Abstracts

Abstracts of Theses Approved for the MSc at the School of Dental Sciences, Universiti Sains Malaysia, Health Campus, Kubang Kerian, Kelantan, Malaysia

EFFECT OF CARBONATED BEVERAGE AND FLUORIDE MOUTH RINSES ON ENAMEL SURFACE AND SHEAR BOND STRENGTH OF CONVENTIONAL RESIN BASED ORTHODONTIC ADHESIVE COMPOSITE

Dr Abdelbasset Blqasim Al-Taib Slimani
MSc (Dentistry)

Paediatric Dentistry Unit
School of Dental Sciences, Universiti Sains Malaysia
Health Campus, 16150 Kelantan, Malaysia

Introduction: Carbonated beverages contains high amount of sugar and acids that can affect oral health negatively. There were some indications about the erosive effect of mouth rinses on enamel surface.

Objectives: This study was conducted to determine the long term consumption of carbonated beverage and the use of fluoride mouth rinses on enamel surface and shear bond strength of conventional resin based orthodontic adhesive composite.

Methods: An in-vitro study was done on 180 extracted human teeth. The brackets were bonded on the teeth with Transbond XT orthodontic adhesive. The teeth were divided randomly and equally into 6 groups. 25 days exposure cycles were done for all groups as following: group 1 control (distilled water), group 2 (Coca Cola), group 3 (Colgate mouth rinse), group 4 (Oral-B mouth rinse), group 5 (Coca Cola plus Colgate mouth rinse), and group 6 (Coca Cola plus Oral-B mouth rinse). Image analyzer was used and the percentage of enamel decalcification surface area was calculated. Universal test machine was used to determine the shear bond strength. Image analyzer was also used for calculating adhesive remnant index on enamel surface after debonding. Data were entered in PASW version 18 (SPSS Inc., Chicago, IL). Kruskal-Wallis and Mann-Whitney tests were used to compare the percentage of the enamel decalcification surface area between groups.

Result: It was found that all groups have enamel decalcification greater than control group with different degrees. One-way ANOVA test and Scheffe multiple comparisons test were used to compare significant differences of shear bond strength between study groups. There was significant difference between control group 1/group 2 (P = 0.001) and 5 (P = 0.047). There was no significant difference between group 1/group 3 (P = 0.983), 4 (P = 0.480), and 6 (P = 0.670). Moreover, Kruskal-Wallis and Mann Whitney tests were used to compare significant differences of adhesive remnant index among study groups. There was no significant difference among study groups.

Conclusion: This study concluded that the long period consumption of carbonated beverage caused enamel decalcification, reducing shear bond strength of the orthodontic adhesive, and cause debonding failure site at enamel-adhesive interface. The long use of acidic fluoride mouth rinses can cause enamel decalcification and debonding failure site at enamel-adhesive interface However, it will not affect the shear bond strength. The use of fluoride mouth rinses after carbonated beverage consumption has limited effect on shear bond strength except for Oral-B mouth rinse, enamel decalcification, and failure site.

Supervisor:
Assoc Prof Dr Normastura Abd Rahman

IN VITRO EVALUATION OF THE FERRULE EFFECT AND POST MATERIAL ON FAILURE LOAD AND MODE IN ENDODONTICALLY TREATED TEETH

Dr Mahmood Alayham Abbas
MSc (Dentistry)

Paediatric Dentistry Unit
School of Dental Sciences, Universiti Sains Malaysia
Health Campus, 16150 Kelantan, Malaysia

Introduction: There are still controversy regarding the ferrule effect and a better bonded pre-fabricated posts on strength of endodontically treated teeth.

Objectives: The aim of this study was to compare the effect of ferrule and 2 types of bonded post materials on failure load and failure mode of restored endodontically treated teeth.

