Abstract

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EFFECT OF REVERSE TWIN-BLOCK AND REVERSE PULL FACE MASK APPLIANCE FOR CLASS III MALOCCLUSION ON DENTO-FACIAL MORPHOLOGY IN MALAY POPULATION

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Introduction: The treatment effect of Reverse Twin-Block and Reverse Pull Face Mask definitely produces some changes in the dento-facial structures, including the soft tissue. There is a lack of available literature in the management of Class III malocclusion as well as treatment effects of these particular appliances in Malay population.

Objectives: This cross-sectional study was aimed to compare and analyse the craniofacial changes produced by Reverse Twin-Block and Reverse Pull Face Mask in early and late mixed dentition of Malay children having Class III malocclusion.

Materials and Methods: Data consisted of pre- and post-treatment lateral cephalograms of 95 mixed dentition Malay children, 49 children treated by Reverse Twin-Block and 46 children treated by Reverse Pull Face Mask were divided into early (8–9 years) and late (10–11 years) mixed dentition groups. Treatment changes were assessed by Holdaway's analysis, Ricketts analysis, Tweed's analysis, pharyngeal airway space analysis and Steiner's analysis using CASSOS and MITK software. Descriptive statistics and multiple linear regression were performed with the significance level set at 0.05.

Results: The result of the study revealed that the treatment effect of Reverse Twin-Block and Reverse Pull Face Mask has some statistically significant differences including gender disparities. However, these statistically significant changes were very minimal to notice clinically, except upper incisor proclination and upper lip protrusion. Reverse Pull Face Mask treated children had more proclined upper incisors and more protruded upper lip. The result also shows that different age group has no significant impact on the treatment effect.

Conclusion: Reverse Pull Face Mask produced better treatment outcome with more proclined upper incisor and more protruded upper lip than Reverse Twin-Block in mixed dentition Malay children with Class III malocclusion. The treatment of Class III malocclusion in Malay children can be delayed until late mixed dentition stage as no significant differences were noted in treatment effects of early and late mixed dentition groups. The treatment plan should be same for both male and female children as the gender disparities found are clinically unnoticeable.

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MEASUREMENT OF ORTHODONTIC BRACKET DEBONDING FORCE ON DIFFERENT TEETH USING A PROTOTYPE DEVICE EQUIPPED WITH FORCE SENSITIVE RESISTOR: AN IN-VITRO AND IN-VIVO STUDY

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Introduction: The consistency and success of expensive and laborious fixed orthodontic treatment relies much on the stability of bonding at the bracket-adhesive and as well as at the adhesive- tooth enamel interface. Therefore, orthodontic bonding studies should emphasise more on testing the effect of oral environment on the wide range of orthodontic bracket-adhesive systems that are evolving regularly.

Objective: The objective of this present study is to introduce a prototype device capable of debonding orthodontic brackets and measuring the peak debonding force clinically by a calibrated force sensor mechanism.

Materials and Methods: Ninety-nine maxillary premolar samples were prepared for the in-vitro studies. Standardised bonding protocol was maintained by a single clinician utilising 0.022 metallic brackets (HKS 3, Ortho Classic, McMinnville, USA), Transbond XT adhesive with Transbond Plus self-etching primer (3M Unitek, Monrovia, California, USA) and LED light curing (model-DB686, COXO, Guangdong, China) for 20. Sixty samples were divided equally into two groups for the validation study. For intra and inter-examiner reliability, 39 samples were equally divided into three groups. The brackets were debonded after 24 h of bonding. Clinically, orthodontic bracket debonding forces were measured on 260 different teeth in 13 patients

after comprehensive fixed orthodontic treatment and divided equally into 10 groups from the central incisor to second premolar. Following debonding procedure, intra-oral micro-photograph of each tooth was taken using portable digital microscope for assessing the bracket-failure pattern by 4-point scale of adhesive remnant index (ARI). Statistical analysis included independent samples t-test for validation study, intraclass correlation coefficient test for intra and inter-examiner reliability, one-way ANOVA to compare in-vivo mean debonding forces between different tooth groups and the non-parametric Kruskal-Wallis test to compare in-vivo ARI between different tooth types. The significance level was set at less than 0.05.

***Results**:* The mean debonding force between the universal testing machine (10.43± 2.71 N) and the prototype device (9.36 ± 1.65 N) was not significantly different (P = 0.072). The prototype device exhibited excellent intra and inter-examiner reliability (0.942 and 0.921). Significant difference (P < 0.001) of mean debonding force was found between different types of teeth in-vivo. Clinically, ARI scores were not significantly different (P = 0.921) between different groups but overall higher scores were predominant.

***Conclusion**:* The prototype device can be recommended for measuring clinical bracket debonding force as the device is validated, proved to be reliable and based on clinical ARI scoring caused less iatrogenic enamel damage. Bracket debonding force should be measured on same tooth from the same arch as significant difference of mean debonding force exists between similar teeth of the upper and lower arches.

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