



Case Report

Eight-year follow-up of bimaxillary transverse distraction osteogenesis

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ABSTRACT

The purpose of this case report was to describe the treatment, including 8-year follow-up records, of a patient with severe crowding due to narrow maxillary and mandibular apical bases. The treatment included bimaxillary transverse distraction osteogenesis to increase both the maxillary and mandibular arch perimeters simultaneously by increasing skeletal width. The advantages of distraction osteogenesis are discussed. The successful outcome depended on the collaboration between the orthodontist and the surgeon. Long-term stability illustrated improvement in occlusion, dental alignment, and facial morphology, without extraction of teeth.

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1. Introduction

Treatment planning decisions in the transverse dimension have historically been based on the presenting mandibular arch width and shape [1–3]. Historically, transverse mandibular deficiency with crowding of the mandibular anterior teeth has been treated with extraction of teeth or dentoalveolar expansion, both of which may present major aesthetic disadvantages for patients [1–7]. Extraction may induce negative changes in the facial profile, lip posture, nasolabial angle, and buccal corridors [3,7], in addition to being unstable [1,6,8].

Individualized diagnosis and treatment planning are essential to appropriately address each patient's needs and goals [2,4,5,7]. In compliance with this principle, transverse distraction osteogenesis (DO) [9] has been used to widen the mandible and maxilla [2,10]. Bimaxillary transverse DO allows for an increase in both the maxillary and mandibular arch perimeters simultaneously by increasing skeletal width [2,3,7], resolving the aesthetic demands of patients with dental crowding and severe transversal discrepancy [7,11–13].

Bimaxillary transverse DO theoretically stabilizes the newly formed arches [3]. The intercanine width can be increased predictably [1,4], and because the canines have not been moved

outside of the skeletal envelope, there should be less relapse of crowding [3]. Thus, the transverse envelope of discrepancy for mandibular alterations can be addressed by symphyseal osteotomy and gradual DO. However, the literature suggests investigations with longer follow-up [8,11,12,14]. The treatment presented here demonstrates widening through DO and correcting the basal bone problem by creating new bone to accommodate the teeth, eliminating the need for tooth extraction and offering stable results over 8 years [1,4].

2. Diagnosis and etiology

A female patient aged 42 years, 3 months with Class I malocclusion presented for orthodontic treatment, with a chief concern of “crooked teeth.” Facial photographs showed an increased lower third, a concave profile, and a normal nasolabial angle (Fig. 1A–1C). Intraoral photographs (Figs. 1D–1H) and dental casts (Fig. 2) evidenced narrow maxillary and mandibular arches, with arch-length deficiency. Both dental arches were severely constricted, and the maxillary arch was V-shaped, with a left posterior and an anterior cross bite that extended to the right lateral incisor. In the maxillary arch, the intercanine distance (ICD) was 27 mm, and the intermolar distance (IMD) was 26 mm; in the mandibular arch, these values were 22 and 30 mm, respectively. The patient also presented with over jet and an over bite of 2 mm, negative tooth-size discrepancies of 4 mm in the maxillary arch and 7 mm in the mandibular arch, and a deviation of the mandibular midline of 1.5 mm to the left side.

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Fig. 1. Pretreatment facial (A–C) and intraoral (D–H) photographs.

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