Less common dental treatments included provisional treatment, prosthodontic, endodontic, general anaesthesia procedures and emergency treatment.

Conclusion: SHCN patients in SCD clinic were mainly middle-age adults, and resided in Selangor. The most common SHCN patients were in the “medical conditions” category, and preventive care was the most common dental treatment provided.

Keywords: Dentistry, disability, dental care, oral health, dental general practice, preventive dentistry.