

RESEARCH ABSTRACTS FROM ORTHODONTIC JOURNALS

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Comparative assessment of conventional and self-ligating appliances on the effect of mandibular intermolar distance in adolescent nonextraction patients: A single-center randomized controlled trial

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Introduction: Our aim in this study was to compare intermolar widths after alignment of crowded mandibular dental arches in nonextraction adolescent patients between conventional and self-ligating brackets.

Methods: Fifty patients were included in this randomized controlled trial according to the following inclusion criteria: nonextraction treatment in both arches, eruption of all mandibular teeth, no spaces in the mandibular arch, mandibular irregularity index from canine to canine greater than 2 mm, and no therapeutic intervention planned involving intermaxillary or other intraoral or extraoral appliances including elastics before the end of the observation period. The patients were randomized into 2 groups: the first received a conventional appliance, and the other a passive self-ligating appliance, both with a 0.022-in slot. The amount of crowding of the mandibular dentition at baseline was assessed by using the irregularity index. Intermolar width was investigated with statistical methods of linear regression analysis. On an exploratory basis, the effect of appliance type on intercanine width was also assessed. Additionally, the effects of appliance type on time to alignment and crowding on time to alignment were assessed by using the Cox proportional hazards model.

Results: No evidence of difference in intermolar width was found between the 2 bracket systems (b50.30; 95% CI, 0.3 to 0.9; P50.30). No evidence of difference in intercanine width was observed between the 2 bracket systems (b 5 0.33; 95% CI, -0.8 to 0.1; P 5 0.15). The time to reach alignment did not differ between appliance systems (hazard ratio, 0.68; 95% CI, 0.4 to 1.2; P 5 0.21), whereas the amount of crowding was a significant predictor of the required time to reach alignment (hazard ratio, 0.88; 95% CI, 0.8 to 0.9; P50.02).

Conclusions: The use of conventional or self-ligating brackets does not seem to be an important predictor of mandibular intermolar width in nonextraction patients when the same wire sequence is used.

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MI Paste Plus to prevent demineralization in orthodontic patients: A prospective randomized controlled trial

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Introduction: Enamel demineralization is a problem in orthodontics. Fluoride is partially effective in addressing this problem, but additional treatment options are needed. The objective of this prospective randomized controlled trial was to determine the effectiveness of a new product, MI Paste Plus (GC America, Alsip, Ill), in the prevention or reduction of white spot lesions in orthodontic patients.

Methods: Sixty patients who were undergoing routine orthodontic treatment were recruited for this prospective randomized clinical trial. A double-blind method of randomization was used to determine whether each patient received the MI Paste Plus or a placebo paste (Tom's of Maine, Salisbury, United Kingdom). Each patient was asked to administer the paste by using a fluoride tray for a minimum of 3 to 5 minutes each day at night after brushing. Photographic records obtained in a light-controlled environment were used to record the presence or absence of white spot lesions in both groups. The enamel decalcification index was used to determine the number of white spot lesions per surface at each time interval. Patients were followed at 4-week intervals for 3 months. A scoring system from 0 to 6 was used to determine the level of caries or cavitations. This system was also used for each tooth at each time interval.

Results: Fifty patients (26 using MI Paste Plus, 24 using the placebo paste) completed the study. The enamel decalcification index scores for all surfaces were 271 and 135 at the start of treatment and 126 and 258 at the end of treatment for the MI Paste Plus and placebo paste groups, respectively. The enamel decalcification index scores in the MI Paste Plus group reduced by 53.5%, whereas the placebo group increased by 91.1% during the study period. A 3-way analysis of variance (ANOVA) was done for the average enamel decalcification index scores. The surface type, the product/time interactions, and the product/surface interactions of the mean enamel decalcification index scores were significant (P<0.05).

Conclusions: MI Paste Plus helped prevent the development of new white spot lesions during orthodontic treatment and decreased the number of white spot lesions already present. The placebo paste had no preventive action on white spot development during orthodontic treatment; the number of lesions actually increased. MI Paste Plus reduced white spots on the gingival surfaces; the placebo paste had the opposite effect. The incisal surface effect on the mean enamel decalcification index scores over time and between products was highly significant. The incisal enamel decalcification index scores were consistently higher than those for the other surfaces (mesial, distal, and gingival).

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Effect of early Class II treatment on the incidence of incisor trauma.

