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Correcting protruding maxillary appearance through one-piece Le fort I osteotomy without premolar extraction



Multiple methods can be performed for the setback of the protruding maxilla through orthognathic surgery, including (1) performing setback of the anterior maxillary segment by closing the extracting premolar space,¹ (2) removing a part of the maxillary tuberosity,² and (3) performing cut-off of the pterygoid plate.³ If a patient does not require maxillary arch expansion or correction of the curve of Spee or lacks the premolar space for closure because of previous orthodontic treatment, Le fort I one-piece setback can serve as an alternative to segmental maxillary osteotomy for the correction of the protruding maxilla. This paper presented the case of a patient with bimaxillary protrusion but otherwise normal teeth alignment that required minimal tooth extraction for treatment. In such a case, Le fort I one-piece maxillary setback could provide positive outcomes and features with low treatment complexity.

A 26-year-old female patient visited our outpatient department. Her chief complaints were a square face and protrusive lips. After a clinical and radiographic examination, skeletal class I bimaxillary protrusion with a molar Angle class I relationship was diagnosed (Fig. 1A, B and C). This patient exhibited class I occlusion with good interdigitation; thus, repositioning the maxilla in one piece was considered the most appropriate treatment. After a discussion regarding surgical treatment, a Le fort I osteotomy

to impact and set back the maxilla and mandibular bilateral sagittal splitting osteotomy setback with advanced genioplasty were considered. For comprehensive assessment, including that of the bony interference, the surgical movements in the patient were designed and evaluated through virtual surgical planning (VSP),⁴ as illustrated in Fig. 1E. All bony interference sites caused by three-dimensional maxillary movement—including the perpendicular plate of the palatine bone, pterygoid plates, and maxillary tuberosity—were measured and recorded. With the help of the piezoelectric surgical instrument, the operation proceeded smoothly and accurately (Fig. 1D and f); subsequently, the patient presented with stable occlusion at the 13-month follow-up (Fig. 1D). She was satisfied with the aesthetic result.

For patients with bimaxillary protrusion and minimal maxillary vertical excess, combining maxillary subapical osteotomy with mandibular Kole procedures has been suggested in the literature.^{1,5} In addition to the treatment in the present case report, solitary one-piece Le fort I osteotomy setback may be performed under several other conditions: (1) when the setback distance is too short to extract the premolars, (2) when the space of the extraction sites has already been used to relieve dental crowding, (3) when there is no candidate for extraction because of

