Three-dimensional Quantification of Residual Ridge Resorption in Edentulous Maxilla

MOHAMED SAMIH ALSROUJI[1], ROHANA AHMAD[1]

[1]Department of Prosthodontics, Faculty of Dentistry, Universiti Teknologi MARA, Malaysia

Email: alsrouji11@yahoo.com; drrohana@salam.uitm.edu.my

Introduction: Quantification of edentulous maxillary bone has an important influence in choosing the appropriate dental treatment modality which associated with minimal bone resorption. Several difficulties are associated with the conventional methods of quantification such as low density of maxilla and overlapping of maxilla with spine in 2D radiographs. Furthermore it is difficult or impossible to identify the specific locations of reduction by using 2D technique. **Objectives:** To develop a 3-D radiographic technique to locate and quantify predominant areas of bone remodelling in the maxilla by depending on the technology available in dentistry. **Methodology:** CBCT 3-D images were taken of 8 edentulous patients who received maxillary complete dentures and mandibular implant-retained overdentures, at two points: T1 pre-treatment, T2 one year post-treatment. These images converted to Mimics research software and 3D models of each patient were calculated for every time point. Superimposition have been done for these models. Subsequently these superimposed models were exported to 3-matics software to reveal the predominant areas of bone remodeling. **Result:** This study showed the maxillary bone reduction ranged between 2.86 % and 12.18 % with a mean of 7.24%. The mean locations of resorption was in the buccal aspect of premaxilla and at the top of anterior crest. **Conclusion**: This novel technique allows precise quantification of maxillary bone remodeling and permits objective comparison of the effect of various treatment approaches on maxilla.

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Xerostomia, Salivary Flow Rate, and Periodontal Status in Patients with Type II Diabetes Mellitus

NORSILA AW , IZNI IWANI M, HASLINA T

School of Dental Sciences, Universiti Sains Malaysia Health Campus, Kota Bharu, Kelantan

Email: norsila@usm.my; haslina@usm.my

Introduction: Diabetes and periodontal disease have an established bidirectional relationship. Other symptom associated with diabetes is xerostomia, or a dry mouth sensation, which affects patient's oral condition. **Objectives:** The objectives were to evaluate xerostomia and determine salivary flow rate and periodontal status in patients with Type II diabetes mellitus (T2DM); as well as to determine association between salivary flow rate with (i) periodontal parameters, and (ii) HbA1c level. **Methodology:** This was a cross sectional study of controlled T2DM patients attending Diabetic Clinic, Hospital USM. They answered questionnaires regarding xerostomia, gave their saliva sample for analysis, and underwent periodontal examinations. Descriptive statistics, independent t test, Pearson's correlation, and Chi-square test were computed using SPSS software version 22.0. **Results:** Among the 66 patients, 62 had periodontal disease where 41.9% of them presented with mild periodontitis, followed by mild-moderate (30.6%), moderate-severe (17.7%), and severe (9.7%). Mean (SD) periodontal parameters recorded were: Plaque index, PI=1.68 (SD 0.52); gingival index, GI=1.88 (SD 0.52); periodontal pocket depth, PPD=2.93 mm (SD 1.00); clinical attachment loss, CAL=3.69 mm (SD 1.46); and alveolar bone loss, ABL=3.77 mm (SD 1.14). Mean stimulated salivary flow rate was 1.63 mg/min (SD 0.94). Majority of them have normal salivary flow, with 25.8% having reduced salivary flow rate (< 1.0 mg/min). Xerostomia was reported in 15.9% of the patients. There was significant association between level of HbA1c and salivary flow rate ($p<0.05$). No significant correlation between periodontal parameters and salivary flow rate were computed. **Conclusions:** Prevalence of periodontitis among controlled diabetic patients was high; however, it did not correlate with salivary flow. Nevertheless, the fact that saliva flow rate is associated with HbA1c level is exciting. Further research towards developing this method to assess early neuropathy in diabetics would be beneficial in patient management as early intervention could improve their quality of life.

Reverse Twin-Block and Reverse Pull Face Mask in Early and Late Mixed Dentition In Children

NASHID FAREEN [1], MOHAMMAD KHURSHEED ALAM[1], MOHD FADHLI KHAMIS[2], NOREHAN MOKHTAR[3]

[1]Orthodontic Unit, School of Dental Science, Universiti Sains Malaysia, Kelantan, Malaysia; [2]Forensic Dentistry/Oral Biology Unit, School of Dental Science, Universiti Sains Malaysia, Kelantan, Malaysia; [3]Craniofacial and Biomaterial Science Cluster, Advance Medical Dental Institute Bertam, Universiti Sains Malaysia, Penang

E-mail: n.fareen@yahoo.com; dralam@gmail.com

Introduction: Appropriate functional appliance and starting age of management are two most vital factors in correction of Class III malocclusion. As functional appliances produce dentoskeletal effects mostly; their effects on soft tissue was never under spotlight, though soft tissue plays a major role in both aesthetic and function. **Objective:** To compare and analyze the soft tissue changes produced by Reverse Twin-Block appliance (RTB) and/or Reverse Pull Face Mask appliance (RPFM) in early and late mixed dentition Malay children having Class III malocclusion. **Method:** The total sample was 95 Malay children; both early (8-9years) and late (10-11years) mixed dentition group. Forty-nine patients (8-9 years, 11 males and 13 females; 10-11 years, 11males and 14 females) treated with RTB were compared with a group of forty-six patients (8-9 years, 8 males and 12 females; 10-11 years, 12 males and 14 females) treated with RPFM. For each subject of the RTB and RPFM group; pre-treatment (T1) and post-treatment (T2) cephalometric changes were assessed by Holdaway analysis using CASSOS software. Paired and independent t-test was used for statistical analysis. **Result:** Paired t-test revealed significantly increase in seven out of eleven values of RPFM in both age groups; whereas no significant changes were found in RTB group. Independent t-test showed statistically significant changes in nose prominence in RPFM and in basic upper lip thickness and lower lip to H-line values in RTB in comparison of early with late mixed dentition group. No significant changes found in post-treatment in between RTB and RPFM group. **Conclusion:** Both of the appliances effectively produced soft tissue changes in both age groups. RPFM revealed significantly more favorable soft tissue changes; particularly in late mixed dentition group.

