Abstracts
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CF-O-1

The applicability of Rao's Mandibular Index in assessing sex for Malaysian population

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Sex prediction is important for human identification. The prediction using dental arch in Mongoloid populations are not available. Thus this study aimed to generate a sex prediction model using Rao's formula and to assess its applicability for Mongoloid population in School of Dental Sciences of Universiti Sains Malaysia (PPSG). 108 subjects (54 males and 54 females) of Mongoloid population from PPSG were randomly selected. Impressions of upper and lower jaws were taken and dental casts were made. Mandibular right canine width, mandibular intercanine width and anterior teeth crowding were measured using a Vernier caliper. Standard Mandibular Canine Index (MCI) for Mongoloid population was calculated based on Rao's formula. MCI for each subject was calculated as a ratio between the width of right mandibular canine and intercanine width. The obtained values were compared to the calculated Standard MCI for Mongoloid population and Indian population. The data were also analyzed using discriminant analysis including anterior segment crowding (Little's Irregularity Index) and MCI as predictors. 61.1% were correctly classified using Mongoloid's Standard MCI. If using Indian population's Standard MCI, the correct classification rate was 62%. The result from discriminant function analysis was 61%. The prediction success rates using Rao's formula were lower than the success rates using tooth dimensions. In conclusion, Rao's formula is not suitable for sex prediction in Mongoloid population.

CF-O-2

The validation of radiographic images by Romexis software

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Radiographic estimation of working length is crucial for good treatment outcome in endodontics and implant. The purpose of this experimental study is to assess the possibility of clinical significant distortion caused by a radiographic images processing software, known as Romexis (Planmeca Oy, Helsinki) and its performance in radiographic estimation of working length compared to conventional radiograph. The study was conducted using 5 sound lower incisors. Actual working length of the teeth were first measured and recorded. Conventional and digital radiographs of the teeth were then taken. The radiographic images of the teeth were measured with digital calliper for conventional radiograph; while Romexis software was used for digital radiograph of the teeth. Every measurement was then repeated twice and the mean was obtained. The discrepancies between the radiographic estimated length and actual length of teeth were calculated. Data was analysed using descriptive statistic and Wilcoxon Signed Rank test. The result shows that Romexis software tends to underestimate the working length compared to actual length and conventional radiograph. This underestimation of working length is clinically not significant (less than 0.5 mm) despite statistically significant; as the working length is generally measured to the nearest 0.5 mm in dentistry. In conclusion, distortion of radiographic images processed by Romexis software is clinically not significant, despite being statistically significant. Therefore, Romexis software can be used as an alternative for radiographic estimation of working length in clinical setting.

CF-O-3

Comparison of image clarity between digital and conventional radiography

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The manipulation of radiographic images is possible in digital radiograph; thus the exposure and processing time is shorter when compared to conventional radiography. The aim of the study was to compare the image clarity between conventional and digital intraoral radiographs. Digital and conventional radiographs were taken of an extracted maxillary incisor with constant setting of the x-ray source at 70kVp and 5mAs. Then, three series of the digital radiographs of the same specimens were captured at 66 kVp, 63kVp and 60 kVp. Images were presented to 46 fourth year dental students to evaluate the image quality considering the clarity of tooth pattern. The percentage of observers who determined either of the images was superior was recorded. Digital setting at 66kVp images were rated as the most superior among all the 4 settings by 67.4% of observers followed by 65.2% for voltage setting 70kVp, 63.0% for voltage setting 63kVp and 56.5% for voltage setting 60kVp. Although the percentage of choosing the most superior image started to decrease in digital setting in 70kVp after 66kVp, however, it was still better than the conventional method. In conclusion, digital radiographic images taken on extracted tooth specimens with the setting of 66kVp was the most superior when compared to the other settings. Conventional radiography was inferior to digital image at any setting. This study suggested that the image of digital radiography was superior to conventional radiography.

CF-O-4

Validation of the Computer-Assisted Simulation System for Orthognathic Surgery (CASSOS) distortion factor

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Digital cephalometric radiography has several advantages over manual cephalometry which causes its widespread application in orthodontic practices nowadays. Few studies have been carried out on different cephalometric softwares to compare measurements between manual and digital cephalometry. The aim of the present study was to quantify magnitude and direction of distortion associated with scanning lateral cephalograms with two different resolutions besides to assess the accuracy and reproducibility of Computer-Assisted Simulation System for

Orthognathic Surgery (CASSOS). Additionally, the amount of magnification of soft copy images imported into CASSOS was one of our interests. 15 cephalograms were selected randomly from the Record Unit, Universiti Sains Malaysia. All films had 10 fiducial points marked and were scanned at 75 dots per inch (dpi) and 300 dpi. Manual and digital measurements were compared to obtain magnification factor. Subsequently, 37 cephalograms were traced manually and digitally with CASSOS to assess its accuracy and reproducibility after applying the obtained magnification factor. Steiner analysis was utilized. The magnification factor of 300dpi and 75dpi for both horizontal and vertical measurements were 0.50 and 0.95 respectively, while for softcopy image measurement was 0.89. Cephalometric comparisons between original and digital images showed statistically differences in SND, maxillary incisor to NA, interincisal angle, mandibular plan (GoGn) to SN, and mandibular incisor to GoGn. Although some distortion was noted, it was clinically acceptable after correction with magnification factor. The reproducibility of CASSOS is excellent and as good as other commercial cephalometric softwares.

CF-O-5
Dental arch dimensions in Malay group

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The objective of this study was to quantify the dental arch dimensions in a sample of Malaysian Malays and to assess the differences due to sex and age. A cross sectional study was conducted at School of Dental Sciences, Universiti Sains Malaysia. Eighty upper and lower dental casts were randomly selected and divided into two age groups of (13–14 and 18-36 years) for males and females. Stereophotogrammetry system was used to capture the dental casts and the measurements were analysed by using Australis software. In most of the variables measured, the results showed that the dental arch dimensions revealed significant differences between males and females (p<0.05). The measurement of the dental arches between two age groups in females showed no significant difference except for the upper arch length and perimeter. In conclusion, the morphologic characteristics of the dental arch dimensions of the Malay ethnic are differed between genders, with larger dimension in males. Also, there is no significant difference in between the two age groups.

CF-O-6
Mesio-distal crowns dimension in Malay with Class I occlusion

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Mesio-distal crown dimension revealed clinical importance in orthodontics, prosthodontics as well as the other fields of dentistry. The aim of this study was to quantify mesio-distal crowns dimension of Malay population with Class I occlusion in terms of symmetry, age and sexual dimorphism. The dental casts of 80 Malay subjects (40 males and 40 females) were selected from the archives of School of Dental Sciences (Universiti Sains Malaysia). The sample was divided into two age groups (13 to 14 and 18 to 36 years old). Dental cast images were taken using stereophotogrammetry system and the measurements of mesio-distal crowns dimension were analysed using Australis software. The results showed that there were insignificant differences (p>0.05) between right and left

variables in most teeth. Significant sexual dimorphisms were found in, upper and lower first molar, upper and lower second premolar, upper and lower central incisor and lower canine. First molars displayed the largest sexual dimorphism. Upper lateral incisor, upper central incisor, lower first molar and lower second premolar in females of the older age were significantly larger than the younger age group. In conclusion, mesio-distal crowns widths of males were significantly larger and adults have larger teeth than the adolescents with more significant differences seen in females compared to males.

CF-O-7
Nasolabial and mentolabial angle norm determination using photogrammetric analysis in Malaysian adults

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While measurement of nasolabial and mentolabial angles is important clinical examination in pre-orthonagthic surgery assessment, data on non-western population is limited. This study was therefore conducted to determine the range of nasolabial and mentolabial angles in normal Malaysian adults with comparison between males and females. A total of 50 Class I males and 52 Class I females aged 19-30 years from three main ethnic groups were randomly selected from dental and medical students and staff in dental clinic of Hospital Universiti Sains Malaysia (HUSM). The photographic set-up consisted of a 50mm Nikon DAT camera held in position by a tripod. The photos taken in JPEG format were digitalised and analysed using ProVixwin software. Independent *t*-test was used in statistical analysis to compare any possible gender differences in the means of nasolabial and mentolabial angles. The mean of nasolabial and mentolabial angles for males was 92.99˚ and 130.44˚ whereas, for females, it was 95.04˚ and 130.73˚ respectively. Gender differences were found to be insignificant for both nasolabial and mentolabial angles. In conclusion, despite having great variation in our population, the nasolabial and mentolabial angles are gender independent.