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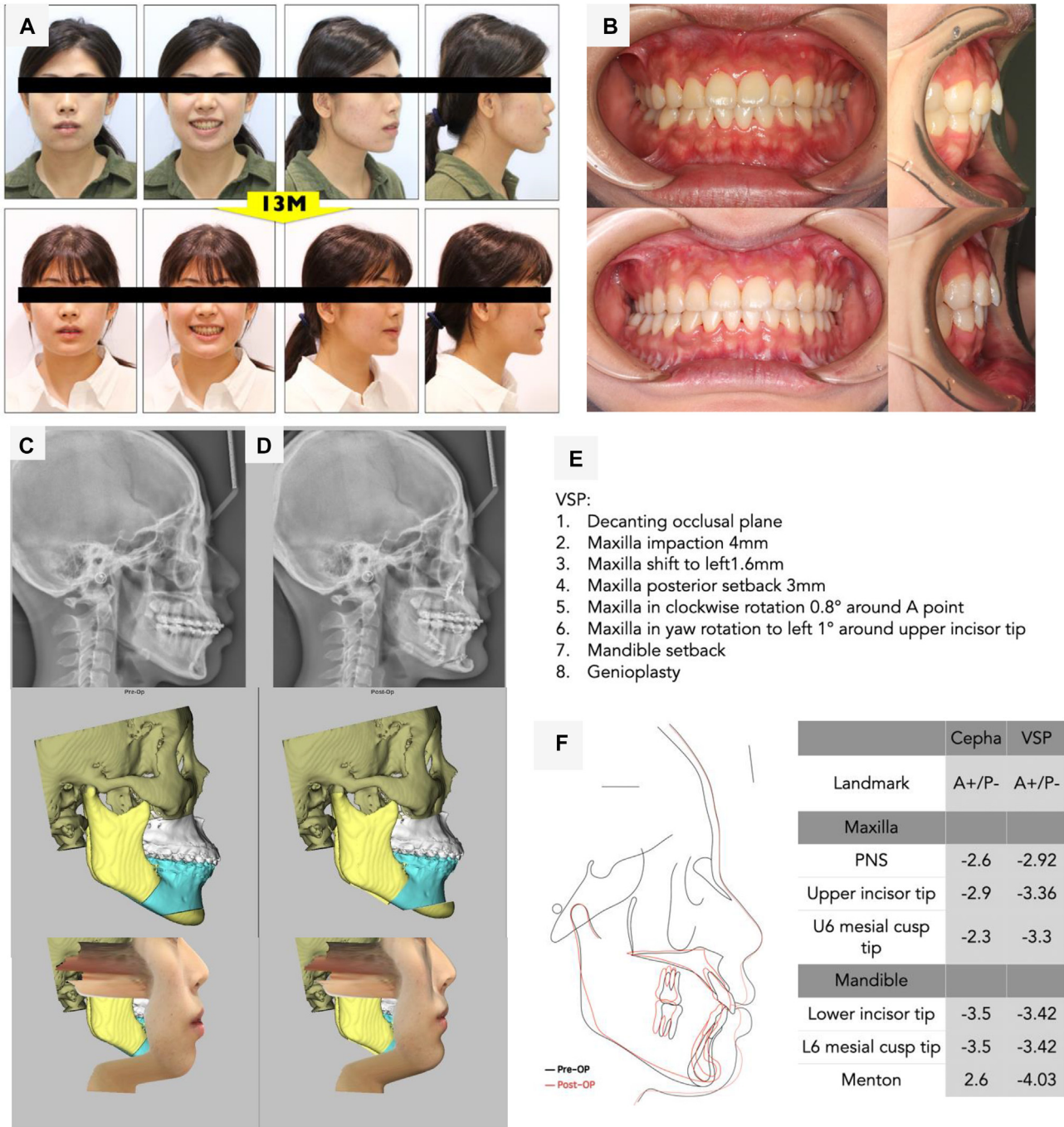


Figure 1 Clinical photographs, virtual surgical planning (VSP) demonstrations, lateral cephalogram, and analysis of our patient. (A) Initial and 13-month extraoral photographs; (B) initial and 13-month intraoral photographs; (C) preoperative lateral cephalometric films and VSP; (D) postoperative lateral cephalometric films and VSP; (E) VSP procedures; and (F) superimposition of preoperative and postoperative analyses. The preoperative and postoperative lateral cephalometric analyses show that the surgery proceeded uneventfully and in accordance with the VSP. The movements of the landmarks were measured in millimeters. Abbreviations and notes, A, move to anterior position; P, move to posterior position; L, move to left; R, move to right; impact, move to upper position; down, move to lower position.

congenital missing teeth or previous orthodontic treatment performed at early age, or (4) when demanded by the patient or orthodontic doctor. Furthermore, one-piece maxillary setback has many advantages, including (1) improvement in dentition; (2) treatment time reduction;

(3) no risk of compromising the vascular supply of the anterior maxillary segment or bone necrosis; and (4) no risk of the complications of segmental osteotomy, which include unpredicted bone splitting, nonunion or malunion, oro-antral fistula, periodontal damage, and damage to the

adjacent teeth. Finally, for the benefit of the patient, surgical variety should be considered by surgeons.

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Declaration of competing interests

The authors have no conflicts of interest relevant to this article to declare.

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