Methods: 68 extracted maxillary central incisors were sectioned 15 ± 0.1 mm coronal to the root apex using hard tissue cutter (Exakt, DE) and high speed handpiece. Then, they were endodontically instrumented using step-back technique with master apical file size 45 and obturated with gutta-percha (Meta Dental Co. Ltd, KR) and sealed with AH 26 (Dentsply Maillefer, DE) using lateral condensation technique. Post spaces were then prepared using Gates-Glidden rotary instrument to remove gutta-percha leaving 5 mm from the apex, followed by Tenax drills (Coltene Whaledent, US) up to size 1.3 mm in diameter to enlarge the canals. Samples were randomly divided into 4 groups of 17 where group A was placed with titanium post (Tenax post, Coltene Whaledent, US) without ferrule preparation, group B placed with titanium post and 2 mm ferrule preparation, group C placed with glass fiber reinforced composite post (Tenax fiber white post, Coltene Whaledent, US) without ferrule preparation, and group D placed with glass fiber reinforced composite post and 2mm ferrule preparation. All posts were cemented using

www.mjms.usm.my

Panavia F (Kuraray Medical Inc., JP) before the core was built with Paracore (Coltene Whaledent, US) and standardise the size using paraform coreformer #1. Then, crowns fabricated using Ni-Cr where the length of each sample with the crown in place was 23 ± 0.1 mm, checked using a digital calliper. Crowns were cemented using Ketac-Cem (3M ESPE, DE). 4 metal blocks were used to hold the specimens during mechanical testing. Each block had a drilled cylindrical hole with a different diameter (5.5 mm, 6.5 mm, 7.5 mm, and 8.5 mm) to accommodate to different specimens' widths with rubber silicon impression material injected to simulate the periodontal ligament.

Result: A universal testing machine (Instron 3366, US) was used for the mechanical testing by applying a compressive load at a crosshead speed of 1 mm/min at an angle of 135° to the long axis of the sample until failure. The medians of failure load for groups A, B, C, and D were 253.10 N (76.6), 265.40 N (279.7), 203.10 N (68.7), and 251.75 N (69.2), respectively. Kruskal-Wallis test indicated that the medians of failure load were not statistically significant across the 4 groups ($P > 0.05$). Failure mode was classified as either favorable failure (failure of the restoration only) or unfavorable failure (failure of the restoration and the supporting tooth structure). Group C had the highest frequency of favorable failures (87.5% favorable and 12.5% unfavorable failures). Group A had (37.5% favorable and 62.5% unfavorable failures). Group B and D had (0% favorable and 100% unfavorable failures. Chi-square test for independence indicated a significant difference in failure mode between the groups ($P < 0.05$).

Conclusion: The ferrule effect and post material did not significantly affect the failure load of endodontically treated teeth, but those restored with glass fiber reinforced composite posts had a more favorable failure mode than those restored with titanium posts when the ferrule effect was not present.

Supervisors:
Dr Wan Zaripah Wan Bakar
Assoc Prof Dr Sam'an Malik Masudi

FABRICATION AND CHARACTERIZATION OF EXPERIMENTAL NANOCOMPOSITES FOR DENTAL RESTORATION

Dr Tuan Noraihan Azila Binti Tuan Rahim
MSc (Dentistry)

Paediatric Dentistry Unit
School of Dental Sciences, Universiti Sains Malaysia
Health Campus, 16150 Kelantan, Malaysia

Introduction: Currently, restorative dental composites have become preferred among patients due to their esthetic characteristic and also their durability. The high costs of composites, as well as the rising demand by patients have lead researchers to produce a local product with equivalent standard as compared to the commercially available dental composites. Recently, monodispersed, spherical silica nanofillers with a size range of 10–20 nm were successfully synthesised via a sol-gel process and have a great potential to be used in fabrication of dental composites.

Objectives: This present study was carried out to fabricate and characterize the experimental dental nanocomposite from the synthesised nanosilica fillers.

Methods: Dental composites, namely experimental nanocomposite 1 (ENC1) and experimental nanocomposite 2 (ENC2) with 2 different filler content, 30 and 35 wt% respectively were fabricated, molded, and polymerized with a light curing unit for 40 seconds. The properties that were tested including their flexural strength, modulus, compressive strength, micro hardness, degree of conversion, volumetric shrinkage, water sorption, solubility, surface roughness as well as filler distribution. The data obtained were statistically analysed with one-way ANOVA with the level of significance $P = 0.05$. Various type of commercial composites such as FiltekTM Z350 (nanocomposite), Spectrum® TPH®3 (microhybrid), Z100TM (hybrid), and Durafill® VS (microfilled) were chosen to compare their properties with the experimental nanocomposites. The properties of composites were also referred to the ISO and ANSI/ADA No. 27 requirements.