Phenotype and Postnatal Factors Affecting Dental Arch Relationship of UCLP Patients in a Bangladeshi Population

SANJIDA HAQUE[1], MOHAMMAD KHURSHEED ALAM[1], MOHD FADHLI KHAMIS[2]

[1]Orthodontic Unit, School of Dental Sciences, Health Campus, Universiti Sains Malaysia.16150 Kubang Kerian, Kelantan, Malaysia. [2]Forensic Dentistry/Oral Biology Unit, School of Dental Sciences, Health Campus, Universiti Sains Malaysia 16150 Kubang Kerian, Kelantan, Malaysia

Email: dr.sanjidahaque@gmail.com; dralam@gmail.com.

Introduction: Cleft lip and palate (CLP) is one of the most common birth defects. Multiple factors are believed to be responsible for an unfavorable dental arch relationship (DAR) in CLP. Facial growth (maxillary) retardation, which results in class III malocclusion, is the primary challenge that CLP patients face. Phenotype factors (UCLP type, UCLP side, family history of cleft, family history of class III) and postnatal treatment factors (cheiloplasty, palatoplasty) may influence treatment outcomes in unilateral cleft lip and palate (UCLP) children, which has led to a great diversity in protocols and surgical techniques by various cleft groups worldwide. **Objectives:** The aim of this retrospective study was to evaluate DAR of non-syndromic unilateral cleft lip and palate (UCLP) and to explore the various phenotype and postnatal treatment factors that are responsible for unfavorable DAR. **Methods**: 84 dental models were taken before orthodontic treatment and alveolar bone grafting. The mean age was 7.69 ± 2.46 (mean$\pm$ SD). The dental arch relationship was assessed using modified Huddart Bodenham index (mHB) by two raters. Kappa statistics was used to evaluate the intra- and inter-examiner agreements, chi square was used to assess the associations and logistic regression analysis was used to explore the responsible factors that affect DAR. **Results:** The total mHB score [mean (SD)] was -8.261(7.115). Intra- and inter-agreement was very good. Using crude and stepwise backward regression analysis, significant association was found between positive history of class III ($P = 0.025$, $P = 0.030$ respectively) and unfavorable DAR. Using chi square test, complete UCLP ($P = 0.003$) and V-Y pushback palatoplasty ($P = 0.005$) were also significantly correlated with unfavorable DAR. **Conclusion:** This multivariate study suggested both phenotype (complete UCLP and positive history of class III) and postnatal (palatoplasty) factors had significantly unfavorable effect on the DAR.

Psychological Profile and Oral Health Related Quality of Life among Chronic Periodontitis Patients in UKM

<u>FARAH WH</u>[1] , VICTOR G[2], BADIAH B[3], TANTI IR[4]

[1]Department of Periodontology, Faculty of Dentistry, Universiti Kebangsaan Malaysia, [2]Department of Dental Public Health, Faculty of Dentistry, University Kebangsaan Malaysia.

Email: farah_waheeda@yahoo.com ; drvictorgoh@ukm.edu.my

Introduction: Psychological distress has been identified as one of the possible risk factor of periodontal disease. Studies have reported that those with psychological distress are resistant towards periodontal therapy. In the other hand, periodontal diseases may have an impact toward individual psychological and physical oral health related quality of life (OHQoL). A clinical research reported that patients with more severe forms of the disease had a tendency to have lower OHQoL. Until now, there is a lack of available data in Malaysia concerning the above issues. Possibility of association between psychological profile and OHQoL of such patients has yet not been reported. **Objectives**: The objectives of this study are 1) To evaluate the psychological profile by using Depression, anxiety and stress scale (DASS-21) and oral health related quality of life (OHQoL) by using Oral Health Impact Profile (OHIP-14) among Malay chronic periodontitis patients. 2) To identify the association between psychological profile and OHQoL with chronic periodontitis in term of clinical periodontal parameters. 3) To determine the possible relationship between psychological profile and OHQoL in chronic periodontitis patients. **Methods**: This study will be a descriptive cross-sectional study. New chronic periodontitis patients, of Malay ethnicity, attending the Periodontic clinic in UKM will be invited to participate. Patient's background and demographic information's will be documented. Consented subjects have to answer two main components of questionnaire which consists of DASS-21 and OHIP-14 prior to a full periodontal clinical examination. All the clinical periodontal parameters such as probing pocket depth, clinical attachment level, recession and bleeding on probing will recorded.

An Insight to OHRQoL and Periodontal Disease

[1]**SAM JIA XIAN,** [1]**LIM WAI SHEN,** [1]**KOH WEI ZHI,** [2]**PADMINI HARI**

[1]Faculty of Dentistry, MAHSA University;[2]Department of Periodontology, Faculty of Dentistry, MAHSA University.

Email: dr.haripadmini@gmail.com

Introduction: Periodontal disease being a public health concern worldwide not merely affects the oral health but also the overall health status and quality of life. **Objectives:** 1. To assess the awareness of periodontal disease in periodontitis patients 2. To assess the oral health related quality of life in periodontitis patients before and after periodontal therapy. 3.To correlate the OHRQoL scores with the periodontal disease parameters. **Methodology**: Thirty periodontitis patients from out patient clinic, Faculty of Dentistry, MAHSA University, who fulfilled the inclusion and exclusion criteria were selected.Socio demographic data was recorded and questionnaire about both the awareness and Oral Health Impact Profile (OHIP-14 M/C) was given to the patients followed by initial therapy. Comprehensive periodontal charting was recorded and non surgical periodontal therapy was performed. Periodontal parameters and OHIP scores were reassessed after 4-6 weeks. **Results:** Before treatment, Psychological discomfort and Physical disability were reported to have higher OHRQoL impact**.** OHRQoL scores showed a highly significant improvement in all the 30 patients after periodontal therapy. However, the OHRQoL scores were not correlated with Mean CAL and Sites with PPD$\geq$5mm parameters. **Conclusion**: Periodontal disease has an adverse impact on overall quality of life which is significantly improved with nonsurgical periodontal therapy.But the Quality of life scores obtained were not correlating with the disease severity parameters.This could be explained based on lack of awareness and attitude of the patients. Periodontal disease still remains a SILENT KILLER.

An In Vitro Comparison of Bond Strength of Different Sealers/Obturation Systems to Root Dentin Using Push Out Test

YAP WY[1], ZETI ADURA CAA[1], NOOR HAYATI A[1].

