

**ARTICLES FROM THE CURRENT  
ORTHODONTIC LITERATURE, SELECTED AND  
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## Effects of the mandibular protruding device

**Fransson AM, Kowalczyk A, Isacson G. A  
prospective 10-year follow-up dental cast study of  
patients with obstructive sleep apnoea/snoring who  
use a mandibular protruding device. Eur J Orthod  
2017;39:502-8.**

Patients suffering from obstructive sleep apnea seek treatment from their physician. The most commonly recommended treatments are continued positive airway pressure, mandibular advancement device (MAD), and mandibular protruding device (MPD). The MPD is recommended by American College of Physicians as an alternative therapy for those who suffer adverse effects from continuous positive airway pressure or the mandibular advancement device. Even though MPDs can lead to significant improvement in sleep apnea and snoring, previous studies have shown adverse dentoskeletal effects. The aim of this prospective observational study was to measure and evaluate the positions of teeth and occlusion on dental casts after 10-year nocturnal use of MPDs in subjects with OSA or snoring. For this study, 77 subjects diagnosed with obstructive sleep apnea or snoring were treated with an MPD. These subjects had enough teeth to retain the device and good dental health. Dental casts with jaw registration at maximum intercuspation were fabricated. The MPDs were made with heat-cured methyl methacrylate resin (Microdent, Forshaga, Sweden). The mandible was positioned a minimum of 5 mm forward and as much as 75% of maximum forward position. The MPD was designed as

a monobloc appliance with full occlusal coverage. At the 10-year follow-up, 60 of the 77 participants returned; of them, 41 still used the MPD, and 19 had discontinued using it. Analysis of casts obtained at the 10-year follow-up showed significant decreases in overjet (1.8 mm) and overbite (1.5 mm) in the MPD users compared with minimal decreases in overjet (0.3 mm) and overbite (0.6 mm) in those who had ceased usage. The MPD users also demonstrated increased posterior infra-occlusion and mesio-occlusion of the mandible. The authors concluded that long-term use of MPDs can adversely affect occlusion mostly in the anterior region (by reducing overjet and overbite) and in some cases may lead to posterior infra-occlusion. They also suggested that Class III patients may not be suitable for MPD usage because of the potential for mesial drift of the mandibular teeth.

*Reviewed by Pardis Parizadeh*

## Timing of expansion treatment

**Masucci C, Cipriani L, Defraia E, Franchi L.  
Transverse relationship of permanent molars after  
crossbite correction in deciduous dentition. Eur J  
Orthod 2017;39:560-6.**

The purpose of this retrospective study was to evaluate the effects of the correction of posterior crossbites during the deciduous dentition with 2 expansion protocols on the transverse relationships of the permanent first molars in the mixed dentition. Ninety patients (40 boys, 50 girls) with posterior unilateral or bilateral crossbite in the deciduous dentition were selected from 5000 patients treated at the Unit of Orthodontics of the University of Florence in Italy from 1975 through 2014. Sixty patients were treated with a removable expansion plate, and the remaining 30 were treated with a rapid maxillary expander. Dental casts were evaluated at pretreatment (mean age,  $5.1 \pm 0.7$  years) and posttreatment (when the permanent first molars were fully erupted (mean age,  $7.7 \pm 1.0$  years)). The prevalence rates for posterior crossbite on the permanent first molars in the 2 groups were compared with the chi-square test with the Yates correction. At posttreatment, 34.4% of the patients demonstrated posterior crossbites on the permanent first molars: 28.3% in the removable expansion plate group and 46.6% in the rapid maxillary expansion group. No significant predictors for the "presence/absence of posterior crossbite on the first permanent molars" at posttreatment were found, even when evaluating sagittal skeletal relationship or sex distribution or posterior transverse interarch discrepancy. The authors recommended that expansion treatment

should be delayed until after the permanent first molars had fully erupted.

