

## Case Report

# Seven Years of Retention of Severe Mandibular Prognathism Treated With Bimaxillary Surgery: Two Case Reports

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### ABSTRACT

These case reports describe the surgical treatment of 2 male adult patients with severe mandibular prognathism. For both patients, anterior repositioning of the maxilla by Le Fort I osteotomies with and without impaction and mandibular posterior repositioning by sagittal split ramus osteotomies were performed. The aim of this case report is to identify successfully treated surgical cases maintaining the results throughout the follow-up period of 7 years.

**KEY WORDS:** Surgery, Prognathism, Retention

### INTRODUCTION

Correction of facial deformities with orthognathic surgery has been the solution for many people who are not pleased with their facial appearance. For over 30 years, orthognathic surgery has proved to be a significant tool in correcting severe dentofacial deformities. Although numerous articles have been reported on the surgical procedures of various dentofacial deformities, it is still a challenge to plan and perform orthognathic surgery for severe mandibular prognathism. Not only esthetic and functional rehabilitations but also stability after orthognathic surgery should be seriously considered in the treatment plan.

The objective of this article is to report 7 years of retention records of 2 severe dentofacial deformity cases treated with Le Fort I and sagittal split ramus osteotomies.

### REPORT OF 2 CASES

#### Diagnosis and Treatment Planning

Two patients with no contributory medical history were referred for the correction of their skeletal

deformity. The patients had protruded mandibles with no facial asymmetry. They had proper lip incompetence in the rest position. They did not have any symptoms of temporomandibular joint dysfunction.

Patient 1 was a 19-year-old man complaining about his prominent chin and difficulty in chewing and articulation. He had 4.5 mm of negative overjet and 7 mm of negative overbite (Fig. 1). He had Angle Class III molar and canine relationship. He had his left upper second premolar and first molar extracted. Cephalometric analysis confirmed that the mandible protruded 10 mm according to the cranial base and showed posterior rotation, moderately increasing facial height. The patient's treatment was initiated after the extraction of the lower left and upper right third molars and the infectious lower right first molar. The other third molars were preserved to close the extraction spaces in the dental arches. After the leveling phase and closing the extraction spaces for

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**Figure 1.** Pre-treatment extraoral and intraoral photographs of patient 1.



**Figure 2.** Pre-treatment extraoral and intraoral photographs of patient 2.



**Figure 3.** Post-treatment extraoral and intraoral photographs of patient 1.

6 months, the orthognathic surgery was planned. Three millimeters of maxillary impaction was planned to decrease the anterior facial height. As a result of the impaction, severe mandibular anterior rotation and thus increase in the negative overjet was considered. For this reason 5 mm of anterior repositioning of the maxilla and 9 mm of mandibular setback with sagittal split ramus osteotomy was planned to eliminate this negative overjet.

Patient 2 was a 23-year-old man asking for a new facial appearance. He had 11 mm of negative overjet and 2 mm of negative overbite (Fig. 2). He had Angle Class III molar and canine relationship. He had his upper first molars extracted. He had a 23-mm protruded mandible, which was indeed compensated with incisor inclination. After the extraction of lower third molars, treatment was initiated. Leveling phase with nickel-titanium archwires and decompensation of incisors lasted for 8 months. When the teeth were in desired position, 0.017×0.025-inch stainless steel archwire was applied and bimaxillary surgery was planned. While the maxilla was repositioned 5 mm anteriorly, the mandible was positioned 9 mm posteriorly.

In both cases, rigid fixation for the maxilla and semirigid fixation for the mandible with titanium miniplates were chosen to preserve the new positions of the skeletal structures.