[1] Department of Conservative (Restorative), Faculty of Dentistry, University of Malaya

Email: wying1128@hotmail.com, zetiaziz@um.edu.my, hayatiazami@gmail.com.

Three-dimensional obturation is important for successful endodontic treatment. There are various sealers available in the market and the newer products promote 'monobloc' obturation system. **Objectives:** The objective of this study was to evaluate the bond strength of different sealers/obturation systems; TotalFill BC obturation system(FKG), TotalFill sealer with gutta-percha, EndoREZ obturation system(Ultradent) and EndoRez sealer with GP to intraradicular dentine at 2 weeks and 3 months post obturation compared to GP/AH Plus. **Methodology:** Sixty single-canal anterior teeth were prepared and assigned to experimental groups, designated as Group 1: Gutta-percha/AH Plus, Group 2: TotalFill BC point/BC sealer, Group 3: gutta-percha/TotalFill BC sealer, Group 4: EndoREZ point/EndoREZ sealer and Group 5: gutta-percha/EndoREZ sealer. After obturation, 6 teeth in each group was sectioned to 2-3 root slices of 2mm thickness and prepared for push-out assessment using universal testing machine at 2 weeks post obturation and another 6 teeth was assessed after 3 months post obturation. **Results:** Analysis using repeated measures ANOVA showed ddifference of mean between groups for 2 weeks post obturation regardless of location was significant ($p < 0.05$). The mean push-out bond strength of group 4 was significantly lower than group 1, 2 and 3. The mean push out bond strength of group 5 was significantly lower than group 1, 2 and 3. An independent t-test showed Group 2 and 3 had higher mean push out bond strength at 3 months compare to 2 weeks post obturation. For group 4 and 5, the mean push out bond strength 3 months was significantly lower than 2 weeks post obturation. Stereomicroscopic examination revealed that most of the samples showed mixed failure. **Conclusions:** TotalFill BC obturation system/TotalFill BC sealer showed comparable bond strength to AH Plus which had increased with time whereas EndoRez obturation system/EndoRez sealer had a poor push-out bond strength which decreased with time.

Flexural Strength of Denture Base Resin Reinforced With Microcrystalline Cellulose of Oil Palm Empty Fruit Bunch

AMIRA ALI ABDEL RAHAMAN[1] , JACOB JOHN[1], HESHAM EL-SEEDI[2]

[1]Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya; [2]Department of Chemistry, Faculty of Science, University of Malaya

Email: amira19_sm@hotmail.com; drjacob@um.edu.my

Objectives: The objective of this study was to assess the impact of reinforcing denture base resin with microcrystalline cellulose (MCC) of oil palm empty fruit bunch (OPEFB) on its flexural properties. **Methods:** The flexural strength and flexural modulus of three MCC-OPEFB reinforced PMMA were compared with a conventional and a commercially available PMMA. The 3 test groups were represented by addition of MCC-OPEFB by 2%, 2% (but equal amount of PMMA powder was reduced) and 5% respectively (but equal amount of PMMA powder was reduced). **Results**: All three test specimens demonstrated improved flexural strength and flexural modulus compared to the conventional resin. PMMA reinforced with 5% MCC-OPEFB showed statistically significant highest mean flexural strength followed by 2% MCC-OPEFB when compared to the conventional PMMA used in this study. **Conclusion**: The noteworthy improvement in flexural quality of a denture base acrylic material utilizing MCC-OPEFB is a significant finding for the advanced application of natural fibres in the field of dentistry. Microcrystalline cellulose of oil palm empty fruit bunch can be considered as a viable alternative to presently commercially available synthetic reinforced PMMA resin.

Role of IL-17E in Periodontal Disease

AWANG RA[1], LAPPIN DF[2], NILE CJ[2]

[1]School of Dental Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia.
[2]Infection and Immunity Research Group, Glasgow Dental School, School of Medicine, College of Medical, Veterinary and Life Sciences, University of Glasgow, UK

Email: rjazman@usm.my, David.Lappin@glasgow.ac.uk, Christopher.Nile@glasgow.ac.uk

Objectives: IL-17E (IL-25) has a key role in promoting Th2-driven pathologies but has also been demonstrated to down regulate destructive localised inflammatory responses in conditions such as rheumatoid arthritis. At present the role of IL-17E pathogenesis of periodontal disease is completely unknown. Therefore, the purpose of this study was to investigate the expression of IL-17E within the periodontoium and begin to delineate the role IL-17E may play in the pathogenesis of periodontal disease. **Methods**: Real time PCR was employed to compare the expression of IL-17E mRNA in healthy and diseased periodontal tissue. The cell types within the periodontium responsible for expression of IL-17E and its receptors (IL-17RA and IL-17RB) were then determined by immunohistochemistry. Using a live biofilm of the periodontal pathogen, *P. gingivalis*, combined with ELISA technologies and real time PCR, the ability of IL-17E to modulate the oral keratinocyte immune response was then investigated *in vitro*. **Results:** Real time PCR analysis showed that IL-17E mRNA levels are up-regulated in periodontal disease. Immunohistochemical analysis of diseased periodontal tissue demonstrated the cellular sources of IL-17E to be endothelial cells and infiltrating leukocytes. No expression of IL-17E was detected in oral keratinocytes. However, oral keratinocytes were demonstrated to express both IL-17RA and IL-17RB and therefore identified as a target for IL-17E signaling. Indeed, using an *in vitro P. gingivalis* biofilm model, IL-17E was found to negatively regulate the *P. gingivalis* induced expression of neutrophil pro-chemotatic chemokines; CXCL5 (ENA-78) and CXCL8 (IL-8). **Conclusions**: IL-17E can down regulate the expression of key neutrophil chemo-attractants and therefore possibly inhibit neutrophil chemotaxis into the periodontium. As neutrophils play a key role in the early events associated with periodontal disease progression, the data suggests IL-17E is a rational target for therapeutic intervention.

Antibacterial Activity of Olive Oil on *Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis* and *Fusobacterium nucleatum*: An In Vitro Study.

