

**ARTICLES SELECTED AND REVIEWED BY:
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HEALTH**

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**The relationship between posterior
crossbites and temporomandibular
disorders**

**Thilander B, Bjerklin K. Posterior crossbite and
temporomandibular disorders (TMDs): need for
orthodontic treatment? Eur J Orthod 2011 Sep 6
[Epub ahead of print].**

Temporomandibular disorder (TMD) is a generic term for several clinical signs and symptoms involving the masticatory muscles, the temporomandibular joints, and the associated head and neck structures. Clinical signs include clicking, disc displacement and tenderness on palpation of the masticatory muscles, and patient complaints of headaches. The authors noted that there is controversy on whether posterior crossbites are associated with TMD. Posterior crossbites can be classified into skeletal, dentoalveolar, and those associated with forced guidance of the mandible (functional types). The authors investigated whether certain signs or symptoms of TMD are associated with the types of posterior crossbite mentioned above. Comprehensive MEDLINE electronic database and hand searches from 1970 to 2009 were done, including only randomized controlled trials, retrospective studies with controlled groups, controlled clinical trials, and prospective studies. The searches yielded 14 articles, of which 8 reported an association with TMD (total $n = 6675$) and 6 reported no association (total $n = 6298$). Many articles did not mention the type of posterior crossbite, although 3 reported the functional type and found it to be significantly associated with TMD signs and symptoms ($n = 5226$). Forced guidance of the mandible could result in asymmetric activity of the masticatory muscles, thus modifying growth and development. When the mandible is displaced into an intercuspal position, the condyle on the crossbite side would be forced upward and laterally against the glenoid fossa, resulting in a changed condylar position that could produce temporomandibular joint pain and clicking. These authors suggested a need to distinguish between the different types of crossbite in

future studies and a need to intervene early when there is a functional crossbite.

Reviewed by Leo Toureno

**Transversal maxillary dentoalveolar
changes with self-ligating brackets**

**Cattaneo P, Treccani M, Carlsson K, Thorgeirsson
T. Transversal maxillary dento-alveolar changes in
patients treated with active and passive self-ligating
brackets: a randomized clinical trial using CBCT-
scans and digital models. Orthod Craniofac Res
2011;14:222-33.**

The aim of this randomized clinical trial was to compare the outcome of treatments with active or passive self-ligating brackets. Pretreatment and post-treatment cone-beam computed tomography scans and digital models were used to assess transversal tooth movement and buccal bone modeling of the maxillary lateral segments. Forty-one patients from the orthodontic department at Aarhus University in Denmark were randomly selected and assigned to either a passive self-ligating group (Damon 3 MX) or an active self-ligating group (In-Ovation R). Measurements before and after treatment were made on cone-beam computed tomography scans and digital models by a blinded observer. *T* tests were used to statistically analyze the differences between transversal expansion, buccolingual inclination, and bone area modeling. The results showed that transversal expansion was achieved by buccal tipping in all but 1 patient in each group. There were no noted differences in the buccolingual inclination of the maxillary posterior teeth between the 2 groups. The bone areas buccal to the second premolars decreased by an average of 20% in the passive self-ligating group and by 14% in the active self-ligating group. This study showed that, despite dental expansion, hardly any buccal bone augmentation could be seen. Despite limitations in the measurement of alveolar bone changes on the cone-beam computed tomography images, the authors reported that the expected expansion by translation and buccal bone modeling using active or passive self-ligating brackets could not be confirmed. Individual factors such as initial tooth inclination and occlusion influenced the treatment outcomes; therefore, the authors recommended performing future, patient-specific analyses.

Reviewed by Jamie Haas

Treatment of palatally impacted canines by rapid maxillary expansion with or without a transpalatal arch

Baccetti T, Sigler LM, McNamara JA Jr. An RCT on treatment of palatally displaced canines with RME and/or a transpalatal arch. Eur J Orthod 2011;33:601-7.

Palatally displaced canines is a condition that needs to be corrected as early as possible once when this problem is identified. The aim of this randomized controlled trial was to assess the success rate of different orthodontic interventions on the eruption of potentially palatally impacted canines in the late mixed dentition. The authors divided 120 subjects with ages from 9.5 to 13.0 years at the beginning of the experiment into 4 groups: (1) rapid maxillary + transpalatal arch and extraction of the deciduous canines, 40 subjects; (2) transpalatal arch and extraction of the deciduous canines, 25 subjects; (3) extraction of the deciduous canines only, 25 subjects; and (4) control, 30 subjects. Chi-square tests ($P < 0.05$) were used to compare successful and unsuccessful eruptions of palatally displaced canines. The success rates in treatment groups 1 through 3 and the control group were 80%, 79.2%, 62.5%, and 27.6%, respectively; thus, there were statistically significant differences between the groups, except between groups 1 and 2 with no statistical difference. Even though many studies have suggested that extraction of the deciduous canine alone can double the chance of eruption of the potentially impacted canine in the late mixed dentition, this study found that treatment with rapid maxillary expansion followed by a transpalatal arch and deciduous canine extraction was as effective as a transpalatal arch combined with deciduous canine extraction, and more effective than extractions solely, in solving palatally displaced canines. Therefore, interceptive orthodontic treatment by using only a transpalatal arch and extraction of the deciduous canines in the late mixed dentition seems to be a reasonable and efficient way to prevent palatal impaction of the maxillary canines.

Reviewed by Thian Srisurapol

Bone reaction at insertion of orthodontic mini-implants

Rebaudi A, Laffi N, Benedicenti S, Angiero F, Romanos GE. Microcomputed tomographic analysis of bone reaction at insertion of orthodontic mini-implants in sheep. Int J Oral Maxillofac Implants 2011;26:1233-40.

Unlike self-drilling mini-implants, self-tapping orthodontic mini-implants (OMIs) require a drilled osteotomy site before placement. In this in-vivo study on sheep, the OMI manufacturer recommended a 1.2-mm diameter osteotomy before placing the 1.6-mm diameter self-tapping screw. The authors sought to determine whether placement of a self-tapping OMI in a smaller osteotomy site would make the OMI more retentive. They compared OMIs placed in 1.2-mm sites with those placed in 1.0-mm sites, and measured the amount of implant driver torque required to remove the OMI immediately after insertion and 8 weeks after insertion. When placed and removed immediately, the 1.0-mm site required slightly more torquing force to remove the OMI than did the 1.2-mm site. However, after 8 weeks, those placed in a 1.0-mm osteotomy site required significantly less torque for removal than those placed in the 1.2-mm site. The authors concluded that this might indicate more bone relaxation in the smaller site. They also harvested a group of implants for microcomputed tomography analysis and concluded that bone from the 1.0-mm sites had less bone-to-implant contact than did the 1.2-mm sites at 8 weeks after placement. Limitations of the study were that it tested unloaded OMIs, submerged in soft tissue and later uncovered, in about 4 mm of cortical bone in sheep. The results might not be the same in humans, whose cortical bone is usually only 1 to 3 mm, and most OMIs are not placed in 2 stages. Additionally, immediate loading of OMIs with orthodontic force could yield a different result.

Reviewed by Chase Dansie