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INTRODUCTION:

Many researchers have examined the prevalence of dental injuries in children and adolescents. The purpose of this study was to examine the prevalence and incidence of incisor trauma in subjects who participated in a randomized clinical trial designed to investigate early growth modifications in the treatment of Class II malocclusion.

METHODS:

The subjects were randomized to 3 treatment groups during the initial phase of the study: (1) headgear or biteplane, (2) bionator, and (3) observation (no treatment). All 3 groups underwent phase 2 treatment with fixed appliances. Incisor injury was scored at every data collection point with the Ellis index by a blinded examiner using dental casts, intraoral photos, and panoramic and periapical x-rays.

RESULTS:

Twenty-five percent of the subjects had incisor trauma at the baseline examination, and 28% experienced new or worsening maxillary incisor injury during the study. No significant differences were found with regard to sex and prevalence of injury at baseline. No differences in incidence of trauma were found between the 3 treatment groups throughout the study ($P = 0.19$); however, boys were more likely to experience maxillary incisor injury (odds ratio estimate, 2.37; 95% CI, 1.33, 4.21), and those with an injury at baseline were more likely to experience an additional injury (odds ratio estimate, 1.81; 95% CI, 1.03, 3.17).

CONCLUSIONS:

Early orthodontic treatment did not affect the incidence of incisor injury. The majority of the injuries before and during treatment were minor; therefore, the cost-benefit ratio of orthodontic treatment primarily to prevent incisor trauma is unfavorable.

Banding versus bonding of first permanent molars: a multi-centre randomized controlled trial.

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OBJECTIVE:

To assess the effectiveness of banding versus bonding of first permanent molars during fixed appliance treatment; in terms of attachment failure, patient discomfort and post-treatment enamel demineralization.

DESIGN:

Multi-centre randomized clinical trial. Setting: One District General Hospital Orthodontic Department and two Specialist Orthodontic Practices. Participants: Orthodontic patients aged between 10 and 18 years old, randomly allocated to either receive molar bands ($n=40$) or molar bonds ($n=40$). Method: Bands were cemented with a conventional glass ionomer cement and tubes were bonded with light-cured composite to all four first permanent molar teeth for each subject. Attachments were reviewed at each recall appointment to assess loosening or loss. The clinical end point of the trial was the day of appliance debond. Enamel demineralization at debond was assessed using the modified International Caries Assessment and Detection System (ICDAS).

RESULTS:

The first time failure rate for molar bonds was 18.4% and 2.6% for molar bands ($P=0.0002$). Survival analysis demonstrated molar bonds were more likely to fail compared with molar bands. First permanent molars with bonded tubes experienced more demineralization than those with cemented bands ($P=0.027$). There was no statistically significant difference in discomfort experienced by patients after banding or bonding first permanent molars ($P>0.05$).

CONCLUSION:

This study shows that as part of fixed appliance therapy, American Orthodontics photoetched first permanent molar bands cemented with 3M ESPE Ketac-Cem perform better than American

Orthodontics low profile photo-etched and mesh-based first permanent molar tubes bonded with 3M UnitekTransbond XT in terms of failure behaviour and molar enamel demineralization. J Orthod. 2011 Jun;38(2):81-9.

Treatment effects of the R-appliance and twin block in Class II division 1 malocclusion.

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Abstract

The purpose of this study was to compare the effects of a differently designed functional appliance (the R-appliance) with a twin-block (TB)-treated group. Thirty patients (18 girls and 12 boys) with a mean age of 10.5 ± 0.7 years were treated with the R-appliance for 16.2 ± 0.3 months and 25 (11 boys and 14 girls) with a mean age of 11.2 ± 1.3 years with a TB for 16.1 ± 1.4 months (control). All had a Class II division 1 malocclusion due to mandibular deficiency. Lateral cephalograms obtained at the beginning (T1) and end (T2) of the study were analysed. Paired t-tests showed that SNB significantly increased in both groups. The incisor mandibular plane angle (IMPA) was reduced in the R-appliance group by 1.9 ± 4.9 degrees ($P<0.04$) but increased by 0.5 ± 5.1 degrees ($P<0.6$) in the TB group. SNA in the R-appliance group showed an increase of 0.2 ± 1.8 degrees ($P<0.5$), while it was decreased by 0.2 ± 1.3 degrees ($P<0.3$) in the TB group. Both treatment modalities were successful in moving the mandible forward. However, with the R-appliance, this was achieved without retroclination of the lower incisors.