WAHIDATUNUR M[1], **NURULHUDA M**[1], **ZAMIRAH ZA, BADIAH B**[1]

[1]Department of Periodontology, Faculty of Dentistry, Universiti Kebangsaan Malaysia; [2]Department of Clinical Oral Biology, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: wahidatunur_82@yahoo.com, nurulhuda.mohd@ukm.edu.my

Introduction: Plant based product as an antimicrobial agent has received great attention since it is natural, biocompatible, cheap and easily available. World Health Organization (WHO) also encourages the use of natural substance for therapy since people have faith in such remedies. Recently, antimicrobial property of olive oil has been identified and used in many fields includes food industries, agriculture and health. The active ingredients in the olive oil that have been suggested to have antibacterial activity are Oleuropein and hydroxytyrosol (collectively known as phenolic compound). To date, scarce information or research available on antimicrobial activity of olive oil towards oral pathogen although research has found that both gram-positive and gram-negative bacteria are sensitive to the oil. **Objective**: The purpose of this study is to identify the potential of olive oil as an anti-bacterial agent towards three mostly associated periodontopathogen namely *Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis and Fusobacterium nucleatum.* **Methods**: Laboratory experiments will be carried out to determine the antibacterial activity of olive oil towards three periodontopathogen using minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC) and anti-adhesion activity crystal violet staining. Morphological changes of all bacteria will then be observed under scanning electron microscope (SEM). **Expected outcome**: Many studies have shown that olive oil has antibacterial activity towards pathogenic microorganism particularly gram-negative bacteria, thus it is expected that periodontal pathogen tested will also affected by olive oil.

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The Influence of Different Cements on The Bond Strength of Glass Fiber Post Under Different Barometric Pressure

NAJIB MR[1] , HO TK[2], NATASYA AT[2]

[1]Department of Operative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia; [2]Department of Prosthodontic, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: najibmr2258@gmail.com; tingkhee.ho@ukm.edu.my; drtasyatarib@ukm.edu.my

Objectives: The objective of this experimental laboratory study was to determine the interaction effect between different cements and different barometric conditions to the bond strength of glass fiber post. **Methods**: 40 extracted, single-rooted lower premolars are going to be endodontically treated (canals will receive endodontic treatment with standardizing the length). They will be randomly divided into 2 groups according to the cements used to the fiber posts (RelyX Fiber Post): Self-adhesive resin cement (RelyX™ Unicem 2 – 3M ESPE) and Resin modify glass ionomer cement (RelyX Luting 2 – 3M ESPE). Each group will be randomly divided into two equal subgroups which are control (normal atmospheric pressure) and hyperbaric condition (higher than normal atmospheric pressure). After 48 hours, the dowels will be tested using a universal testing machine for bond strength testing with pull out test. Data will be statistically analyzed using the two-way ANOVA. **Expected Results**: The bond strength of glass fiber post may be significantly affected by the types of cement and barometric pressure condition. Resin cement may have significantly higher bond strength compared with the resin modified glass ionomer cement.

Nanoleakage Expression of Strong Self-Etching Adhesive Systems: An Ultrastructural Study

MOHD HAIDIL AKMAL M[1,3], FOXTON RM[2], TAGAMI J[3]

[1]Department of Dental Materials, Kulliyyah of Dentistry, International Islamic University Malaysia; [2]Department of Restorative Dentistry, Kings College London; [3]Department of Cariology & Operative Dentistry, Tokyo Medical & Dental University.

Email: hamen135@yahoo.com

Objectives: to evaluate the nanoleakage expression and smear layer characteristics of two strong self-etching adhesive systems. **Methods**: Flat dentine surfaces were obtained from twelve extracted human molars. Smear layers were created by grinding with #180-grit and #600-grit SiC paper. Two strong self-etching adhesives Xeno V (pH 1.3) and G Bond Plus (pH1.5) and one mild self-etch system (Tri-S Bond,pH 2.7) were applied to the prepared surfaces . Dentine bond strengths were determined using microtensile bond test (μTBS). Data were analyzed using one-way ANOVA followed by post-hoc Tukey test. For nanoleakage evaluation, an additional twelve human molars were prepared similar to that of μTBS test procedures. All bonded slabs were fixed in fixative solution and placed in ammoniacal nitrate solution for 24 hrs in total darkness. After silver staining, the slabs were rinsed and placed in photo-developing solution for 8 hrs under fluorescence light. The slabs were then polished thoroughly using Sic papers up to #2000.-SiC and diamond paste to ¼ µm particle size. They were placed in acrylic resin ring and gold sputtered before being observed under a scanning electron microscope (SEM). **Results:** Rough smear layer preparation negatively affected the μTBS of all adhesive systems, but they were no significant differences. After treatment with XV and GB the smear layers and plugs were almost completely dissolved and removed, opening the dentinal tubules in both #600-grit and180-grit paper group .However, in Tri-S bond, the smear layers were mostly remained. Regarding nanoleakage, there were distinct increased of silver uptake observed in the strong self-etch groups compared to the mild type. In addition, spotted pattern type nanoleakage were largely present in most of the cases in all tested adhesives **Conclusions**: A rough prepared smear layer may lead to increased nanoleakage formation in strong and mild self-etching adhesive systems and negatively affected the bond strength.

The Effect of *Orthosiphon stamineus, Syzygium aromaticum* and *Zingiber officinale Roscoe* On Dentin Microhardness and Smear Layer Removal

SITI KHADIJAH MZ[1], JASMINA QZ[1], SHAHIDA MS[2], SAFURA B[1], YEW HZ[1]

[1]Department of Operative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia,
[2]Department of Periodontology, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: ctkhadijah.mz@gmail.com, jasmina@ukm.edu.my, shahida@dental.ukm.my
safurabaharin@ukm.edu.my, hsuzenn81@yahoo.com