CF-O-8
Measuring gingival arc, zenith position and levels among dental and medical students in Universiti Sains Malaysia (USM) by digital microscope

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The appearance of gingival tissues surrounding the teeth plays a significant role in the aesthetics of anterior maxillary region of the mouth. The gingival zenith is defined as the most apical point of the marginal gingival scallop. The objective of this study was to quantify the mesio-distal, apico-coronal displacement of the gingival zenith in the maxillary anterior teeth and to quantify the arc of gingival margin in the maxillary anterior dentition. A total of 108 study models (54 males and 54 females) with an average age of 23 years old with the presence of healthy gingiva and absence of crowding, diastema and anterior restoration were evaluated. Based on the study models, the gingival zenith positions (GZP) were measured in the mesio-distal and apico-coronal directions from the tangent line were measured with digital microscope, Hirox KH-7700 version 2.0 (Hirox, Japan) for

each central incisor, lateral incisor and canine. The data were analyzed using SPSS v.14.0.1. This present study demonstrated that 100% of subjects have distally displaced central incisors (CI) with approximately 0.91 to 1.00 mm for left and right central incisors respectively. The mean displacement for the right lateral incisor=0.34mm, left lateral incisor= 0.38mm, right canine=0.19 mm and left canine=0.15 mm. The GZP in the mesio-distal and apico-coronal directions were symmetrical for each tooth type. In conclusion, the distal displacement of GZP for right and left sides showed similar trends *i.e.* central incisor>lateral incisor>canine. These data could be used as a reference point for aesthetic procedures involving the maxillary anterior dentition.

CF-O-9
Survival of ameloblasts, fibroblasts and osteoblasts from rat mandibular incisor teeth by tooth-slice culture for 24 hours: *in vitro study*

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Rodent mandibular incisors grow continuously throughout life and this makes a convenient model for studying development of tooth and its structures. *In vitro* tissue culture models are used extensively in studies of tooth and its structures because the molecular and cellular processes involved in normal and disease situation can be assessed. The objective of this study is to observe the survival potential of ameloblast, fibroblasts in periodontal ligament and osteoblasts cells in alveolar bone during tooth formation in tooth-slice culture medium up to 24 hours (h). One of the rat mandibles was cut in transverse sections of approximately 2 mm thickness into tooth-slice structure and was washed and fixed in 10% neutral-buffered formalin for 24h, demineralised in 10% EDTA for 5 days as a control. The other tooth-sliced was placed in sterile culture medium containing DMEM, vitamin C, fetal calf serum, L-glutamine, penicillin/streptomycin solution and was cultured at 37°C in an atmosphere of 5% CO_2 in air, in a humidified incubator. After culture, the tooth-slice was fixed and demineralised as the control sample. Both were processed and embedded in paraffin wax for sectioning at 5μm and stained with haematoxylin and eosin (H&E) and observed under light microscopy. Results showed evidence of normal ameloblasts, fibroblasts and osteoblasts cells morphology in cultures of 24 hours closely paralleled to that of the uncultured tissue (control). This concludes that ameloblasts, fibroblasts in periodontal ligament and osteoblasts in alveolar bone of rat mandibular incisor were able to survive in culture medium for to 24 hours.

CF-O-10
The effectiveness of oral appliance in obstructive sleep apnea patients

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Oral appliance has been used as an alternative treatment to continuous positive airway pressure (CPAP) for mild to moderate obstructive sleep apnea (OSAS) and snoring. The appliance modifies the upper airway by changing the posture of the mandible and tongue. The aim of this study is to study effectiveness of snore guard in terms of apnea-hypoapnea index (AHI) and snoring episode per hour in patient who suffered from OSA and snoring in HUSM. A total of 5 patients (4 males and 1 female) who having mild to moderate OSA (AHI less than 30) whose aged between 23-65 years old were involved in this study. Impression was taken for oral appliance construction. Each patient was given appointment to attend sleep laboratory after the anti-snoring device had been fit in. Median of AHI, snoring episode per hour before and after wearing anti-snoring device were calculated by SPSS 16.0. The snoring episode per hour decreased from 39 to 1 ($p < 0.05$) and there was statistically significant different between before and after wearing snore guard. However, the AHI increased from 15.1 to 23.8 ($p >0.05$) so there was no statistically significant improvement between before and after wearing snore guard. Comparative studies about effectiveness of oral appliance have helped define the role of oral appliance therapy in patients with obstructive sleep apnea and snoring problem. An important limitation of oral appliance therapy includes less effective in reducing the AHI. Therefore, oral appliance could suggest that it is not indicated as first-line therapy for patients with severe OSA.

BS-O-1
Effects of bleaching used on hardness and surface morphology of experimental nanocomposites

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Bleaching is getting more popular in this world that concerns aesthetic. However, there are worries regarding the effect of bleaching on the physical properties of restorative materials. The purpose of this study is to evaluate the effects of 10% and 20% Opalescence home bleaching agent on the surface morphology and hardness of experimental nanocomposites known as KeLFiL, compared with Filtek Z350 (3M ESPE, USA) and TPH3 (DENSPLY, Caulk). Total of 54 samples were prepared using acrylic moulds (4mm diameter x 2mm thick) with 18 samples from each material (n=6 controls and places in distilled water for 14 days; n=6 were bleached with Opalescence 10% carbamide peroxide; n=6 were bleached with Opalescence 20% carbamide peroxide). All samples were stored in distilled water bath of 37ºC for 24 hours before bleaching. Bleaching procedures were carried out for 8 hours for 10% concentration and 2 hours for 20% concentration carbamide peroxide everyday for 14 days. Atomic Force Microscopy (AMBIOS Technology, USA) was used to test the surface morphology of composites after 14 days of bleaching while Vickers Hardness Tester FV-7 (Future Tech Corp, Japan) was used to test the surface hardness. All tested materials showed no significant changes in the surface roughness. However, there are significant changes in surface hardness when compared between control group with 20% concentration carbamide peroxide and between 10% with 20% concentration carbamide peroxide. In conclusion, after 14 days of bleaching, there is no significant effect on the surface morphology although the surface hardness for KeLFiL is significantly reduced.

BS-O-2
Effects of resin cements on hardness and thickness around titanium post: an intraradicular assessment

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Polymerization of resin cement need to be evaluated as uncured resin considered harmful to periodontal tissues.

Cement thickness affects bonding efficacy of endodontic post. Hardness is an indirect property to evaluate polymerization of resin materials. The purpose of this study was to evaluate hardness and thickness of two types of resin cement at coronal (1mm), middle (4.5mm) and apical (8mm) level of root canal. Root canals of 10 extracted maxillary anterior teeth were prepared for post cementation. Panavia F [dual-cured (group A)] and Rely X Luting 2 [self-cured (group B)] were used to cement titanium post. After 24 hours water storage, samples were longitudinally sectioned; hardness and thickness measured using Vicker's Hardness Tester and Image Analyzer along the cement line at the 3 different root level. Statistical analysis was performed to test significance of differences in hardness and thickness of the two types of cement (t-test; p=0.05) and at different levels of the same type (one-way ANOVA followed by multiple comparison; p=0.05). Significant difference of hardness was found at the apical level between the two groups and between the coronal and apical level of group A (p<0.05); no significant differences in hardness and thickness were observed in group B (p>0.05). Voids were detected in cement layer of both groups. Curing efficacy of dual-cured resin cement was found to be less than self-cured type at apical level. It indicates absence of light responsible for inadequate polymerization. Both cement types have tendency to become thinner at increasing root depth.