Result: From the results obtained, it can be summarised that the experimental nanocomposites and commercial composites comply with the ISO and ANSI/ADA No. 27 requirements. Similar properties can be found between experimental nanocomposites and Durafill® VS (microfilled composite) regarding their flexural strength, modulus, compressive strength, hardness, and also surface roughness. These properties are sufficient to be applied for the anterior restoration. However, the properties of the experimental nanocomposites were still inferior compared with the posterior restorative composites (FiltekTM Z350, Spectrum® TPH®3, and Z100TM) particularly in flexural strength, modulus, hardness, shrinkage, and water sorption. Comparing both of the experimental nanocomposites, ENC2 seems to have better properties compared with ENC1 except for the compressive strength.

Conclusion: Overall, the main factor that contributes to the properties of dental composites is inorganic fillers including their filler content, size, morphology, and distribution. Highly filled composites exhibited excellent properties than the composites with low filler content. The synthesised nanosilica might be an option to be used for making a dental composite. However, concerns also arise regarding dental composites problem of achieving the high filler loading, which limit their application only for making anterior composite.

Supervisor:
Dr Dasmawati Mohamad
Co-supervisor:
Assoc Prof Dr Hazizan Md Akil

Guideline For Authors

The MJMS welcomes manuscripts on all aspects of medicine/health science from any part of the world. We are members of World Association of Medical Editors (WAME) and Council of Science Editors (CSE).

Manuscripts must be submitted in English. Manuscripts are considered for publication in MJMS with the understanding that they have not been published or submitted for publication elsewhere. The manuscript should be submitted to the Editor, Professor Jafri Malin Abdullah via Manuscript Central http://mc.manuscriptcentral.com/maljms. Please note that at the moment, we do not accept Miscrosoft Word 2007 documents (*.docx). Please use Ms Word's "Save As" option to save your document as an older (.doc) file type The guidelines listed below are in accordance with the Uniform Requirement for Manuscripts Submitted to Biomedical Journals (October 2008 revision) of the International Committee of Medical Journal Editors.

Forms

When submitting manuscripts, authors are required to sign the Authorship Agreement Form, Patient Consent Form (if the manuscript includes identifiable patients) and the Publication Agreement Form.

Types of Manuscripts

MJMS publishes the following types of manuscripts.

Editorials (E): Brief, substantiated commentary on subjects of topical interest.
Abstracts: Not required
Text: Not more than 1200 words (excluding references and figure/table legends)
Tables and figures: Not more than 1
References: Not more than 20

Original Article (OA): Reports of original clinical or investigative laboratory research.
Abstract: Not more than 275 words
Text: Not more than 3500 words (excluding references and figure/table legends)

Review Article (RA): A review article aims to give an overview of a particular subject suitable for a wide audience. Review articles should be recent rather than a historical review of the article on the topic.
Abstract: Unstructured Abstract not more than 275 words
Text: Not more than 4500 words (excluding references and figure/table legends)
References: Not more than 80

Case Report (CR): Brief case reports of unusual interest.
Abstract: Unstructured abstract, not more than 175 words
Text: Not more than 2000 words
References: Not more than 10
Figures and tables: Less than 3 figures and tables

Brief Communications (BC): A Brief Communication is suitable for recording the results of complete small investigations or giving details of new models or hypotheses, innovative methods, techniques or apparatus.
Abstract: Not more than 175 words
Text: Not more than 1500 words
References: Less than 20
Figures and tables: Not more than 3

Special Communications (SC): These manuscripts describe an important issue in clinical medicine, public health, health policy, or medical research in a scholarly, thorough, well-referenced, systematic or evidence-based manner.
Abstract: A narrative (unstructured) abstract of 200 words or fewer is required
Text: Not more than 3000 words (excluding tables, figures, or reference
References: Less than 80

Letter to The Editor (LE): Comments on articles published within 6 months in MJMS or articles of interest to the biomedical community
Text: Should not exceed 500 words
References: Not more than 6 references

Letters in Reply (LR): Replies by authors
Text: should not exceed 500 words
References: Not more than 6

Extended Abstracts (EA): Only published as supplementary issues during conferences. Extended abstracts are also peer reviewed. Authors who intend to submit extended abstracts should contact directly via email at mjms.usm@gmail.com.

Ethical Requirements

In experiments on human subjects, authors should mention whether the methods followed were in agreement with the ethical standards of the responsible committee (institutional and national) and the Declaration of Helsinki (October 2008 revision). Similarly, the use of animals in research must conform to the institutional and national guidelines.