

FEATURES
SECTION

Evidence-based orthodontics

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Effect of 0.4% stannous fluoride gel on *Streptococci mutans* in relation to elastomeric rings and steel ligatures in orthodontic patients. *Am J Orthod Dentofac Orthop* 2005; 127: 428-33

Brêtas SM, Macari S, Elias AM, Ito IY, Matsumoto MAN

Objectives: To evaluate the number of *S. mutans* colony-forming units (CFUs) in the bio-film around orthodontic brackets ligated with either elastomeric modules or stainless steel (SS) ligatures and with or without the application of 0.4% stannous fluoride gel (SFG).

Design: A split-mouth randomized controlled trial.

Setting: São Paulo, Brazil.

Participants: Forty-seven patients having fixed appliance therapy.

Interventions: Fixed appliances were placed and ligated with SS ligatures and elastomeric modules in diagonally opposite quadrants. Participants were randomly divided to either receive usual oral hygiene instruction and an application of SFG every 15 days or continue with normal oral hygiene using stannous fluoride toothpaste, but not to use a fluoridated mouthwash. Saliva samples were taken before and after appliance placement, and again on days 15 and 30. SFG was applied following saliva collection on days 0 and 15. On day 30 saliva and bio-film samples were taken, and the brackets were removed from UR2, UL3, LR1 and LL2 and prepared for scanning electron microscopy.

Outcome measures: The number of *S. mutans* colony-forming units (CFUs) in the bio-film around the orthodontic brackets.

Results: There was no statistically significant difference in the CFUs in the saliva ($P=0.513$) or the bio-film from around the brackets that had either ligatures of modules attached at any of the collection times.

Conclusions: Neither the material used to ligate the brackets (SS or elastomeric modules) nor the application of 0.4% SFG every 15 days affected the number of *S. mutans* CFUs in the bio-film around the orthodontic brackets.

Implications: This study suggests that using stainless steel ligatures and/or applying a stannous fluoride gel every 2 weeks would not reduce the amount of decalcification occurring around orthodontic brackets.

Prospective clinical trial comparing the effects of conventional Twin-block and mini-block appliances: Part 1. Hard tissue changes. *Am J Orthod Dentofac Orthop* 2005; 127:465-72

Gill DS, Lee RT

Objectives: To compare the dentoskeletal effects of the Twin-block (TB) and mini-block (MB) appliances.

Design: A randomized controlled trial. Allocation to age and sex-matched pairs.

Setting: The Royal London Hospital, London, UK.

Participants: Seventy white patients with a Class II division 1 incisal relationship, mandibular retrognathia and an overjet ≥ 7 mm.

Interventions: Twin-block appliance activated to an edge-to-edge incisor relationship with 4 mm of opening or a mini-block appliance with maxillary incisor torquing spurs, incisor capping that was activated 3 mm vertically and sagittally, and re-activated progressively throughout treatment.

Outcome measures: Changes in dental and skeletal cephalometric variables from lateral cephalograms taken within 1 month of the start of treatment and at the 12 ± 1 month review.

Results: Sixty (85.7%) patients completed the trial. There was a significantly greater reduction in overjet ($P=0.02$), forward movement of pogonion relative to the S-vertical ($P=0.02$) and retroclination in the upper incisors ($P=0.04$) in the TB group compared with the

MB group. There were no statistically significant differences in the increase in vertical dimension or lower incisor proclination between the two groups.

Conclusions: The results of this study suggest that torquing spurs on the upper incisors reduce the retroclination of the upper incisors, but that reduced vertical opening did not limit the increase in vertical dimension and progressive advancement of the mandibular appliance did not reduce the amount of lower incisor proclination or increase the amount of mandibular growth occurring.

Implications: The addition of torquing spurs to the maxillary appliance, where minimal retroclination of the maxillary incisors are required, appears to be worthwhile. However, it does not appear to be an advantage to limit the amount of vertical opening or progressively advance the mandibular appliance.

Prospective clinical trial comparing the effects of conventional Twin-block and mini-block appliances: Part 2. Soft tissue changes. *Am J Orthod Dentofac Orthop* 2005; 127: 473-82

Sharma AA, Lee RT

Objectives: To compare the soft tissue effects of the Twin-block (TB) and mini-block (MB) appliances; the differences in postural relapse and relationship between the soft and hard tissue changes.

Design: A randomized controlled trial. Allocation to age and sex-matched pairs.

Setting: The Royal London Hospital, London, UK.

Participants: Seventy white patients with a Class II division 1 incisal relationship, mandibular retrognathia and an overjet ≥ 7 mm.

Interventions: Twin-block appliance activated to an edge-to-edge incisor relationship with 4 mm of opening or a mini-block appliance with maxillary incisor torquing spurs, incisor capping that was activated 3 mm vertically and sagittally, and re-activated progressively throughout treatment.

Outcome measures: Changes in soft tissue, variables measured from lateral cephalograms and optical surface laser scanning (OSLS), taken within 1 month of the start of treatment and at the 3, 9 and 12 ± 1 month review appointments.