BS-O-3
Microleakage evaluation of nanohybrid endodontic sealer

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The major objectives of root canal therapy are removal of diseased pulp tissue followed by cleaning and shaping of the root canal, disinfection of contaminated canals and obturation to prevent reinfection. Root canal filling is a combination of two materials mainly, gutta percha and sealing cement. The purpose of this study is to evaluate the degree of microleakage findings of two endodontic sealers, Nanoseal Plus and commercial AH Plus. A total of 50 extracted single rooted anterior teeth with straight canal have been used as samples and were prepared using crown down technique using nickel titanium protaper. The 50 extracted single rooted teeth samples were then divided into 4 groups; group1 (20 teeth), group 2 (20 teeth), positive control (5 teeth) and negative control (5 teeth). Group 1 and group 2 were filled with F2 gutta percha and AH Plus and Nanoseal Plus respectively, while positive control group was instrumented but not filled with gutta percha and sealer and negative control was instrumented and filled with gutta percha and AH Plus. All the samples were immersed in the methylene blue 0.2 % for one week and measurement of leakage to the most coronal extent of dye penetration using LEICA imaging system was done. Data analysis showed that Nanoseal plus group demonstrated more microleakage compared to AH Plus but there was statistically no significant difference of degree of microleakage between Nanoseal Plus and AH plus as the P 0.188 (p>0.05).

BS-O-4
Synthesis of hydroxyapatite-silica nanocomposite and effect of its addition to the hardness of glass ionomer cement

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Despite the unique fluoride release properties and forming ionic bonds with tooth structure exhibited by Glass Ionomer Cement (GIC), the most intractable problem is probably the brittleness of material. Efforts to improve their mechanical properties have been made in several aspects. Simultaneous addition of prechemically or *in situ* mixing of hydroxyapatite (HA)-silica nanocomposite into GIC is a new approach. This study aimed to synthesize HA-silica nanocomposite by *in situ* sol-gel technique and to evaluate its addition to the hardness of GIC. Nanohydroxyapatite was produced by using calcium hydroxide ($Ca(OH)_2$) and phosphoric acid (H_3PO_4) as calcium and phosphorus sources. A quantity of 5, 10 or 20ml tetraethyl orthosilicate (TEOS) was added into $Ca(OH)_2$-H_3PO_4 sol to produce HA-silica-nanocomposite with 11, 21 and 35% silica, respectively. The synthesized HA-silica-nanocomposite was incorporated into GIC (Fuji IX). Vickers hardness of the resulted HA-silica-GIC was then measured at 24 hours after the initial mixing. Transmission electron microscopy (TEM) characterization revealed that the morphology of the synthesized HA-silica nanocomposite was a mixture of spherical silica particles embedded within elongated HA. The resulted hardness showed that the hardness of HA-35 SiO_2-GIC was higher than that of HA-21SiO_2-GIC and HA-11SiO_2-GIC, with the highest hardness achieved by 5%HA-35SiO_2-GIC (70.8HV±11.20) with ~75% increment as compared to pure GIC. In conclusion, nanosilica particles may fill the void between the elongated HA particles, subsequently enhancing the packing density and further improving the hardness of the GIC. Application of HA-silica-GIC with improved hardness might lead to extended clinical indications, especially in stress bearing areas.

BS-O-5
Effect of various staining on experimental dental nanocomposite

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Resin composites have been widely used in restorative dentistry due to patient demands for better aesthetics. Maintenance of color of restoration is important for the durability of treatment. This study aims to determine the color stability of KeLFiL compared to Filtek Z350 and TPH3 in coffee, tea and curry. Twenty-eight discs (5mm x 2mm) were prepared for each of the three nanocomposites (KeLFiL, Filtek Z350 and TPH3), to give a total of 84 specimens. Specimens in each group were divided into 4 subgroups (n=7) and immersed in three staining solutions (coffee, tea, and curry) and distilled water (control) at 37°C for 168 hours and assessed at the period of 0 hour (baseline reading), 48 hours, 96 hours and 168 hours. The colour difference (ΔE*) values were assessed with a spectrophotometer (Cecil CE 2021 UV/VIS). The data were analysed using Kruskal-Wallis and Mann-Whitney tests. Results showed that all materials were susceptible to staining by all staining solutions. KeLFil exhibited the most colour difference in coffee compared to tea and curry. Filtek Z350 exhibited the most colour difference in tea and curry. TPH3 exhibited the least colour difference in all staining solutions. The colour difference of these three nanocomposites were not statistically significant (p<0.05) for the periods of 48 hours in coffee and 168 hours in curry solution. In conclusion, KeLFiL was more colour stable than Filtek Z350 in tea and curry but less colour stable than TPH3 in all staining solutions. All nanocomposites remained clinically acceptable (ΔE*<3.3) after continuous exposure to staining solutions.

BS-O-6
Effect of casting systems on castability and surface properties of cobalt chromium alloys

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Casting results of Co-Cr alloys varies with casting systems and investments. Effects of casting systems on castability, loss of mass and hardness of Co-Cr cast specimens after polishing were evaluated. Two types of casting systems with different casting principles (Fornax G/GU and Nautilus CC plus) and two types of investments [Ecovest PM (EPM) and Chromecast -SG (CSG)] were used. Castability was evaluated using mesh wax patterns (25x25mm) and was determined from the number of completed holes filled by the alloys. Mass loss (in %) was evaluated using acrylic plates (10x20x1.5mm). Cast plates were weighed before and after polishing with 320-1000 grit sandpaper. Polished cast surface was assessed with AFM until 'limit' value (100±20nm) was achieved. Hardness of polished surface was measured with Vickers hardness tester. Porosity of investment was examined using a microscope. Five specimens were used for each of the experiment. Results were analysed with Mann Whitney test ($α= 0.05$). Significantly improved ($p<0.05$) castability was observed using centrifugal systems with both investments. CSG showed significantly ($p<0.05$) greater castability than EPM using vacuum system. Mass loss was not significantly different ($p>0.05$) among the casting systems. Hardness value for vacuum system with EPM was significantly harder ($p<0.05$). More porous structure was observed in CSG. Within the limitations of the study, higher casting force and increase porosity of investments showed better castability. The mass loss was the same with both casting systems which indicates polishing procedures is not influenced by casting systems. Differences in hardness using different casting systems suggest further elemental analysis.

BS-O-7
Assessment of DNA damage caused by locally produced nanocomposite using Comet assay

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The aim of this study was to assess the DNA damage caused by the locally produced nanocomposite (School of Dental Sciences, Universiti Sains Malaysia) using Comet assay. Before new materials are approved for medical use, mutagenesis systems to exclude cytotoxic, mutagenic, carcinogenic and genotoxic properties are applied worldwide. In the present study using Comet assay, Stem cells from Human Exfoliated Deciduous Teeth (SHED) were cultured and treated with the light cured nanocomposite at five different concentrations (0.006, 0.0125, 0.025, 0.05 and 0.1 mg/ml) along with concurrent negative (medium) and positive controls (zinc sulphate). Fifty cells were captured randomly from each slide for the scoring of comets. Damaged cells due to the presence of tails, appear as comets, whereas, undamaged cells have no tails because of the intact nucleus. Since the comet tail moment is proportional to the amount of DNA breakage in a cell, the mean value of tail moment was used as a measurement of DNA damage. The locally produced nanocomposite at five different concentrations used in the current study did not induce any DNA damage as measured by the Comet assay. There was no significant difference in the tail moment between the negative control and the different concentrations of the locally produced nanocomposite tested ($p>0.05$). However, zinc sulphate, which was used as a positive control induced DNA damage. The results indicated that the locally produced nanocomposite was non-genotoxic under the present test conditions.

