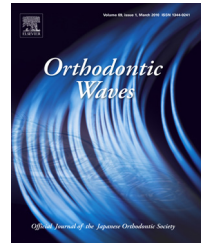


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## Case report

# Treatment of severe maxillary hypoplasia with oligodontia and complete bilateral cleft lip and palate by maxillary anterior segmental distraction osteogenesis

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## ABSTRACT

Effective maxillary advance treatment is difficult to achieve without impairing velopharyngeal function in patients with severe maxillary deficiency. We describe successful orthodontic treatment using maxillary anterior segmental distraction osteogenesis (MASDO) in a patient with cleft lip and palate. A 20-year-old woman with bilateral cleft lip and palate, multiple congenitally missing teeth, reduced maxilla, concave soft-tissue profile, and skeletal Class III jaw relationship was treated with a combination of orthodontic treatment and MASDO. After treatment, the anterior maxilla was displaced forward with new bone formation induced in the distraction gap for insertion of dental implants. Maxillary hypoplasia was successfully treated while preserving the velopharyngeal function with MASDO. We suggest that MASDO is useful for patients with severe maxillary hypoplasia.

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## 1. Introduction

Cleft lip and palate (CLP) is a craniofacial congenital malformation characterized by facial deformities affecting facio-maxillofacial growth and development, from childhood to adulthood. An interdisciplinary specialist team and a

multifaceted treatment plan are required to achieve optimal outcomes and ensure lifelong coordinated care.

In children, growth stimulation with maxillary protraction is the standard treatment for a receding maxilla, and is used to encourage a favorable sagittal skeletal response [1]. Adults with maxillary hypoplasia are treated with orthognathic Le Fort I surgery for maxillary advancement [2]. However,

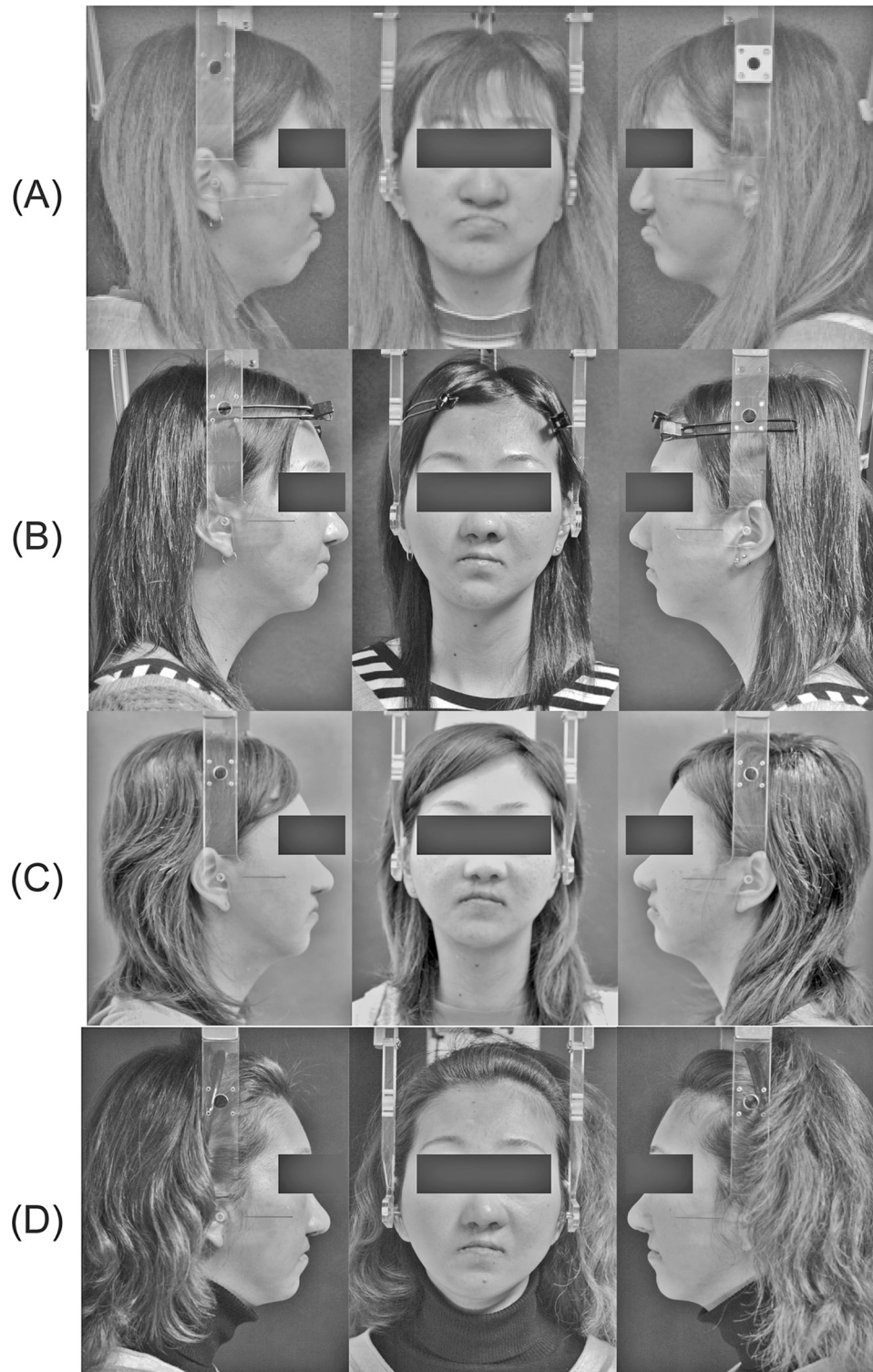
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inadequate velopharyngeal function may follow maxillary advancement [3,4]. A rigid external distraction (RED) system has also been used for treating marked maxillary hypoplasia [5]. Although this system has several advantages, patients face potential issues, such as scarring, facial nerve damage, and psychological effects [6]. This has led to replacement of the RED system with an internal device to reduce the physical and

psychological stress on patients [7]. However, it is difficult to position the 2 intraoral distractors correctly in parallel [8]. Moreover, velopharyngeal function may deteriorate after maxillary distraction because these procedures involve moving the entire maxilla at the Le Fort I level [4,9]. Therefore, maxillary anterior segmental distraction osteogenesis (MAS-DO), which only advances of the anterior maxillary segment,



**Fig. 1 – Facial photographs. (A) Pre-treatment (age: 20 years, 11 months); (B) post-treatment (age: 23 years, 2 months); (C) post-retention (age: 26 years, 4 months); (D) 4 years post-retention (age: 30 years, 2 months).**

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