Introduction: Natural products have become more popular in the modern day dentistry because of advantages like lesser adverse effects, economical, improved patient tolerance and renewable nature. Constant increase in antibiotic resistance and side effects caused by synthetic endodontic irrigants has shifted studies towards emergence of herbal alternatives. **Objectives**: The objectives of this *in-vivo* study was to examine the effect of *Orthosiphon stamineus* (cat's whiskers), *Syzygium aromaticum* (clove) and *Zingiber officinale roscoe* (ginger) on dentin microhardness and smear layer removal. **Methods**: A total of 90 human, lower premolar roots will be equally divided into two halves to measure dentin microhardness and to evaluate the amount of smear layer. A hundred and eighty root halves will be divided into six equal groups with 30 samples each according to the final irrigants used: Group 1: 2.5% sodium hyphochlorite, Group 2: 17% ethylenediamine tetraacetic acid (EDTA), Group 3: 0.9% normal saline, Group 4: 5mg/ml *Zingiber officinale roscoe* essential oil, *Group 5:* 0.5mg/ml *Syzygium aromaticum* essential oil, Group 6: 25mg/ml *Orthosiphon stamineus* essential oil. Fifteen root halves from each group will be prepared to measure dentin microhardness at baseline measurement and post-immersion in the irrigants to determine the change in microhardness, while the remaining fifteen root halves will be prepared for scanning electron microscope (SEM) to analyse the amount of smear layer in its coronal, middle and apical thirds. Data analysis is by using paired T-test and split-plot ANOVA. **Expected results:** 17% ethylenediamine tetraacetic acid (EDTA) and 2.5% sodium hypochlorite may show the greatest reduction in dentin microhardness compared to the herbal irrigants. EDTA may remove smear layer efficiently in the coronal and middle thirds of root canal. The three herbal plant essential oils may be ineffective in removal of smear layer when used independently and may not significantly reduce dentin microhardness.

Development of An Innovative Soft-Palatal Gauge and Testing Clinical Accuracy – New Dimension to Clinical Prosthodontics

PRASHANTI EACHEMPATI [1], KIRAN KUMAR K S[2], HTOO HTOO KYAW SOE[3]

[1]Department of Prosthodontics, Faculty of Dentistry, Melaka Manipal Medical College, Malaysia; [2]Department of Prosthodontics, Faculty of Dentistry, Melaka Manipal Medical College Malaysia, [3]Faculty of Medicine, Melaka Manipal Medical College, Malaysia

Email: prashanti.eachempati@manipal.edu.my

Introduction: Determining soft palatal angulation is an important aspect of establishing an appropriate posterior palatal seal. Based on the angle that soft palate makes with the hard palate, three configurations have been recognized using arbitrary method of visual inspection. Due to its subjective nature, it is very difficult for students and sometimes clinicians to accurately predict the angulation. Till date, there has been no objective clinical method for determining the angulation. The purpose of our research is to develop a new instrument for measuring soft palatal angulation and to test its clinical accuracy. **Objectives**: 1. Development of a soft palatal gauge which allows objective assessment of soft palatal angulation. 2. Test the accuracy of the instrument by comparing it clinically and radiographically. Methodology: A soft palatal gauge which is easily sterilizable and allows accurate measurement of soft palate angulation was designed and fabricated in metal using a novel technique. 50 volunteers whose lateral cephalograms were available in the archives were selected and soft palatal angulation was measured independently and in duplicate by three examiners who were blinded to the study participants, using three different methods (Palatal gauge, clinical examination, Lateral cephalometric tracing). **Results**: Pearson's correlation between lateral cephalogram and soft palatal guage was 0.994 indicating a very high correlation. McNemar test revealed a significant difference ($P < 0.05$) between the classification obtained with clinical perspective and lateral cephalogram tracings. There was no significant difference between the classification obtained from soft palatal guage and lateral cephalogram. **Conclusion**: The soft palatal gauge adds a new dimension to the changing prosthodontic paradigm and may be of immense use to the clinician as it provides an objective assessment of the soft palate angulation. Further studies are planned to explore the clinical implications in complete denture & maxillofacial prosthetics and sleep apnea patients.

Proteomics Changes During Bone Remodelling Induced by Implant-retained Overdentures

NAPI A.M.N.[1], AHMAD R.[1,2], TAN S.K. [3],KARSANI S. [4], IDORUS M.Y.[5], MAZLAN M.[6]

[1]Faculty of Dentistry, Universiti Teknologi MARA; [2]Unit of Prosthodontics, Faculty of Dentistry, Universiti Teknologi MARA; [3]Centre of Oral & Maxillofacial Surgery Studies, Faculty of Dentistry, Universiti Teknologi MARA; [4]Institute of Biological Science, Faculty of Science, University of Malaya, Kuala Lumpur; [5]Institute of Medical Molecular Biotechnology, Faculty of Medicine, Universiti Teknologi MARA; [6]Department of Biochemistry, Faculty of Medicine, Universiti Teknologi MARA

Email: aiiniiin91@gmail.com; drrohana@salam.uitm.edu.my

Implant-retained overdentures (IRO) have been successful in providing satisfactory treatment for edentulous patients but in most cases, they contribute to bone resorption. The pressure induced by the IRO on the soft tissue mucosa may have mediated proteomics changes that lead to this bone resorption. **Objectives**: The objective of this study is to identify the proteomics changes associated with bone remodeling induced by IRO. **Methods**: Saliva and soft tissue specimens from the alveolar ridge are collected from IRO patients. The protein changes will be detected by 2D Gel Electrophoresis and validated by Mass Spectrophotometry. The protein expression will then be correlated with bone resorption quantified by three-dimensional imaging. The discovery of proteomic changes in IRO wearers may reveal potential outcomes of explaining the phenomenon of alveolar bone loss and make the identification of high risk patients in developing severe bone resorption possible. Personalized treatment may be initiated and will improve the efficiency of dental treatment in prosthodontics for edentulous patients.

Influence of the Silica Protective Shells on the Chemical, Thermal and Mechanical Characteristics of Hydroxyapatite-Titanium Bio-composites

HALIM N.F.A[1], DABBAGH A.[1,2*], ABDULMUNEM M.[1], NADERI S.[1,2], ZADEH M.T[1], ABDULLAH H.[1], ABU KASIM N.H[1]

[1]Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, 50603 Kuala Lumpur, Malaysia; [2]Centre of Advanced Manufacturing and Materials Processing, Faculty of Engineering, University of Malaya, 50603, Kuala Lumpur, Malaysia.