BS-O-8
Streblus asper suppresses p42 MAPK signalling in the induction of apoptosis on osteosarcoma cells

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Streblus asper root extract was shown to inhibit the growth of osteosarcoma cell line (CRL 1543) by exerting apoptotic features. Hence, to verify the claim of this agent being chemopreventive, this study was done with the aim to investigate the exact molecular pathway taken. As a preliminary investigation, MAPK (mitogen-activated protein kinase) pathway was chosen to test by employing Western Blot analysis to separate the protein bands and then the expression of total and cleaved ERK (extracellular signal-regulated kinase) ½ bands were measured to compare for significant changes. Using β-actin proteins as an internal control, the expression of the total and phosphorylated ERK ½ protein bands, especially at the molecular weight of 42, were shown to be suppressed with a significant statistical result ($p<0.05$) after being treated with *Streblus asper* root extract. This verifies our hypothesis and proves that *Streblus asper* is indeed a reliable agent in combating cancer cells.

BS-O-9
Synthetic hydrazone derivative acts as an apoptotic inducer in chemopreventive activity on tongue cancer cell line

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One of the great achievements in chemopreventive study against carcinogenesis is to identify an ideal apoptotic inducer especially one which could induce early apoptotic activity. Therefore, in this study, we tried to investigate the chemopreventive effect of a hydrazone derivative by using tongue cancer cell line as an in vitro model and to elucidate its effectiveness on the induction of apoptosis. Alteration in cell morphology was ascertained while the live-death analyses of the cells were confirmed under confocal microscope. In addition, cytotoxicity test was performed using normal mouse skin fibroblast cells. The results showed that the compound inhibited the growth of tongue cancer cells with an inhibitory concentration (IC_{50}) of 0.01 mg/ml in dose and time-dependent manner. Consequently, the compound induced a 2-fold increase in early apoptotic activity and a G0G1 phase cell cycle arrest compared to untreated cells. Exposure of the cells to the compound also resulted in alterations of cell morphology including cellular shrinkage and vacuolization. On live-death analysis under confocal microscope using Calcein and Ethidium stain, it was confirmed that the compound exerted cell death. Further study demonstrated that the compound had no cytotoxic effect on normal mouse skin fibroblast cells. In conclusion, the findings in this study suggested that the hydrazone derivative acts as an apoptotic inducer in chemopreventive activity, which could be attributed, in part, to its anti-proliferative effect on tongue cancer cells.

BS-O-10
The antibacterial activities of *Punica granatum L.* against oral bacteria: *in vitro* study

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Punica granatum L. (pomegranate) has known to have a wide spectrum of antibacterial, antiviral, and antihelminthic properties. It was reported to be effective in dental diseases; however, there are scarce data on the antibacterial activity of *Punica granatum* against common oral bacteria. This *in vitro* study was carried out to determine the antibacterial effects of *Punica granatum* extracts against oral bacteria - *Streptococcus sanguis, Streptococcus oralis, Streptococcus mutans, Staphylococcus aureus,* and *Pseudomonas aeruginosa.* Ethanolic and water extract of the pulp and seeds and the inner yellow separator of pomegranate were used against the oral bacteria using agar well diffusion technique. Results showed that pomegranate exhibited enhanced antibacterial effect with ethanolic extract compared to water extract. Pomegranate extract using ethanol showed both bacteriostatic and bactericidal effects against all oral bacteria. In conclusion, *Punica granatum L.* showed antibacterial activities against common oral bacteria. Thus, it has some potential in the management of certain oral diseases.

BS-O-11
In vitro antibacterial activity of MTA mixed with calcium chloride and honey

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Mineral Trioxide Aggregate (MTA) has been used in repairing root perforations, as a root-end filling material and pulp capping material. However, MTA usage has some disadvantages, such as prolonged setting time and poor handling properties and limited antibacterial activity. Honey as an additive to MTA had improved handling properties, apart from its reduced setting time which was achieved with addition of calcium chloride. Till date, no study on antibacterial activity of MTA mixed with sterile water, honey and calcium chloride has been done. The objective of the study is to determine the antibacterial properties of MTA mixed with sterile water, calcium chloride and two types of honey. Using agar diffusion test, antibacterial activity of MTA mixed with sterile water, calcium chloride and honey was determined. Manuka honey and Tualang honey were used, employing single layer plate method. Freshly mixed materials were placed in three wells, punched at equidistant on pre-inoculated Muller-Hinton Agar plate. Positive controls were employed using antimicrobial disc Kanamycin 30 mcg/disc and negative controls using sterile empty paper disc, dipped in sterilized Cation Adjusted Mueller Hinton Broth. Tests were performed in triplicates. Plates were kept at room temperature 1 hour prediffusion and were then incubated at appropriate condition. The zone of inhibition was measured at 24, 48 and 72 hours interval. In this study, MTA mixed with sterile water, calcium chloride and honey showed antibacterial activity against *Streptococcus mutans* and *Actinomyces viscosus*.

BS-O-12
In vitro cytotoxicity evaluation of MTA mixed with distilled water, calcium chloride and two types of honey

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Mineral trioxide aggregate (MTA) is being used widely in dentistry as root end filling material, direct pulp capping materials etc. Although MTA is an ideal endodontic material, it has some disadvantages, such as longer setting time and less ideal working properties. Various additives like calcium chloride have been suggested to accelerate the setting of MTA and bee product like honey to improve the handling properties. The objective of this study was to evaluate the cytotoxic effects of MTA mixed with distilled water, calcium chloride and Tualang honey or Manuka Honey. This was accomplished by using cell viability assays (MTT assays) for mitochondrial dehydrogenase activity in L929 mouse fibroblasts after 72 hr exposure to extracts of varying concentration of tested materials , in 72 hr set states. Differences in mean cell viability values between materials in each concentration were assessed using the One-way ANOVA and Bonferoni post-test. The results showed that there were statistically significant differences in cytotoxicity among the test material and the control group in each concentration except in the most diluted concentration. There was no significant difference between MTA and MTA mixed calcium chloride in all concentration. This study shows that the various additives have effect on the cytotoxicity of MTA in higher concentration. The test materials were concentration dependent and the cell viability of MTA mixed calcium chloride, are higher compared to other test material.

CL-O-1
Radiographic evaluation of congenitally missing third molars in Malay children

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The third molar is the most common congenitally missing tooth and its prevalence varies widely between populations. Knowledge of the presence of third molar is important for treatment planning in orthodontics, paedodontics and forensic dentistry. The aim of this descriptive study was to determine the prevalence of congenitally missing third molars in Malay children. All orthopantomograms (OPGs) of Malay children aged 12 to 16 years, taken between years 2004 to 2010, were examined. Unambiguous OPG's of Malay children with no medical problems were included, while radiographs whose date of birth could not be obtained were excluded. A total of 834 OPGs were selected of which 620 (74.3%) children had all 4 third molars. Varying degrees of congenitally missing third molars were noted in the other 214 (25.7%) children. From these, 39 (4.7%) showed total absence of all third molars, while [81 (9.7%)], [72 (8.6%)] and [22 (2.6%)] had one, two, and three missing third molars respectively. The right maxillary third molar showed the highest prevalence of agenesis with [143 (17.1%)] missing, followed by left maxillary [136 (16.3%)], right mandibular [88 (10.6%)] and lastly left mandibular [80 (9.6%)]. There were significant differences in agenesis of third molars between the right and left sides with right more than left, and between upper and lower arches with upper more than lower. No significant differences were found between Malay boys and girls. In conclusion, the present study showed 25.7% of Malay children had varying degrees of congenitally missing third molars, with no sexual predilection.

CL-O-2
Radiograph diagnosis of approximal caries and restorative treatment in patients attending dental clinic HUSM

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Bitewing examination is helpful for detecting hidden lesions in the approximal surface and is an essential aid for clinical diagnosis. This study aimed to assess the prevalence of approximal carious lesions from radiograph and treatment given. A retrospective record review study was carried out on 239 clinical records of patients age 14 and above who attended in dental clinic of HUSM from January 2006 to December 2009. Readable bitewings from distal surface of second molar to mesial surface of first premolar were assessed for the absence / presence and depth of caries. Caries prevalence, distribution of caries and treatment given were calculated by frequency (%). A total of 4573 surfaces were examined. Lesions confined to the outer half of the enamel and inner half of enamel were found in 7.1% and 3.8% of surfaces respectively. Lesions in outer half of dentine were 2.8% and lesions beyond the outer part of the dentine were 4.3%. No treatment was given for most of the surfaces with radiolucency in the enamel. Topical fluoride was given in the 4% of outer and 8.8% of inner half of the enamel. While surface with caries extend into dentine (59.7%) and more than half of dentine (58.6%) were replaced with restoration. The more extensive treatment such as RCT and extraction were found in 22.7% of dentinal caries surface. Both enamel and dentine caries prevalence was low. Most enamel caries were not intervened. Preventive intervention was given more in enamel caries. Dentinal caries were restored according to the depth.