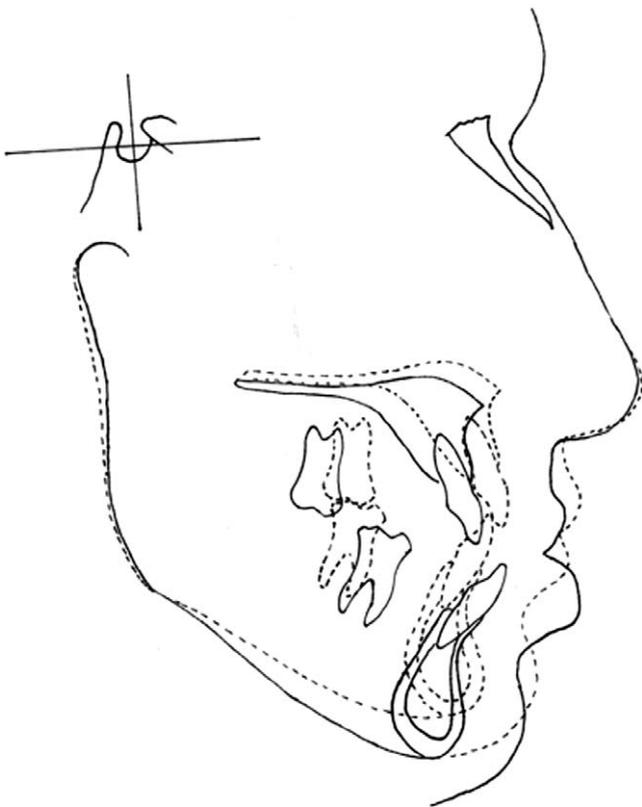
#### Treatment Outcome and Retention

At the end of the treatment, the postoperative results were satisfactory for both patients (Figs. 3 and 4). Overall, facial esthetics was improved considerably and so was the occlusion. The resulting canine and molar relationship was Angle Class I, with ideal overjet and overbite. Since patient 1 joined the army and patient 2 went abroad for education, the extraction spaces could not be closed properly. Cephalometric superimposition of pretreatment and posttreatment confirmed the changes listed below.

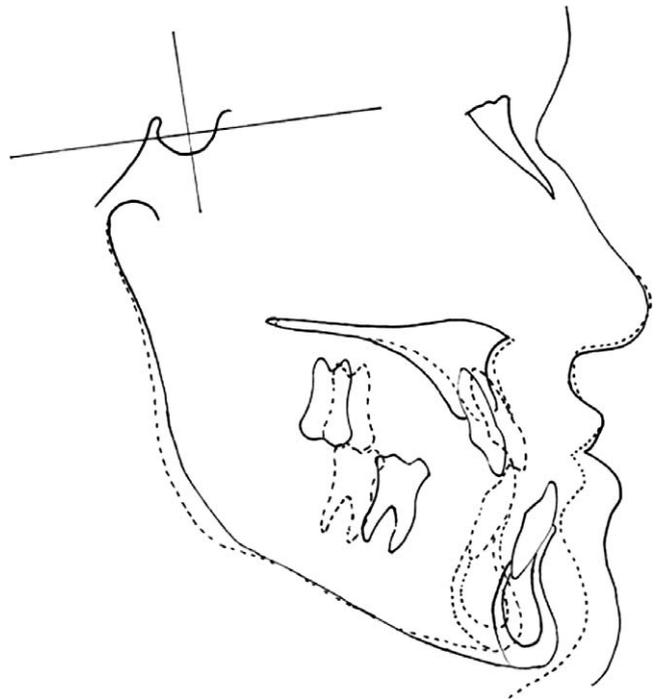
ANB angle improved from  $-1$  to  $3$  in patient 1 (Fig. 5) and from  $-9$  to  $-2$  in patient 2 (Fig. 6). GoGN/SN angle decreased  $6.5^\circ$  in patient 1 and  $3^\circ$  in patient 2. Altogether, there was a significant improvement in dentoskeletal relationship and lateral profile. Post-treatment cephalometric films revealed that soft tissue glabella, soft tissue subnasale, and menton were in harmony for both patients. The ratio of soft tissue glabella to soft tissue subnasale point and soft



**Figure 4.** Post-treatment extraoral and intraoral photographs of patient 2.



**Figure 5.** Superimposition of pre-treatment and post-treatment cephalometric films of patient 1.



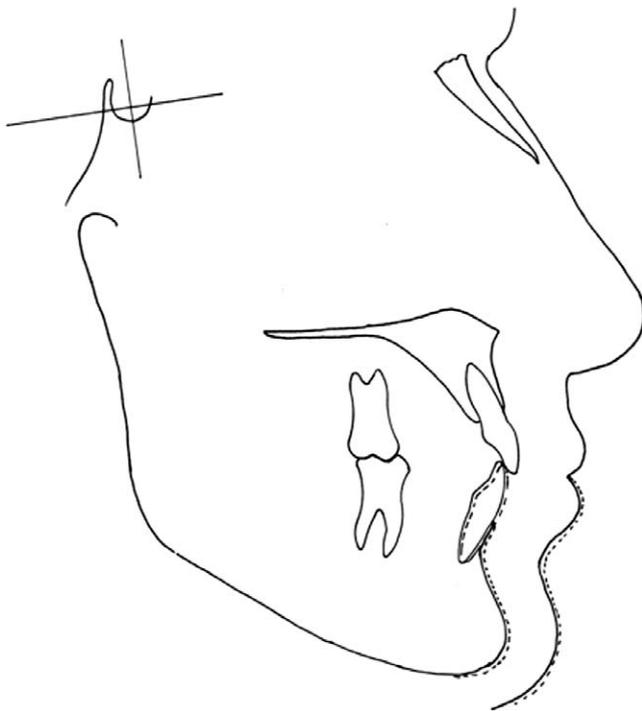
**Figure 6.** Superimposition of pre-treatment and post-treatment cephalometric films of patient 2.