Email: farhahalim88@gmail.com; hadijaha@um.edu.my; dabbagh_ali20013@yahoo.com; mohamadjasem@yahoo.com; sadjad_naderi@yahoo.com; mahtabtalaeizadeh@yahoo.com; nhayaty@um.edu.my

Introduction: A combination of hydroxyapatite (HA) bioactivity and Titanium (Ti) strength could result in promising bio-composites for load-bearing application. However, the mechanical properties of these composites are negatively affected by formation of fragile compounds during sintering. **Objective:** To investigate the effect of silica protective layer around the Ti particles on the intensity of metallic-ceramic interactions in HA-Ti composites at the sintering temperatures. It was assumed that the formation of silica interlayer could reduce the undesired chemical reactions at elevated temperatures and improve the chemomechanical characteristics. **Methods:** The Ti particles were firstly coated by a silica shell via a simple chemical method. The silica-coated Ti particles (STPs) were then mixed with HA and sintered to obtain the bio-composites. The morphological, chemical, and mechanical properties of the composite were characterized by the optical and scanning electron microscopes, X-ray diffractometry (XRD), Fourier transform infrared spectroscopy (FTIR), energy dispersive X-ray spectroscopy (EDX), and micro-hardness tester. **Results:** Both HA decomposition and Ti oxidation reactions were observed in the sintered composites. However, the silica interlayer could minimize the undesired HA-Ti interactions, causing complete removal of calcium titanate and titanium phosphides and even formation of stable calcium phosphates. Consequently, composites containing identical HA and STP weight ratios exhibited a relative high Vickers' hardness than Ti-HA composites with a weight ratio of 3:1. **Conclusion:** Surface modification of Ti particles using a silica layer could significantly improve the mechanical properties of the HA-Ti composites by increasing their thermal stability during the sintering process.

Oral Health Knowledge, Attitudes and Behavior Among 11-12 Year Old Indigenous Children in Cameron Highland, Malaysia

SAMOSIR R, Z.Y.M. YUSOF, HIMAZIAN M

[1] Department of Restorative Dentistry Faculty of Dentistry, University of Malaya [2] Department of Community Dentistry, University of Malaya

Email: rianti.samosir@yahoo.com ; himazian@um.edu.my ; zamros@um.edu.my

Objective: The aim of this study was to assess the oral health knowledge, attitudes and behavior of 11 - 12 year old Orang Asli children in Cameron Highland district, Malaysia. **Methods:** This was a cross-sectional study using a self-filled questionnaire targeting all Orang Asli primary school children in Cameron Highland, Pahang. There were 4 schools altogether and sample size was 227. Inclusion criteria were Year 5-6 (11-12 year olds) Orang Asli children who could read and write. The questionnaire was developed and validated for use in this study. Data collection was conducted in a class room setting. Ethics approval was granted by the Medical Ethics committee, Faculty of Dentistry. Permission to conduct the study was obtained from the relevant authorities, head teachers and parents of schoolchildren. **Results:** Overall, 227 out of 250 responded with 90.8% response rate. Fewer students (45.4%) did not agree that high sugary intake can cause dental caries while 20.3% was unsure. About two-thirds (67%) believed they should brush their teeth at least twice daily. About two-fifths (41%) disagreed that bleeding gum is the sign of periodontal disease, while 47.1% disagreed that plaque can cause periodontal disease. About half (49.3%) agreed chewing betel quid can freshen the mouth, while 41% disagreed that chewing betel nut is a habit that should be avoided. Less than two-thirds (55.1%) brushed their teeth twice a day. Majority (89%) consumed sugary drinks daily, chewed betel quid (83.3%) with 67.4% chewed on daily basis. **Conclusion:** This study showed that Orang Asli school children in Cameron Highlands had poor oral health knowledge, attitudes and related behavior on oral health. A comprehensive oral health education program at school is recommended to improve these parameters and promote oral health.

Shear Bond Strength of Five Adhesives to Dentine

AZIZAH MS[1] , NOOR AZLIN Y[1]

[1] Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya

Email: azizahmurtuzahshekh@gmail.com; nazlin@um.edu.my

Objectives: To evaluate the shear bond strength (SBS) of different adhesives and identify the failure mode at resin-dentine bonded interface. **Methods**: A total of 75 sound premolar teeth were selected and randomly assigned to five different groups (n=15). The groups were: OptiBond Solo (OS, total-etch), Optibond Versa (OV, two-bottles, self-etch), Adhe SE Ivoclar (ADHE, two-bottles, self-etch), G-Bond (GB, one-bottle, self-etch), and Optibond All in One (OBO, one-bottle, self-etch).The teeth were mounted in epoxy resin and the occlusal surface of the crowns were abraded to expose a flat dentine surface. Composite resin cylinder (4 mm diameter x 2 mm high) was build up on the occlusal surface of the tooth using a custom made mould. The specimens were subjected to 500 thermal cycles between 5° and 55° C and dwell time of 10 s. The SBS was tested using a universal testing machine at a crosshead speed of 0.5 mm/min. Data were statistically analyzed by one-way ANOVA and Post Hoc Test (Dunnett T3) multiple comparison test at 95% confidence level. Failure mode was determined as adhesive, cohesive or combination of both using stereomicroscope and the data were analyzed using Fisher's exact test. **Results:** The total-etch adhesive system, OS, had significantly higher values of SBS than the two self-etch adhesive systems (ADHE and GB). Within the self-etch systems, OV showed significantly higher values of SBS than ADHE and GB. However, there were no statistically significant differences between types of failure mode (P=0.40) and adhesive group. **Conclusions**: The average SBS value of total-etch system (OS) was higher compared to self-etch (GB) and (ADHE). Among the self-etch groups, OV showed the highest SBS. The difference compositions in the self-etch adhesive materials may contribute to the bond strength value. The failure modes detected within all tested groups did not show clinically important differences.

p53 Detection in Potentially Malignant Disorders and Oral Squamous Cell Carcinoma

NYI MAS SITI PURWANINGSIH[1], AHMAD TARMIDI SAILAN[1], SURAYA HANI MOHD SINON[2]

[1]Department of Clinical Oral Biology, Faculty of Dentistry, Universiti Kebangsaan Malaysia; [2]Department of Oral Pathology and Oral Medicine, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: nyimas.dds@gmail.com, sailan_at@yahoo.com, suraya6179@yahoo.com