CL-O-3
Effectiveness of different tongue cleaning methods on bacterial load and halitosis

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Many methods of tongue cleaning have been utilized to remove debris on the tongue surface and improve halitosis. This study aimed to compare the effectiveness of different methods of tongue cleaning practice on bacterial load and halitosis score. This is an experimental clinical study whereby twenty subjects (n=20) with good oral hygiene and no abnormal tongue were carefully selected and divided into four groups. Subjects in each group were subjected to different tongue cleaning methods. Evaluations occurred at four times, when the subjects had their halitosis quantified with Halimeter® machine (Interscan Co, Chatsworth, CA) and samples from posterior part of the dorsum of the tongue were taken with sterile cotton swabs. Samples were cultured on sheep blood agars within 2 hours and colony forming unit/sample (CFU/sample) were obtained after 24 to 48 hours. Data were analysed statistically using Wilcoxon signed ranked test with $p<0.05$ indicates statistical significance. Bacterial counts were observed to significantly reduced ($p=0.043$) at all times after intervention in subjects who used conventional tongue scrapper. Halitosis score were significantly reduced ($p=0.043$) immediately after intervention for all groups and after six hours of intervention in subjects who

used tongue scrapper at the back of the toothbrush. Halitosis scores increased after 24 hours in all groups. In conclusion, the findings demonstrated the importance of mechanical cleaning of the tongue in reducing bacterial counts and improving halitosis. The evaluated methods of mechanical tongue cleaning were effective in reducing bacterial counts and halitosis with the conventional tongue scrapper demonstrating the most effective method.

CL-O-4
The evaluation of the effect of the different scaling modalities on the root surfaces

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There are many types of scaling devices available in USM dental setting. However, the effect of these scaling devices on calculus removal and surfaces roughness was unknown. This study was designed to investigate the effectiveness of different scaling devices on the root surfaces. This is an experimental laboratory study whereby 24 extracted single rooted human permanent teeth were used. The teeth were assigned to four groups: (1) EMS scaler; (2) Gracey curette #5/6; (3) Satelec scaler; (4) Kavo scaler. Artificial calculus was created on the coronal third of the proximal area of the root for 5mm². The length of procedural time was recorded. After instrumentation, surfaces roughness and calculus remaining were assessed using digital microscope Hirox KH-7700 version 2.0 (Hirox Japan) under x50 magnification. Statistical analyses were performed using ANOVA and post hoc Tukey HSD with P< 0.05 indicate statistical significance. The results showed significant difference between the times taken to scale until clinically satisfactory between EMS, Kavo and Gracey scaler. With respect to surface roughness evaluation, a significant difference was observed among Satelec, Kavo and Gracey curettes. With respect to calculus remaining, there was significant difference between EMS and Kavo scaler. In conclusion, EMS and Kavo took lesser times compared to Gracey curettes. Gracey cause more roughness compared to Satelec and Kavo scaler.

CL-O-5
A study of periodontal status on patients with type II controlled and uncontrolled diabetes mellitus

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Periodontal disease has long been shown to have significant relationship with Diabetes Mellitus (DM) Type 2. A comparative cross sectional study was conducted to compare the periodontal status between controlled and uncontrolled DM Type 2 and their association. Sixty two patients attended Diabetic Clinic Hospital Universiti Sains Malaysia (HUSM) were randomly selected. Sociodemographic data (age, sex, education level and smoking habit) were obtained and plaque score, gingivitis score as well as pocket depth were recorded. The patients were classified into controlled and uncontrolled DM Type2; based on the level of HbA1c. HbA1c of more than 7.0 was classified as uncontrolled. Data were analysed using SPSS version 17. Majority (70.9%) of the patients are uncontrolled,(HbA1c>7.0). Nineteen patients (95%) that had periodontitis were in uncontrolled group and only

1(5%) was in controlled group. The prevalence of periodontitis in controlled DM type2 was 6.0% (95% CI: 6.0%, 17.0%) where as in uncontrolled was 43.0 % (95% CI: 28.0%, 58.0%). The mean plaque score was significantly higher in uncontrolled diabetic (79.5, SD 31.64), p<0.05, compare to controlled (21.4, SD 12.64). Mean gingivitis score in uncontrolled DM type2 was significantly higher (87.1, SD 24.6) compared to controlled (28.1, SD 15.46), p<0.05. There was a significant association between uncontrolled DM and periodontal disease (p<0.05).The severity of periodontitis was also significantly associated with control of diabetes (p<0.05) where patients with uncontrolled DM type2 had severe forms of periodontitis (pocket depth>5mm). Thus the control of diabetic status would minimize the occurrence of periodontal disease.

CL-O-6
Comparison of the microleakage of composite resin and porcelain in restoring non-carious cervical lesion

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Composite resin is one of the most common materials used in restoring non-carious cervical lesion (NCCL) has disadvantage in polymerization shrinkage that could lead to microleakage. The purpose of this study is to compare the depth of microleakage between composite resin and porcelain in restoring NCCL *in vitro*. Class V cavities measuring 5mm x 3mm x 2mm depth were prepared on the buccal surfaces of 62 extracted premolar teeth. The teeth were randomly assigned into 2 groups of 31 teeth each where Group I was restored with Filtek Z350 (3M ESPE, USA) and Group II was cemented with all ceramics cervical veneer. All teeth were then subjected to 500 thermocycles between 5 and 55°C before immersion in 2% methylene blue dye for 24 hours. Dye penetration was measured using Leica imaging system (U.K.). Independent t test was used to analyze the results with $p<0.05$ considered to be significant. The results demonstrated that porcelain showed statistically lesser microleakage depth for the cervical margins ($p=0.018$) but no significant difference for the coronal margins ($p=0.669$) in comparison with composite restorations. The depth of microleakage at the cervical margins is significantly deeper than the coronal margins in composite restorations ($p=0.006$). No significant differences in microleakage depth for porcelain restorations in both coronal and cervical margins ($p=0.600$). In conclusion, porcelain cervical veneer could be a good alternative treatment option in restoring NCCL with better strength and esthetic.

CL-O-7
Oral clefts in Universiti Sains Malaysia: a 5 years record review

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Demographic data shows that the presentation of oral clefts varies according to geographical region. However, there was minimal published data regarding the presentation of oral clefts in Hospital Universiti Sains Malaysia (HUSM). Thus, a retrospective record review was done of patients presenting with oral clefts at HUSM from January 2005 to December 2009. There were 210 patients who presented to HUSM with oral clefts. Demographically, oral clefts were evenly distributed among males and females and the majority of them were Malay (97.6%). A positive family history of oral clefts was seen in 11.4%. The prevalence of syndromic oral clefts was determined to be 8.0% (95% CI: 4.0% - 11.0%). The mean maternal age at birth was 31 years of age (SD: 6.90). There was no significant association between maternal age at birth and syndromic oral cleft cases. The most common cleft of the primary palate was complete left unilateral cleft lip and alveolus (7.6% of all cases) whereas the most common cleft of the secondary palate was complete left cleft lip and palate (19.0%). Millard rotation and advancement lip repair was the most common treatment performed with 58.6% of all cases followed by Veau Kilner palatoplasty (55.7%). In conclusion, this study has provided latest additional data regarding the presentation of oral clefts in HUSM for proper planning of oral cleft management.

