

# Nasomaxillary hypoplasia with a congenitally missing tooth treated with LeFort II osteotomy, autotransplantation, and nickel-titanium alloy wire

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**Introduction:** In some skeletal Class III adult patients with nasomaxillary hypoplasia, the LeFort I osteotomy provides insufficient correction. This case report describes a 20-year-old woman with a combination of nasomaxillary hypoplasia and a protrusive mandible with a congenitally missing mandibular second premolar.

**Methods:** We performed a LeFort II osteotomy for maxillary advancement. Autotransplantation of a tooth was also performed; the donor tooth was used to replace the missing permanent tooth. To increase the chance of success, we applied light continuous force with an improved superelastic nickel-titanium alloy wire technique before extraction and after transplantation. **Results:** The patient's profile and malocclusion were corrected, and the autotransplanted tooth functioned well. The postero-occlusal relationships were improved, and ideal overbite and overjet relationships were achieved. **Conclusions:** The methods used in this case represent a remarkable treatment. (Am J Orthod Dentofacial Orthop 2015;148:479-92)

Comparative studies have shown the prevalence of Class III malocclusion to be related to race and ethnicity; the prevalences of Class III malocclusion have been reported as 13% for Japanese,<sup>1</sup> 14.5% for Chinese,<sup>2</sup> 19% for Koreans,<sup>3</sup> and 3% for white people.<sup>4</sup> The complications occurring in Class III patients can be classified as skeletal or dental; they include protrusive mandible, retrusive maxilla, and combinations of these.<sup>5,6</sup> Therefore, the appropriate treatment for any patient should be carefully planned according to the specific type of malocclusion.

Wassmund<sup>7</sup> was the first to perform a LeFort I osteotomy for dentofacial deformity correction, and Axhausen<sup>8</sup> was the first to advance the maxilla by this

method.<sup>9</sup> During the 1960s, American surgeons began to adopt and modify maxillary surgical techniques that had been developed in Europe. Bell<sup>10</sup> and Epker and Wolford<sup>11</sup> reported encouraging results in dentofacial deformity correction using the LeFort I down-fracture technique, and this technique was widely adopted for maxillary osteotomies performed to correct dentofacial deformities.

However, in nasomaxillary hypoplasia patients, the standard LeFort I osteotomy may be insufficient to correct the total extent of the maxillary problem.<sup>12</sup> Therefore, in some patients, the LeFort II osteotomy is the most efficient method for improving nasomaxillary hypoplasia. This technique was described by Henderson and Jackson<sup>13</sup> in a landmark article published in 1973.

The patient in this case report had a combination of nasomaxillary hypoplasia and protrusive mandible with a congenitally missing mandibular second premolar. We demonstrate a successful result after performing a LeFort II osteotomy for maxillary advancement and tooth autotransplantation using the improved superelastic nickel-titanium (NiTi) alloy wire technique.

## DIAGNOSIS AND ETIOLOGY

The patient, a 20-year-old woman, had an anterior crossbite and a persistent mandibular left deciduous

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All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.

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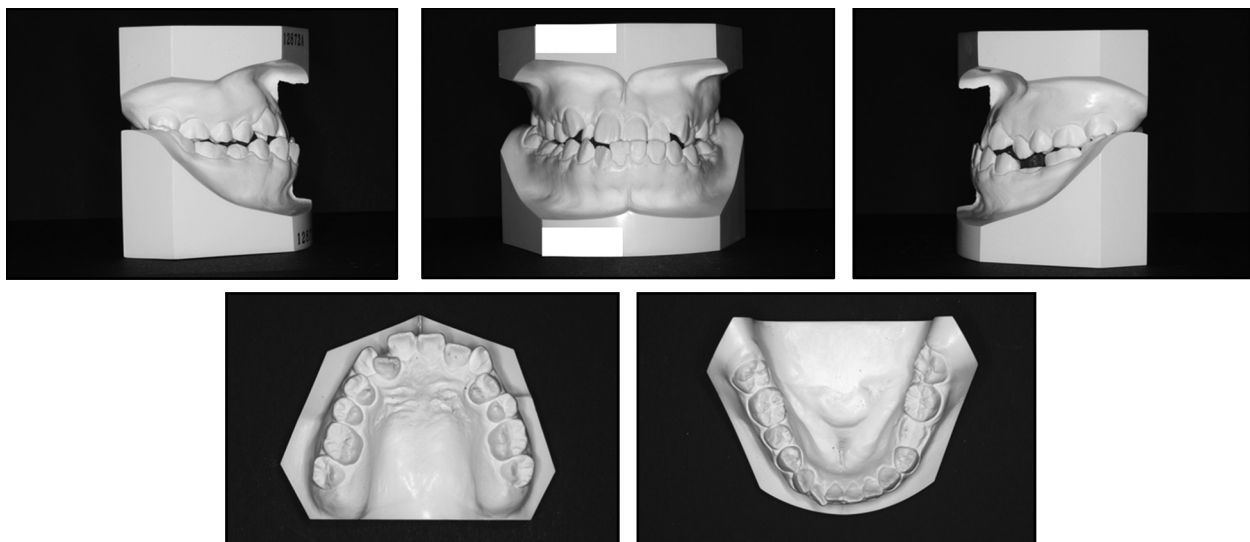
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**Fig 1.** Pretreatment facial and intraoral photographs.



**Fig 2.** Pretreatment dental casts.

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