Results: Sixty (85.7%) of patients completed the trial. There were no statistically significant differences in soft tissue OSLS measurements between the two groups.

There was significantly greater increase in facial convexity ($P=0.04$) and advancement of soft tissue pogonion relative to S-vertical ($P=0.004$) in the TB group compared with the MB group. There was a close correlation between the movement of hard and soft tissue pogonion.

Conclusions: The results of this study suggest that there were few differences between the soft tissue changes of patients treated with the TB or MB. The TB appliance induced more advancement of soft and hard tissue pogonion than the MB.

Implications: The TB appliance appears to induce more A-P change in the position of the chin than the MB. The addition of torquing spurs and progressive advancement of the mandibular appliance does not appear to be an advantage in terms of their effects on the soft tissues.

Skeletal and dental response to rapid maxillary expansion with 2- versus 4-band appliances. *Am J Orthod Dentofac Orthop* 2005; 127: 483-492

Davidovitch M, Efstathiou S, Sarne O, Vardimon AD

Objectives: To determine investigate and compare the skeletal and dental effects of conventional 4- and 2-band rapid palatal expansion (RPE) devices

Design: A randomized controlled trial.

Setting: Tel-Aviv School of Dental Medicine, Israel.

Participants: Twenty-eight patients with maxillary transverse deficiencies.

Interventions: Palatal expansion with either a 2-band (bands 6 | 6) or a 4-band (bands 6 4 | 4 6) RPE device.

Outcome measures: Dental and skeletal variables measured from A-P cephalograms, occlusal radiographs and study models.

Results: There were significantly more sutural expansion and arch perimeter increase in the 4- than the 2-band group at the end of expansion. Significant amounts of relapse of the skeletal changes occurred during retention and the differences between the two groups had been lost at the end of retention.

Conclusions: This study suggests that there is very little difference between the 4- and the 2-band RPE groups in the eventual expansion obtained.

Implications: Although the 4-band RPE device produced significantly more expansion it appears that there is little to choose between the effects of the 4-band versus the 2-band RPE in the eventual amount of

expansion obtained. However, this was a relatively small study and there was considerable individual variation in treatment effect so a larger study would be valuable.

Angle Orthodontist

Rapid maxillary expansion—tooth tissue-borne versus tooth-borne expanders. *Angle Orthod* 2005; 75: 548–57
Garib DG, Henriques JFC, Janson G, Freitas MR, Coelho RA

Objectives: To compare the dentoskeletal effects of rapid maxillary expansion (RME) produced by a tooth-tissue borne and a tooth-borne expansion devices.

Design: A randomized controlled trial.

Setting: Bauru School of Dentistry, São Paulo, Brazil.

Participants: Eight patients with a unilateral or bilateral crossbite.

Interventions: Palatal expansion with either a tooth-tissue borne (Hass) and a tooth-borne (Hyrax) expansion device.

Outcome measures: Dental and skeletal variables measured from computed tomography scans.

Results: The Hass appliance produced statistically significantly more expansion at the level of the lingual dentoalveolar crest and tipping of $\underline{6} | \underline{6}$ than the Hyrax appliance. There were no statistically significant differences in other variables measured.

Conclusions: This study suggests that the Hass appliance produces more expansion than the Hyrax appliance but that this is likely to be the result of more tipping of $\underline{6} | \underline{6}$, rather than skeletal expansion.

Implications: Although the Hass appliance produced significantly more expansion it did so at the expense of more tipping. However, this was a very small study so the results must be viewed with caution.

Dentofacial effects of asymmetric headgear and cervical headgear with removable plate on unilateral molar distalization. *Angle Orthod* 2005; 75: 584–92

Altug H, Bengi O, Akin E, Karacay S

Objectives: To evaluate and compare the dentoskeletal changes produced by cervical headgear and a removable plate (CHG+URA), and asymmetric headgear (AHG).

Design: A randomized controlled trial.

Setting: Ghlhane Military Medical Academy, Ankara, Turkey.

Participants: Twenty patients with a Class I skeletal pattern and unilateral Class II molar relationship.

Interventions: Cervical headgear used with a removable plate or asymmetric headgear, with 250g force used in both groups.

Outcome measures: Dental and skeletal variables measured from lateral and basilar radiographs.

Results: The interventions resulted in virtually identical amounts of distal movement and tipping of the Class II molar ($P>0.05$), but the asymmetric headgear produced significantly more distal movement and tipping ($P<0.05$) of the passive molar. Both interventions produced significantly more distal movement of the Class II molar than the passive molar (CHG+URA $P=0.00001$; AHG $P=0.005$), but the difference was not statistically significantly different.

Conclusions: This study suggests that both interventions produced differential distal movement of the molars but it was associated with significant tipping of $\underline{6} | \underline{6}$, rather than bodily movement.

Implications: The asymmetric headgear did not appear to produce more differential distal movement than the CHG+URA.