CL-O-8
Xerostomia among elderly in Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan

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Xerostomia is a subjective feeling of dry mouth and best assessed by directly questioning the individuals. A cross sectional study was conducted to determine the symptoms of xerostomia among elderly in Hospital Universiti Sains Malaysia (HUSM). Two hundred and forty three elderly aged between 60 to 90 years were selected by systematic random sampling. Socio-demographic data was obtained and Xerostomia Inventory was used to measure symptoms of xerostomia. Data were analysed using SPSS version 18.0. The mean age of the respondents was 67.4 years (SD 5.93) with 53.5% being male. The majority of them were Malays (95.5%) and 25.9% were smokers. Regarding their oral hygiene practice, all of them brushed their teeth once a day using tooth paste and 55.1% sought dental check up when needed. As for Xerostomia Inventory, 26.3% had to sip liquids to aid in swallowing food, 38.7% had dry mouth when eating meal, 26.7% had to suck candy to relieve dry mouth, 67.1% felt dry lips, 23.5% had difficulties swallowing certain foods, 67.5% seldom felt their mouth dry and 64.6% needed to get up at night to drink. However, majority had never felt dry eyes, had difficulty in eating dry foods or difficulty in swallowing. There were significant association between smoking and sip liquids to aid in swallowing, dry mouth when eating, suck candy to relieve dry mouth, lips feel dry, difficulties in swallowing certain foods, mouth feels dry, get up at night to drink, difficulty eating dry foods and difficulty in swallowing ($p< 0.001$). In conclusion, there are some degrees of xerostomia among the elderly and smoking was significantly associated with most of the dry mouth symptoms. Hence, elderly individuals need to be informed about oral care and be advised to seek dental check up regularly.

CL-O-9
Survey on dental anxiety among adults attending government outpatient dental clinic

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Dental anxiety is one of the major factors that hinder patients from stepping into dental clinic. A comparative cross sectional study was conducted to determine the

prevalence of dental anxiety among adults attending Hospital Universiti Sains Malaysia (HUSM) outpatient dental clinic and Pasir Puteh Dental Clinic (PPDC) as well as to compare the level of anxiety on dental treatment and procedures provided between two hospitals. Adult patients attending HUSM (235) and PPDC (91) aged 15 years and above, were randomly selected. Socio-demographic profiles were obtained and self-administered "Modified Dental Anxiety Scale" and "single anxiety" questionnaire were used to measure the dental anxiety. Data were analysed using SPSS version 18.0. More female patients attended both HUSM and PPDC, 60% and 61.5% respectively. Malays made up 92% attendees for HUSM and 97.8% for PPDC. The prevalence of dental anxiety was high for both hospitals, 91.2% (95%CI: 87.66, 94.74) and 90.1% (95%CI: 83.86, 96.36) in HUSM and PPDC respectively. However, there was no significant difference of dental anxiety score towards all dental treatments between HUSM and PPDC ($p>$ 0.05). Patients were anxious more on tooth drilling and local anaesthetic injections in both hospitals. Thus, oral healthcare workers should be more aware about the presence of dental anxiety among patients and be very cautious while conducting dental procedures, especially drilling tooth or injecting local anaesthetic, which patients fear most. To ensure regular uptake of dental services, the dentists have the responsibility to eliminate dental anxiety by paying more attention, care and empathy towards patients.

CL-O-10
Assessment of dental fear and anxiety among Malay adolescents in Kubang Kerian secondary school

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Fear is an emotional response to a perceived threat. Dental fear and anxiety may cause management problems during dental treatment leading to partial or total avoidance of treatment and leads to compromised dental health. This study aims to determine the prevalence of fear and anxiety among adolescents and identify symptoms and common items of fear using the Malay version of Dental Fear Survey (DFS). This cross sectional study involved 215 randomly selected adolescents aged between 13 to17 years from SMK Kubang Kerian I. There were 46.5% boys and 53.5% girls. Symptoms of fear were in the following order: nausea during dental procedure, perspiration, muscle tension, increased breathing rate and increased heart beat. The majority of respondents (75.3%) fear the feeling of needle injected in their mouth followed by fear of seeing the anaesthetic needle (70.2%). 69.3% fear of the dental drill, followed by fear of the vibration feeling of the drill (67.4%) and fear of hearing the drill (62.4%). About 57.2% cancelled their appointments due to fear followed by 47% who had fear, once seated on the dental chair. Interestingly, boys fear more of the needle being injected in their mouth and seeing the anaesthetic needle. Girls fear more of seeing, hearing, feeling the vibration of drill and sitting on the dental chair. Overall rating of fear of dental treatment showed girls were more afraid than boys and that the Malay DFS is useful to identify symptoms and items of fear among Malay adolescents.

CL-O-11
Emotional intelligence and perceived stress among undergraduate dental students in Universiti Sains Malaysia

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The objective of this study was to determine the level of emotional intelligence (EI) among undergraduate dental students and its association with perceived stress (PS). This was a cross sectional study of all undergraduate dental students in the 2009/2010 academic year in the School of Dental Sciences, Universiti Sains Malaysia. A total of 234 students participated in this study, a response rate of 84.5%. Two sets of self-administered questionnaires, the Assessing Emotions Scale and the Perceived Stress Scale (PSS-10) were used. Most of the respondents were females (76.1%) with a mean age of 22.2 years (SD 1.54). It was apparent that the majority of the students were satisfied with decision to study dentistry (95.3%). The mean scores for EI and PS were 121.2 (SD 11.85) and 21.2 (SD 5.08) respectively. The EI scores were significantly higher in female students [122.0 (SD 11.57)] and in those whose decision to study dentistry was their own [123.1 (SD 10.81)]. Meanwhile, the PS scores were significantly higher in students in the clinical years [22.2 (SD 5.25)], whose career selection was not of their own [22.5 (SD 4.90)] or made by their parents [(22.4 (SD 4.95)]. Correlation analysis revealed a significant inverse relationship between EI and PS (r= -0.377). In conclusion, students with higher EI were more likely to experience lower PS. Self-motivation to study dentistry seemed to have a positive influence on both the students' EI and ability to cope with stress.

CL-O-12
Posture assessment of dental practitioners in Hospital Universiti Sains Malaysia

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Working in general dentistry is a high risk profession for the development of poor posture habits which may lead to musculoskeletal disorders. This is because dental procedures require high visual demands of the operator which may result in adoption of affixed postures. A cross sectional study was conducted to determine the posture habits of dental practitioners during dental procedures in Hospital Universiti Sains Malaysia (HUSM). Sociodemographic profiles (age, sex and ethnicity), general medical history and history of back pain were obtained. Posture assessment was done using Branson's Posture Assessment Index (BPAI) and later classified into acceptable (10-40 points), compromised (41-80 points) or harmful (81-194 points). Data were analysed using SPSS version 18.0. A total of 60 dental practitioners participated in this study. The majority (83.3%) of the practitioners were female and 66.7% were Malays. Their mean age was 23.4 years (SD 2.28). At the time of study, few of the practitioners (13.3%) were having medical problems and 15 (25%) of them have histories of work-related back pain. The majority (63.3%) of them had an acceptable posture, 36.7% showed compromised posture and none of them displayed a harmful posture during their dental procedures. Thus, knowledge regarding correct postures while doing dental procedures needs to be strengthened through relevant occupational health programs. A cohort study is needed to establish the relationship between poor posture and musculoskeletal disorders among dental practitioners.

P1

Non-Hodgkin's lymphoma involving maxillofacial regions among children treated in HUSM: a retrospective study

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Lymphoma represent about 12% of paediatric malignancies, 60% of them is Non Hodgkin's lymphoma (NHL). This retrospective study was conducted to determine the clinical features of NHL involving maxillofacial regions in children aged from 1 to 16 years, who seeked treatment at Hospital Universiti Sains Malaysia (HUSM) from January 1999 to December 2009. There were 26 cases diagnosed with NHL, 23 cases involving maxillofacial regions (20 boys and 3 girls). There were 22 (95.7%) Malays and 1 (4.3%) Chinese. The highest frequency occurred between the age of 9 to 12 years (47.8%). Nine cases (39.1%) presented with facial swellings as the main presenting complaint, followed by neck swellings (8.7%), gingival swellings (4.3%), difficulty in swallowing (4.3%), and other extra-oral complaints such as abdominal pain (30.4%). The main maxillofacial sign and symptom were facial swellings (52.2%) and cervical lymphadenopathy (43.0%). Seven cases (30.4%) involved the maxilla and palatal bone, 4 (17.4%) cases involved the mandible and 4 (17.4%) cases involved the vestibules and gingiva. All diagnoses were made through histopathological study with main specific diagnoses of large B cell lymphoma (34.8%), Burkitt's lymphoma (26.1%) and small lymphocytic lymphoma (26.1%). Sixty-five percent of patients survived. In this study, facial swelling and cervical lymphadenopathy were the main clinical features of NHL. Therefore, NHL cannot be ignored as a differential diagnosis, especially when patients present with these features in the dental clinic. Early diagnosis and immediate referral for further management may increase survival chance of patients.