**Figure 7.** Post-retention extraoral and intraoral photographs of patient 1.



**Figure 8.** Post-retention extraoral and intraoral photographs of patient 2.



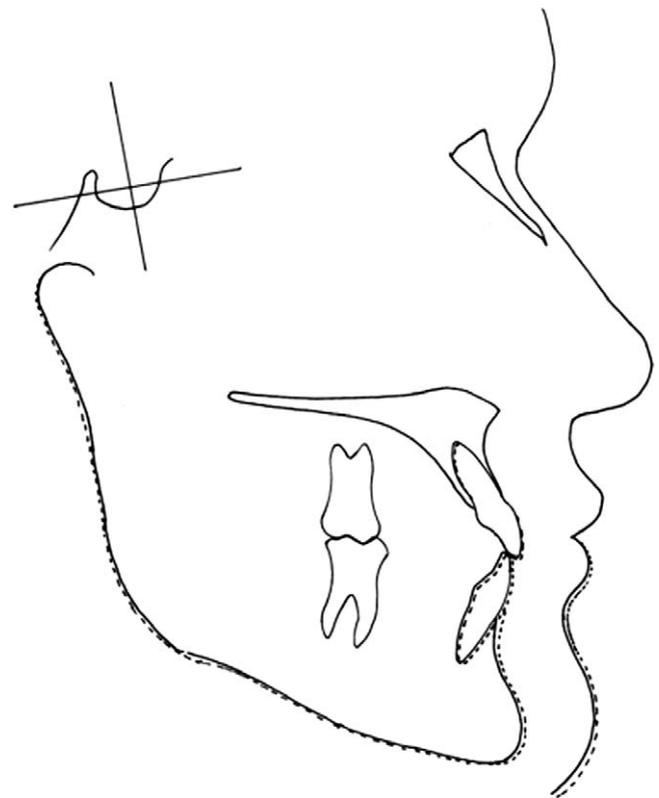
**Figure 9.** Superimposition of post-treatment and post-retention cephalometric films of patient 1.

tissue subnasale point to soft tissue menton was 1.1 for patient 1 and 0.8 for patient 2. The relationships of upper and lower lips to Steiner plane was  $-0.5$  and  $0.5$ , respectively in patient 1, but  $0$  and  $-2$  in patient 2.

The retention photographs taken after 7 years confirmed that the skeletal and soft tissue relationship has been maintained throughout this period (Figs. 7 and 8). According to the superimpositions of posttreatment and postretention radiographs, slight mandibular forward movement occurred (Figs. 9 and 10).

## DISCUSSION

In our cases, conventional Le Fort I and sagittal split osteotomies were used to advance the maxilla and set back the mandible. Bilateral sagittal split ramus osteotomy currently is the osteotomy of choice in the treatment of mandibular deformities.<sup>1-4</sup> However, with this method mandibular posterior repositioning is limited to 10 mm because the areas of bony contact would be very small as the mandible is rotated and moved backward for the desired occlusal relationship.<sup>5</sup> Apart from that, when the mandible is moved back, the volume of the oral cavity is reduced, and unless physiologic adaptation occurred, the tongue could block the airway.



**Figure 10.** Superimposition of post-treatment and post-retention cephalometric films of patient 2.

Improvements in surgical techniques have made it feasible to consider 2-jaw surgery for many patients who would have had only mandibular surgery.<sup>6</sup> In our cases, since the amount of mandibular setback with 1-jaw surgery would be more than 10 mm, we decided to perform 2-jaw surgery combined with maxillary anterior repositioning. In cases of mandibular prognathia, we mostly prefer maxillary surgery combined with mandibular surgery because maxillary surgery is both more esthetic and more stable than isolated mandibular procedures,<sup>7</sup> and it is known that smaller movements have a greater degree of long-term correction without relapse.<sup>8,9</sup>

In the present long-term cases, slight mandibular forward movement is clinically insignificant because the movement is less than 2 mm. This slight relapse could be the reason for semirigid fixation in the mandible. Although clinically relevant changes occur in a surprisingly large percentage of orthognathic surgery patients from 1 to 7 years after treatment,<sup>10</sup> there was no such relapse in our patients. Because maxillary advancement and superior positioning seems to be highly stable when compared with mandibular posterior movements,<sup>11</sup> in our cases there was no relapse in the maxilla.

## CONCLUSION

In our cases, skeletal disharmony was replaced with well-balanced facial esthetics. And, the results are patient satisfaction for all aspects and stability.

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