Introduction: World Health Organization (WHO) stated on April 2011, oral cancer deaths in Malaysia reached 1587 cases or 1.55% of total deaths. Ninety-five percentage of oral cancer is classified as oral squamous cell carcinoma (OSCC). p53 are known as "guardian of the genome" since it plays very important role in preventing the tumour progression through apoptosis mechanism. **Objectives**: To detect p53 expressions in potentially malignant disorders (PMD) and OSCC using immunohistochemistry (IHC). **Materials and Methods**: A total of 86 formalin-fixed paraffin embedded tissue were selected for OSCC cases (n=46), PMD (n=32) and normal oral mucosa (NOM) (n=8). The cases were retrieved from the archives of the Oral Pathology Laboratory, Faculty of Dentistry, UKM and Institute of Medical Research, Kuala Lumpur. The IHC staining was manually performed using p53 antibody (Ready to use, DAKO) following manufacturer's instruction and assessed qualitatively (positivity and staining intensity) between all groups. Positive and negative controls were used to validate the IHC run. All data were then analysed using SPSS version 22.0 and p values <0.05 were considered significant. **Results**: There are significant differences in p53 expression between NOM and OSCC ($p<0.01$) and between PMD and OSCC ($p<0.05$). **Conclusions:** p53expression were increased following the degree of malignancy. The finding suggests that p53 can be used as a tumour diagnostic marker.

Keywords: immunohistochemistry; OSCC; PMD; p53

Clinical Evaluation of Newly Developed Local Delivery Antibiotics in The Treatment of Chronic Periodontitis

<u>WIDOWATI WITJAKSONO</u>[1] , YUNITA DEWI ARDINI[2],MUNIRAH YAACOB[1]

[1]Department of Periodontics, Kulliyyah of Dentistry, Universiti Islam Antarabangsa Malaysia; [2]Department of Pediatric Dentistry, Kulliyyah of Dentistry, Universiti Islam Antarabangsa Malaysia

Email: drwidowati@iium.edu.my

Introduction: Periodontal disease is a chronic microbial infection that triggers inflammation-mediated loss of the periodontal ligament and alveolar bone that supports the teeth. Local delivery of antimicrobials has been considered to be a possible solution for treating and controlling localized form of periodontal disease. However, to obtain local delivery antibiotics for periodontal disease can take considerable time, costly, could not persist easily in the periodontal pocket and involve a small but traumatizing surgery for antibiotic delivery. **Objectives**: The objective of this clinical experimental study is to compare the clinical outcomes of two treatment modalities; scaling root planning (SRP) plus newly developed local delivery antibiotics and SRP+Tetracycline (TC) gel. **Methodology**: Chronic generalized periodontitis patients with pocket depth of 5 to 7 mm were selected in a split-mouth study design. Control sites received SRP alone, while experimental sites received SRP plus newly developed local delivery antibiotics or SRP + Tetracycline gels (imported). Plaque index (PI), gingival index (GI), Bleeding on Probing (BOP), probing pocket depth (PD) will be measured at 6 sites around each tooth however only the two sites with the deepest pocket depth (PDs), clinical attachment level (CALs), or both (from different teeth within the same quadrant) will be selected for the study. All patients will be treated with full mouth SRP. In the test site, newly developed local delivery antibiotics or TC gel will be administered subgingivally at base line, and 1,2 and 3 weeks after base line and then 3 and 6 months after a week. Clinical and Radiographic measurements will be monitored at baseline, 3 months and 6 months after a week

Question: Does our newly developed local antibiotics can be used as an adjunction in the therapy of chronic periodontitis patient? **Hypothesis:** Newly developed local antibiotics can treat chronic periodontitis patient better than conventional therapy alone.

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Clinical Pathway for Non-Surgical Management of Moderate and Severe Generalized Chronic Periodontitis

YOW HIAN O[1], TUTI N[2], SHAHIDA M[2]

[1]Department of Periodontology, Faculty of Dentistry, Universiti Kebangsaan Malaysia; [2]Deanery Management Office, Faculty of Dentistry, Universiti Kebangsaan Malaysia

Email: ooiyowhian@hotmail.com; tutinin@ukm.edu.my; shahidams@ukm.edu.my

Periodontitis is a chronic disease of the gingival and periodontal tissues and its prevalence had been on the rise year after year especially after year 2000 which was clearly stated in NOHSA 2010. Patients with chronic periodontitis have always presented in different severity ranging from mild to severe and clinicians are challenged daily with managing patients with periodontitis of varying extent and severity. Besides, there are wide range of treatment options from prescribing systemic antimicrobials or usage of laser in its treatment. The use of clinical pathways (CP) can reduce variation and has been proven to reduce the cost and time spent in hospitals while maintaining the provision of high quality services to patients. **Objectives**: The objective of this randomized controlled clinical trial is to develop, implement and evaluate the treatment outcome of clinical pathway on the non-surgical management of moderate and severe generalized chronic periodontitis. **Methods**: Phase I of this study involves the development of the clinical pathway (CP) via a series of expert panel discussions. Phase II is the implementation of the CP whereby treatment outcomes of non-surgical management of moderate and severe generalized chronic periodontitis patients using CPs will be compared with those providing usual care. **Conclusions**: Its product will have a direct application in clinical settings of university dental clinics, and potential expansion for use in Ministry of Health dental clinics. Clinical pathway (CP) would benefit decision making and at the same time provide a range of evidence-based treatment care pathways that can reduce the duration required for the non-surgical management of moderate and severe generalized chronic periodontitis patient, at the same time increase its treatment outcome and quality of care.

An In-Vitro Comparative Study of Anti-*Streptococcus mutans* Effects of Coconut and Olive Oil

HALIMAH MN[1], SHAHIDA MS[2], ALIDA M[1]

[1]Department of Operative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia;
[2]Department of Periodontology, Faculty of Dentistry, University Kebangsaan Malaysia.