P2

A preliminary study: immunological status and caries experience of adults attending HUSM dental clinic

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Dental caries is one of the most prevalent chronic diseases affecting people worldwide. It is one of the most common bacterial infections in humans. Studies have shown that the immunological response of dental caries in children and adults vary. The immunological status of patients with dental caries may help in long term management of the problem. This study aims to evaluate the levels of serum immunoglobulin G, A and M among adults and to determine its association with caries experience. Thirty healthy adults aged 18 years and above attending the HUSM Dental Clinic were randomly selected. Oral examination was done to determine caries experience using the DMFT index. Blood samples were taken and serum immunoglobulin levels (IgG, A and M) were analysed using nephelometer. The study was approved by Universiti Sains Malaysia Human Ethics Committee. There were 9 males and 21 females. Majority of them were Malays (86.7%) and 13.3% were Chinese. They were grouped according to low (DMFT=0), moderate (DMFT=1-4) and high (DMFT>4) caries experience. Serum immunoglobulin G, A and M levels was found to be normal in all groups. There was no significant association between serum immunoglobulin levels and caries experience. Although caries experience varies widely, the serum immunoglobulins levels were within the normal range. Thus, studies with a bigger sample size need to be carried out to evaluate the immunological status and its association with caries experience in future.

P3

The antibacterial properties of locally used toothpastes against *Streptococcus mutans*

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Streptococcus mutans (SM) is the chief pathogen that is responsible for human dental caries. Maintaining long-term *SM* suppression is feasible with currently available commercial toothpastes and can be expected to result in significant caries inhibition. This in vitro study was carried out to determine the antibacterial properties of locally used toothpastes against *SM*. Simple discs diffusion method were used to evaluate the antibacterial properties of six toothpastes against *SM*. Three fluoridated and non-fluoridated toothpastes were tested respectively. Penicillin and distilled water serves as positive and negative control, respectively. *SM* was spread onto blood agar in a Petri dish. The samples were tested at full strength and 1:2 dilutions. Zone of inhibition (ZOI) were measured in millimetre after 24 hours of incubation at 37ºC. The test was done in triplicate. Data was analysed by Mann-Whitney test. All tested toothpastes demonstrated antibacterial property towards *SM*. Penicillin produced significant size of ZOI while distilled water showed no observable inhibition zone. One of the non-fluoridated toothpastes obtained the greatest mean of ZOI at both concentrations, suggesting that it provides the greatest antibacterial effectiveness against *SM.* One of the non-fluoridated and fluoridated toothpaste showed the weakest ZOI at full strength and at 1:2 dilutions respectively. These results suggest that fluoridated toothpastes were not necessary to have a good antibacterial effectiveness upon *SM* compared to non-fluoridated toothpastes. In addition, the variations in antibacterial efficacy among the tested toothpastes indicate that more research is needed to validate their effectiveness claims.

P4

Determination of minimal inhibitory concentration (MIC) of *Punica granatum* L. on oral bacteria: an *in vitro* study

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Many studies have been conducted to determine the antibacterial activity of various natural products. The objectives of this study were to determine the minimal inhibitory concentration (MIC) of *Punica granatum* on oral bacteria - *Pseudomonas aeruginosa, Streptococcus mutans, Staphylococcus aureus, Streptococcus oralis* and *Streptococcus sanguis* and to ascertain its antibacterial effects against these bacteria. Both ethanol and water extract of the pulp and seeds and the inner yellow separator of pomegranate in 4 different concentrations (1g/ml, 0.5 g/ml, 0.25 g/ml and 0.12 g/ml) were used in

this study. Pomegranate extracts were poured into five wells prepared on agar plates of cultured oral bacteria including control. The inhibition area was observed after 24 hours incubation and the most diluted concentration with inhibition zone was selected. Serial dilution was done on the selected concentration and poured into agar plates which were then cultured with bacteria and incubated for another 24 hours. After the second incubation, the most diluted concentration with inhibition zone was marked as minimal inhibitory concentration (MIC). Results showed that ethanol extract of both pulp and seed, and inner yellow separator showed bactericidal effects against all oral bacteria. For alcohol extract, the results of MIC: *pseudomonas aeruginosa*: inner yellow separator 0.06g/ml and pulp 0.9g/ml, *Streptococus mutans*; inner yellow separator 0.12g/ml and pulp 0.9g/ml, *Staphylococcus aureus*; inner yellow separator and pulp 0.06g/ml, *Streptococus oralis*; inner yellow separator 0.06g/ml and pulp 0.25g/ml and *streptococcus sanguis*; inner yellow separator 0.06g/ml and pulp 0.25g/ml.

P5
Inflammatory cytokines and osteogenic potential of stem cells from human exfoliated deciduous teeth (SHED)

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Stem cells from human exfoliated deciduous teeth (SHED) are highly proliferative, clonogenic cells capable of differentiating into osteoblasts and inducing bone formation. It is a potential alternative for stem cell bone regeneration therapy. However, stem cell therapy carries risk of immune rejection mediated by inflammatory cytokines of human defence system. This preliminary research studies the interaction between SHED and the immune system by determining the inflammatory cytokines profile and osteogenic potential of SHED. Human fetal osteoblasts (hFOb) cell line and isolated SHED were cultured and total RNA was extracted, followed by reverse transcription cDNA synthesis. Semi-quantitative reverse transcription PCR and Multiplex PCR was performed to detect expression levels of OPG/RANKL and TNF-α, IL-1β, IL-6, IL-8 and TGF-β in both cell types. Analysis showed that SHED expressed significantly lower amounts of IL-1β, IL-6, and IL-8 compared to hFOB. IL-1β is a potent bone-resorbing factor, while IL-6 and IL-8 induce osteoclastogenesis and osteolysis respectively. SHED did not express TNF-α which stimulates osteoclastic activity. SHED demonstrated high OPG/RANKL ratio, in contrast with low OPG/RANKL ratio in marrow stem cells described in previous studies. Our findings suggest that SHED may have improved immunomodulatory profile in terms of promoting relatively lower inflammatory reaction during transplant and enhancing bone regeneration. In conclusion, SHED is an ideal source of osteoblasts to be used in bone regeneration therapy. Further studies on the immunomodulatory properties of SHED-derived osteoblasts are necessary to enable stem cell therapy in immunocompetent hosts.

P6
Antibacterial effect and determination of minimal inhibitory concentration of *Etlingera elatior*

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Long time ago, plants have been used as valuable source of natural products for maintaining human health. The objective of this study is to confirm the antibacterial effect and determine the minimal inhibitory concentration (MIC) of Bunga kantan (*Etlingera elatior*). This is an *in vitro* experimental study that involves 5 types of bacteria and one natural plant. The bacteria are *Pseudomonas aeruginosa, Streptococcus mutans, Staphylococcus aureus, Streptococcus oralis* and *Streptococcus sanguis* Agar well diffusion method was used to confirm the antibacterial effect of bunga kantan. 1 g/ml of bunga kantan extract was used as a stock solution and diluted into 3 different concentrations to look for zone inhibition in the agar wells. It showed that bunga kantan water extract had no antibacterial effect because no zone of inhibition was seen but the ethanol extract of bunga kantan showed the zone of inhibition at 0.125 g/ml concentration. For determination of minimal inhibitory concentration, 0.125 g/ml of bunga kantan ethanol extract were diluted into 4 different concentrations. The agar plates were incubated for 24 hours and the most diluted concentration but still showing zone inhibition after 24 hours incubation was selected as MIC. The MIC value of bunga kantan ethanol extract against *Streptococcus mutans, Pseudomonas aeruginosa Streptococcus oralis* and *Streptococcus sanguis* were found to be 0.0625 g/ml and MIC value for *Staphylococcus aureus* was 0.0312 g/ml. In conclusion, this study proved the antibacterial activity towards the experimental bacteria, but further study is needed to find out the active substances in this plant.