European Journal of Orthodontics

An investigation into the use of two polyacid-modified composite resins (compomers) and a resin-modified glass poly(alkenoate) cement to retain orthodontic bands. *Eur J Orthod* 2005; 7: 245–51

Williams PH, Sherriff M, Ireland AJ

Objectives: To compare a polyacid-modified composite resin (Transbond™ Plus, 3M Unitek, St Paul, Minnesota, USA) and a resin-modified glass poly(alkenoate) cement (Intact, Orthocare UK Ltd, Bradford, UK) to retain orthodontic bands.

Design: A split mouth randomized controlled trial.

Setting: Hospital Orthodontic Department, UK.

Participants: Thirty patients requiring bands to be placed on their upper and lower first permanent molars who did not require additional banded appliances, e.g. quadhelix.

Interventions: Transbond™ Plus, a polyacid-modified composite resin and Intact, a resin-modified glass

poly(alkenoate) cement to retain orthodontic bands to first permanent molars.

Outcome measures: Band failure over 12 months and the patients' perception of the taste of the cements.

Results: There were only three band failures (out of 120 bands placed) over the 12 months (two Intact, one Transbond™ Plus). This was too few to allow statistical analysis. There was a statistically significant difference in the perception of the taste with Intact being judged to have the better taste ($P=0.001$).

Conclusions: There was very little difference between Intact and Transbond™ Plus in the band failure rate over 12 months, but patients found the taste of Intact least unpleasant.

Implications: With little difference between the bond failure rate of Intact and Transbond™ Plus other factors, including clinician and patient preferences, will determine which cement is used.

The psychosocial effects of cleft lip and palate: a systematic review. *Eur J Orthod* 2005; 27: 274-85

Hunt O, Burden D, Hepper P, Johnston C

Objectives: To evaluate the scientific evidence linking cleft lip and palate (CLP) with an increased risk of psychosocial problems.

Design: A systematic review.

Data sources: Several databases were searched using appropriate keywords. Relevant journals were hand searched to identify relevant studies not identified by the electronic searches. No language restrictions were applied.

Study selection: Studies that were retrospective, prospective, cross-sectional or longitudinal and were controlled or uncontrolled were included if they focused on children or adults with repaired non-syndromal CLP.

Data extraction: One reviewer assessed all the titles and abstracts for potential inclusion and a second reviewer assessed a random sample of 50 of these. Ninety-six per cent agreement was obtained on whether the studies should be included. Disagreements were resolved following reference to the full papers. of selected articles for final inclusion. Data were extracted on the age of the participants, sample and size, outcome measurement, control group, psychosocial parameters investigated, whether data were self-reported or reported by others.

Data synthesis: No formal data synthesis was undertaken due to the large variation in study design and outcome measures used.

Results: The search strategy identified 656 potentially eligible studies of which 539 were excluded. A total of 117 full texts were examined of which 64 studies were thought to be suitable for inclusion in the review. Less than a half of studies used a control and only nine were longitudinal. Some areas, e.g. behavioural problems or dissatisfaction with appearance, appear to cause difficulties for those with CLP, but on the basis of available evidence it is impossible to state the extent of the problem with any certainty. Associations were found between cleft type and some psychosocial problems (e.g. CLP and dissatisfaction with appearance and marrying later; cleft palate only and insecure attachments and learning difficulties), but the evidence is not strong, making it difficult to state that one type of cleft results in more psychosocial problems than another.

Conclusions: A significant amount of literature on the subject was found, but the studies lacked uniformity in method and outcome assessment so it was difficult to determine the actual psychosocial impact of CLP. Some limited evidence was found to suggest that some people with CLP do have psychosocial problems, but most appear to adapt and function reasonably well.

Implications: Generally, people with a CLP appear to adjust and function quite well, although some specific psychosocial problems may arise. However, the evidence base for this is weak and studies using appropriate longitudinal methods and consistent outcome measures are required.

A subjective comparison of two lingual bracket systems. *Eur J Orthod* 2005; 27: 274-85

Stamm T, Hohoff A, Ehmer U

Objectives: To compare whether the difference in profile between prefabricated and customized lingual brackets affects oral comfort, speech, mastication and oral hygiene.

Design: A randomized controlled trial.

Setting: University hospital, Münster, Germany.

Participants: Forty-two adults who were native speakers of standard German.

Interventions: Ormco® (Ormco, Amersfoot, The Netherlands) seventh-generation (pre-fabricated) or

Incognito (TOP Services, Ormco) (customized, low profile) lingual brackets.

Outcome measures: Standardized questionnaires, with a 5-point ordinal scale, were used to assess the patients' perception of oral comfort speech, mastication and oral hygiene at bond-up and at 24 hours and 3 months after bond-up.

Results: Patients' perception of the Incognito brackets was more favourable than of the Ormco® seventh-generation brackets with respect to available tongue space, speech disturbances and problems with eating ($P < 0.001$ – 0.016). There were no statistically significant

differences in patients' perception of their tongue position, conversation pattern swallowing or ability to maintain oral hygiene.

Conclusions: All lingual appliances had a significant impact on speech and oral comfort, but it appears that the customized Incognito brackets caused least impairment.

Implications: Patients need to be informed that any form of lingual appliance will affect speech, eating and oral comfort. It may be worthwhile using customized brackets that have a lower profile to minimize the problems caused by these appliances.