Email: halimah.mohamednoor@gmail.com; alida@ukm.edu.my

Introduction: High dental caries prevalence among young children, aged 6 year old and below, has become a major health problem in many countries. In Malaysia, dental caries in children in 2005 aged 6 year olds was 74.5%, and 76.2% in children aged 5 year olds. Thus, many intervention were done by researcher included, investigating the inhibition effect of natural product on a caries progression. **Objectives**: The objective of this experimental study was to determine the antibacterial effects of natural product; coconut and olive oil towards *Streptococcus mutans,* which is among the most cariogenic bacteria. **Methods**: An inoculum of *Streptococcus mutans* was exposed to a serial diluted coconut oil, and olive oil. Whereas, chlorhexidine was the control. Prior to the test, both oil were mixed with solvent; dimethyl sulfoxide (DMSO), as to ensure the oils mixed be water based diluent. The serial dilution was performed as to get a Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) of the coconut and olive oil. Every test was done three times with triplicate plate and read under a microplate reader. The result was compared and identified which oil has more antibacterial effects towards *Streptococcus mutans.* **Results:** With a triplicate test times three, for both oil, gave a results of significant inhibition of *Streptococcus mutans* by olive oil at MIC of 12.5% and also the MBC. However, there is no significant different of bacterial inhibition by the control. Whereas, coconut oil only showed a significant inhibition at 100% concentration. **Conclusions**: Olive oil with 12.5% concentration appears to be cut off point of anti-*Streptococcus mutans* effects. Olive oil is a natural product and was approved that it not cause any harm on a young children's mucosa even in prolonged used, compared to chlorhexidine which was not recommended in children.

The Effect of Dissociation Reagents and Gravitational Force on Viability and Pluripotency of Deciduous Dental Pulp

NIK NURHANNAN MB[1], WIJENTHIRAN K[1], SABRI M[1]

[1]Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Email: niknurhannan@yahoo.com ; wijenthiran@yahoo.com.sg ; sabrim@um.edu.my

Objectives: The objective of this study is to investigate the effect of different dissociation reagents and gravitational force on viability and pluripotency of deciduous dental pulp stem cells (SHED). **Methods**: Dental pulp stem cells from deciduous teeth (SHED) will be subcultured in 6-well plates and T-25 flasks in the laboratory until few passages. Four different types of dissociation reagents, which include Trypsin, TrypLE, Accutase and Dispase will be used to detach the stem cells from culture flask. Then SHED will be centrifuged under different gravitational force. Cells viability will be assessed with MTT assay. It will be followed by RNA extraction and pluripotent characterisation with real time polymerase chain reaction (PCR). **Results**: Some positive or negative effects might be expected on the viability and pluripotency of SHED by using different reagents and different gravitational force. **Discussion**: By means of tissue engineering, SHED need to be exploited to generate more cellular material for tissue repair. To date, there is no standard expansion protocol for SHED has been established in the literature. In view of the potential application of SHED for clinical medicine, there is growing interest in the optimizing the expansion protocols so as large quantities of cells can be produced for therapeutic application which is cost effective and at the same time to maintain their functional capabilities. **Conclusion**: In this study, we are trying to compare and to determine which dissociation reagent and centrifugal force will produce the largest number of SHED within limited time and minimal cost to serve for better cellular therapy.

Cytotoxic Effect of Allicin and Ajoene on Oral Squamous Cell Carcinoma

BAHIJAH MZ[1], NUR FATIHAH S[1], VIVI NORYATI A[1], INDAH MA[1]

[1]Center of Preclinical Science, Faculty of Dentistry, Universiti Teknologi MARA Malaysia.

Email: bahijahzubir@yahoo.com; vivi_noryati@salam.uitm.edu.my

Objectives: The objective of this study is to investigate the cytotoxic effect of Allicin and Ajoene on oral squamous cell carcinoma. **Methods**: Human oral squamous cell carcinoma cell SCC090 cells will be cultured in Eagle's Minimum Essential Medium in standard experimental condition. The cytotoxic effect of Allicin and Ajoene on SCC090 cells will be determined using WST-1 Proliferation Kit. Simultaneously, morphology of viable and death cells before and after treatment will be monitored and observed under an inverted light microscope at 100X and 200 X magnifications. A final concentration (0 to 150μM) of Allicin and Ajoene will be used for treatment and maximum incubation was set up to 72 hours. The IC_{50} (concentration which inhibits the proliferation of 50% of tested cells) will be determined from the proliferation assay. The experiment will be repeated three times independently and in triplicates. Trypan blue exclusion test will be carried out to validate the cytotoxicity assay. All data will be analysed using One- Way ANOVA with $p < 0.05$ and presented as means ±SD. **Results:** Based from other cytotoxicity studies in different type of cell lines, Allicin and Ajoene will show similar trends which will inhibits the proliferation of SCC090 cells in dose and time dependant manner. Morphology of visualized cells will show distinguish characteristics of viable and death cells upon treatment incubation. The trypan blue exclusion assay will show concordance results with the cytotoxicity study. **Conclusions**: These findings could be used as a basic rationale for anti-cancer study particularly in oral cancer management and widen the possibilities to extend the experimental at in-vivo setting.

The Effectiveness of *Ficus deltoidea* on Oral Ulcer – Animal Model

HASMARINI MA[1], AINA IZZATY MZ[1], VIVI NORYATI A[1], INDAH MA[1]

[1]Center of Preclinical Science, Faculty of Dentistry, UniversitiTeknologi MARA Malaysia.

Email: hasmariniasri92@gmail.com; vivi_noryati@salam.uitm.edu.my

Objective: The purpose of this study is to investigate the effectiveness of *Ficus deltoidea* (*F.deltoidea*) as anti-ulcer on animal models. **Methods:** Thirty males SD rats, weighing 180-250 g will be divided into two groups as experimental and control groups. The rats will be sedated with dose of 50 mg/kg of Nembutal through intra-peritoneal route; oral ulcer model will be made by applying 99.5% of glacial acetic acid- moistened paper disc on rat buccal mucosa. After 2 days later, this technique will generate an immediate tissue necrosis, which then produces a single crater form ulcer in each of the experimental rats. The ulcer normally will remain up to 14 days. In the experimental group, one drop of *F.deltoidea* extract will be applied twice daily onto the lesion.Three rats in each group will be sacrificed on days 2, 4, 6, 8 and 10 after induction and will be recorded as H2, H4, H6, H8 and H10 groups, respectively. The size of the ulcer will be measured and gross evaluation of lesions will be done. The tissue samples from buccal mucosa were processed for Hematoxylin Eosin (HE) staining, and then evaluated histologically.Data were analyzed statistically by Independent t-test with significant p-values of <0.05 (95%). **Results:** Based from other study in different type of ulcers such as peptic ulcer, *F.deltoidea* extract will show similar trends which will promotes ulcer protection. The size and the area of oral ulcer significantly becomes decrease and histologically it can accelerate re-epithelization of ulcer healing process. **Conclusions:** These findings suggest that *F.deltoidea* extract could be developed as therapeutic agent for oral ulcer.