P7
Suppression effect of *Mikania micrantha* leaves extract on anti-cancer activities of osteosarcoma cells

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Therapeutic effects from natural products such as plant extracts become well known products among consumers. This guided to diverse researches investigating the natural products therapeutic potential including in anticancer properties. *Mikania micrantha* from the family Asteracea is an extensive weed in the tropics, well known its uses in healing new wounds and treating skin irritations. In this preliminary *in vitro* study, crude extract from *Mikania micrantha* leaves was used to study its suppression effect on osteosarcoma cells. The main aim was to determine the inhibitory concentration at 50% of the leaves extract and to determine the cell proliferation assay under confocal microscope analysis. Leaves extract was prepared by blending 30 mg leaves with 90 ml distilled water and subsequently used in various concentrations to treat the cultured osteosarcoma cells. The osteosarcoma cells were exposed to the leaves extract for three days at various concentrations and live cells concentration was counted using hemocytometer. *Mikania micrantha* leaves extract concentration at 0.7% (determined IC_{50}) showed suppression effects on the cultured cells by reducing the degree of cells proliferation till six days. Hence, additional studies are required to determine its genotoxicity and cytotoxic effect on normal cells (osteoblasts), *in vivo* systemic effect and molecular mechanism of apoptosis in order to disclose the factual potential of this local plant as a chemopreventive agent in the future.

P8
Analysis of cytotoxicity of different generations of dentin bonding agents on stem cells from human exfoliated deciduous teeth

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Dental bonding agents (DBA) are used to enhance bonding strength between resin and tooth structure. Since DBA come into close and prolonged contact with vital dentin, their influence on pulp tissue is of great interest. Thus, their biocompatibility should be investigated. The purpose of this study was to evaluate and compare the cytotoxicity effect of three different generations of DBA on Stem Cells from Human Exfoliated Deciduous Teeth (SHED). This is an experimental-based *in-vitro* study whereby 5th (two-step-etch-and-rinse, Adper Single Bond 2, 3M ESPE, USA), 6th (Xeno III, Dentsply, Germany), and 7th (Adper Easy Bond, 3M ESPE, USA) generations of DBA were light-cured, extracted and plated in 96 multi-well plates respectively. SHED were seeded on each well with 7 different concentrations of DBA ranging from 1.563mg/ml to 100mg/ml and incubated at 37°C for 72 hours. MTT assay was performed. The estimation of 50% inhibitory concentration (IC_{50}) values for each DBA was used to determine the cytotoxic effect. Statistical analysis was performed using Kruskal-Wallis, followed by Mann-Whitney with $p<0.05$. IC_{50} for each DBA was 75mg/ml, 9.375mg/ml, and 12.5mg/ml respectively. The cytotoxic effect was significant with $p=0.018$. A significant difference was found between 5th and 6th generations ($p=0.012$) as well as 5th and 7th generations ($p =0.036$). Sixth and 7th generations showed no significant difference ($p=0.270$). In conclusion, different generations of DBA give different level of cytotoxic effect to human pulp cells. Fifth generation showed the least cytotoxic effect followed by the 6th and 7th generations whereby both were statistically not significant.

P9
Prevalence of localized benign oral soft tissue tumour-like lesions at Hospital Universiti Sains Malaysia

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Soft tissue tumour-like lesion is defined as any pathologic growth that projects above the normal surface contour. The aim of this study was to determine the prevalence of localized benign oral soft tissue lesions among patients attending the Hospital Universiti Sains Malaysia (HUSM). A retrospective review of 87 hospital records of patients who were seen over a seven-year period (January 1, 2003 to December 31, 2009) was performed. The lesions were classified according to their histopathological type into either fibrous or haemorrhagic. Information related to sex, age and race of the patients as well as anatomical sites of lesions were obtained. The majority of the patients were females (74.7%) and the Malays (85.1%). The mean age of the patients was 37.2 years (SD 20.0), and the young age groups between ≤20 years and 21-30 years (21.8%) each were predominantly affected. The fibrous lesions were more prevalent (67.81%) than the haemorrhagic lesions (29.9%) and most of the lesions were found in the gingival region (51.7%). In conclusion, patients with localized benign oral soft tissue lesions at HUSM were mainly Malays, females, and in the young age group. Fibrous lesions were the predominant type seen and the gingival region was the most commonly affected. This knowledge may facilitate diagnosis and early detection of the localized benign oral soft tissue lesions and hence minimize possible dentoalveolar complications.

P10
A study of anti-plaque efficacy and taste perception of *Calendula officinalis* mouthrinse

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An ideal mouth-rinse must have an acceptable taste and very efficient anti plaque activity. This study evaluated an herbal mouth-rinse (Plandula®), containing extracts of *Calendula officinalis* and other specified herbs, for such characteristics. Although previous studies have compared this product with a placebo, it has not been evaluated against chlorhexidine in any study so far. The purpose of this study was to determine the efficacy of a commercial mouth-rinse (Plandula®) in controlling dental plaque and to evaluate acceptability of its taste in comparison with chlorhexidine. Sixteen volunteers participated in this double blind, crossover, randomised clinical trial. Dental prophylaxis was given to all participants at the beginning of the study. During the first period of 3 days, the participants were asked to rinse with 10 ml of allocated mouth-rinse 3 times daily for 30 seconds after brushing their teeth, which was done without toothpaste on all surfaces, except palatal and lingual. On the fourth day, the participants returned for measurement of plaque on the palatal and lingual surfaces by Quigley Hein Index (modified by Turesky). The second period of another 3 days commenced after an intervening 4-day washout period. The same procedures were prescribed to the participants but using the other mouth-rinse. They were also asked to taste both mouth-rinses and evaluated them on a Visual Analogue Scale (VAS) of 0 to 10, 0 being plain taste and 10 for bitter taste. The results showed that the difference in plaque score following Plandula® mouth-rinse was not significantly different ($p=0.068$) compared to chlorhexidine mouth-rinse. The mean VAS score for Plandula® taste perception was significantly lower than that for chlorhexidine ($p<0.001$). In conclusion, Plandula® mouth-rinse is as effective as chlorhexidine in controlling dental plaque accumulation and it has an acceptable taste.

P11
Prevalence of oral mucosa fibroma among patients attending HUSM dental clinic year 2006-2010

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Fibroma of the oral mucosa is the most common benign tumor of the oral cavity. It is a reactive hyperplasia of fibrous connective tissue in response to local irritation or trauma. A lesion on any part of the oral mucosa have a broad differential diagnosis ranging from traumatic lesions (mucocele), neurogenic lesions (neurofibromatosis), lipoma , epithelial tumors (squamous papilloma) and inflammatory/reactive hyperplasia of soft tissue (pulp polyp). This preliminary retrospective study investigates the prevalence of fibroma in oral mucosa among patients attending USM dental clinic from 1/6/2006-1/6/2010. A total number of 192 patients (82 males and 110 females) who are registered in the Oral Medicine and Oral Pathology Log Book are included in this study regardless of their age. Sixteen percent (16 %) of them are diagnosed with fibroma and out of that, 29% of them are males and 79% are females. The peak incidence of the lesion was in the third decade of life. The lesions occurred in the tongue, lip mucosa, sulcus region and buccal mucosa are 12.9%, 12.9%, 32.2 % and 41.9% respectively. This study shows that fibroma is one of the common oral mucosal lesions and it occurred mostly in the third decade of life where the prevalence is higher in female patients.