*Reviewed by Inessa Kandov*

## Tooth-bone-borne expansion

**Bazargani F, Magnuson A, Ludwig B. Randomized controlled trial effects on nasal airflow and resistance using two different RME appliances: a randomized controlled trial. Eur J Orthod 2017 Oct 21 [Epub ahead of print].**

Rapid maxillary expansion (RME) is the most common treatment modality prescribed for a skeletally constricted maxillary arch in adolescents. The maxillary bones form a large portion of the nasal cavity's anatomic structure, suggesting that treatments that deliver changes to the maxillary bones will affect the nasal cavity. The purpose of this study was to evaluate and compare the influence of tooth-borne and tooth-bone-borne RME on nasal airflow and nasal resistance in growing children with constricted maxillae. Forty subjects, ages 8 to 13 years, in the early or late mixed dentition with either unilateral or bilateral crossbite and a constricted maxilla agreed to participate in this study. All participants had before and after treatment study casts taken and were sent to an ear-nose-throat doctor for before and after treatment rhinomanometric measurements. The participants were randomly allocated to 2 groups using the concealed allocation principle in a 1:1 ratio as required by SPSS software. Group A received the tooth-borne expansion, and group B received the tooth-bone-borne expansion. The tooth-bone-borne group participants were fit with 2 miniscrew implants ( $1.7 \times 8$  mm). Both expanders were activated by 2 quarter turns per day (0.5 mm) until the palatal cusps of the maxillary first molars contacted the buccal cusps of the mandibular first molars. Analysis showed significantly greater postexpansion nasal airflow values for the tooth-bone-borne group compared with the tooth-borne group, with a mean difference of  $51.0 \text{ cm}^3$  per second ( $P = 0.018$ ). The authors acknowledged that their results were short-term effects and that a longer follow-up period would have been preferred. They concluded that RME with tooth-bone-borne expansion significantly increased nasal airway flow and lowered nasal resistance values than did RME with tooth-borne expansion, and suggested that it might be prudent to use RME with tooth-bone-borne expansion when treating patients with maxillary constriction and upper airway obstruction.

*Reviewed by Blair Sittmann*

## Color changes according to incisor inclination

**Ciucchi P, Kiliaridis S. Incisor inclination and perceived tooth colour changes. Eur J Orthod 2017;39:554-9.**

Orthodontists are constantly striving to deliver the most ideal smile esthetics to their patients. The authors of this study aimed to evaluate the effect of incisor inclination on perceived tooth color changes. Head position was used to simulate the different relative angulations and torque expressions of teeth in 40 dental students using an overhead light source. Head angled downward  $15^\circ$  simulated retroclined incisors, head angled upward  $15^\circ$  simulated proclined incisors, and head at  $0^\circ$ , or natural head position, simulated a relative control. Photographs were taken and analyzed for color differences at the central incisor with computer software. Shade and color differences were determined by using a scale of red, blue, and green lights. It was found that the incisors at the upward  $+15^\circ$  position appeared lighter and had more red and blue colors, and those at the downward  $-15^\circ$  position appeared darker and with a redder color, likely because of less light reaching them. It was noted that as teeth age, they become darker in color. Therefore, the "retroclined" incisors caused patients to appear older compared with the "proclined" and natural head position groups. Although the study was limited by the fact that head movement instead of actual tooth movement was used, these findings are still clinically applicable and are important considerations when finishing patients.

*Reviewed by Emily A. Schadt*

## Surgery-first approach

**Yang L, Xiao YD, Liang YJ, Wang X, Li JY, Liao GQ. Does the surgery-first approach produce better outcomes in orthognathic surgery? A systematic review and meta-analysis. J Oral Maxillofac Surg 2017;75:2422-9.**

A recent paradigm shift has occurred in orthognathic surgery to reconsider treatment sequencing and opt to perform surgery before active orthodontics. The rationale for the surgery-first approach is to realize facial change immediately and decrease treatment time. This systematic review sought to examine the stability, efficacy, and surgical outcomes of a surgery-first approach compared with the conventional 3-stage method (presurgical orthodontics, orthognathic surgery, and

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