



# Orthodontic uprighting of a horizontally impacted third molar and protraction of mandibular second and third molars into the missing first molar space for a patient with posterior crossbites

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A 22-year-old woman came with a unilateral missing mandibular first molar and buccal crossbite. The open space was closed by protraction of the mandibular left second molar and uprighting and protraction of the horizontally impacted third molar using temporary skeletal anchorage devices, and her buccal crossbite was corrected with modified palatal and lingual appliances. The total active treatment time was 36 months. Posttreatment records after 9 months showed excellent results with a stable occlusion. (*Am J Orthod Dentofacial Orthop* 2017;151:572-82)

The development of temporary skeletal anchorage devices (TSADs) has opened a new paradigm in modern orthodontics, offering treatment options for many difficult conditions that were untreatable with conventional methods. Absolute anchorage can be achieved with TSADs because the anchorage device is fixed in bone, eliminating anchorage loss that caused dental shifting or tilting, side-effects commonly seen with conventional intraoral anchorage appliances.<sup>1</sup>

Edentulous spaces caused by missing mandibular first molars are a common problem for clinicians. Various methods have been used to replace or remove

this condition: dental implants, dental bridges, and space closure with orthodontics. TSADs allow maximum anchorage for molar protraction to close these spaces.<sup>2,3</sup>

Likewise, a posterior crossbite is a common malocclusion in deciduous and mixed dentitions.<sup>4</sup> It has been claimed that stimuli through the teeth and musculature are what maintain alveolar bone architecture and shape.<sup>5</sup> Changes in the stimuli acting on the bone cause bone remodeling. If a posterior crossbite is left untreated, it can lead to skeletal deformation, so it is imperative that tooth position and musculature be corrected as soon as possible to prevent complications.<sup>6</sup>

The primary feature of posterior crossbite is at least 1 tooth in the maxillary arch ectopically positioned buccally or lingually with respect to the corresponding mandibular tooth or teeth.<sup>7</sup> Posterior crossbite can be bilateral or unilateral. It also has been reported that in children with unilateral posterior crossbite, the activity of the temporal and masseter muscles can be disturbed, and that adolescent patients with posterior crossbite have an increased risk of developing temporomandibular disorders.<sup>8</sup> Better prognosis and simple correction of posterior crossbites are possible when patients are in the deciduous and mixed dentitions; therefore, a posterior crossbites should be corrected early to eliminate future functional and skeletal problems.<sup>9</sup> If these patients are treated as adults, we predict more side effects and prolonged treatment times.<sup>10</sup>

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**Fig 1.** Pretreatment facial and intraoral photographs.

In this case report, we present a woman with posterior crossbites and a missing mandibular left first molar. Her buccal crossbite was corrected successfully with modified palatal and lingual appliances, and the lingual crossbite was improved with wire expansion. Her missing mandibular left first molar space was closed by protraction of the left second molar and uprighting and protraction of the third molar using TSADs and a mandibular lingual holding arch with an extension arm. See [Supplemental Materials](#) for a short video presentation about this study.

#### **DIAGNOSIS AND ETIOLOGY**

A 22-year-old woman was referred to a private office for an evaluation of orthodontic treatment. Her chief complaint was protrusion of her maxillary anterior teeth. She had a dolichofacial pattern and a Class II appearance. A hyperactive mentalis muscle with lip strain was seen when she attempted to close her lips. She also

had decreased lower anterior facial height. There was no significant facial asymmetry.

Intraorally, she had proclined maxillary incisors with overjet of 8.5 mm and overbite of 70%. She showed an end-on Class II molar relationship on her right side, but the left-side molar occlusion was not classified because of her missing mandibular left first molar. She had moderate crowding in her maxillary arch and a deep curve of Spee in her mandibular arch. In addition, she had a slight lingual crossbite on her maxillary right first molar and a buccal crossbite on the maxillary left second molar. The occlusal anatomy and contour of the maxillary first molar crowns were poor. When her mandible was guided into centric relation, a functional shift was detected because of her posterior crossbites. Compared with her facial midline, her maxillary dental midline was coincident, but her mandibular dental midline was deviated 1.5 mm to the right ([Figs 1 and 2](#)).

A panoramic radiograph showed slightly different right and left condylar heads, but during the

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