Modified basal osteotomy combined with osteogenic distraction (Hemi-Wing distraction) for correction of facial asymmetry: A new technique

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ABSTRACT

Complete restoration of facial asymmetry is always difficult to achieve. Facial asymmetry due to growth disturbances of the jaws almost requires orthognathic surgical correction, followed, in many cases, by soft tissue corrections. Mandibular hypoplasia is the earliest skeletal manifestation of Hemifacial microsomy and the clinical defect becomes worse with time, due to asymmetric growth and secondary midface deformity accompanying. Despite correction of the occlusal plane, facial asymmetry can persist if the mandibular body differs in height. We designed a new technique for skeletal correction of the mandibular basal plane combined with orthognathic surgery that avoided the disadvantages and limitations of other techniques. A 20-year-old male patient with facial asymmetry due to Hemifacial microsomy Type I also requires preoperative orthodontic treatment to align and level their teeth. He showed a 2mm midline shift to the left in combination with a cross bite of the left side. We decide to do a vertical enlargement of the mandibular left border by mandibular Hemiwing osteotomy and unilateral split ramus osteotomy for dental lines alignment with 8 mm of advancement of the hemi - wing genioplasty. Modified basal osteotomy combined with osteogenic distraction works better than the classic total basal osteotomy with autologous bone graft, if used for the correct indications. We advocate this technique for its efficacy, simplicity, and safety. This technique can be apply for correction of vertical and transverse discrepancies of the mandibular border and combined with sagittal ramus osteotomies for correction of asymmetrical dental lines and occlusal plane.

Keywords: Distraction, Hemi-Wing, orthognathic

INTRODUCTION

Complete restoration of facial asymmetry is always difficult to achieve. Despite correction of the occlusal plane, facial asymmetry can persist if the mandibular body differs in height.1,2

Facial asymmetry due to growth disturbances of the jaws almost always requires orthognathic surgical correction, followed, in many cases, by soft tissue corrections. Hemifacial microsomy is the condition most frequently associated with facial asymmetry.1,1 Mandibular hypoplasia is the earliest skeletal manifestation of hemifacial microsomy and the clinical defect becomes worse with time, due to asymmetric growth and secondary midface deformity. Despite correction of the occlusal plane, facial asymmetry can persist if the mandibular body differs in height. We devised a new technique for skeletal correction of the mandibular basal plane combined with orthognathic surgery that avoided the disadvantages and limitations of other techniques.

CASE REPORT

A 20-year-old male patient with facial asymmetry due to hemifacial microsomy Type I [Figure 1] also requires preoperative
orthodontic treatment to align and level his teeth. He showed a 2 mm midline shift to the left in combination with a cross bite of the left side. We decided to do a vertical enlargement of the mandibular left border by mandibular Hemi-Wing osteotomy and unilateral split ramus osteotomy for dental alignment with 8 mm of advancement with Hemi-Wing genioplasty. The mucosa was incised from the left ascending ramus of the mandible to the first premolar region and the other incision was made in the anterior zone; the mucoperiosteum raised just to the future line of a left basal osteotomy. An osteotomy was made in the ramus (Obwegeser Technique) for incomplete unilateral sagittal split osteotomy. Horizontal bicortical mandibular basal osteotomy was done to the posterior and anterior side with reciprocating saw. The mobilization of the segment was done with two large chisels, taking particular care to avoid the fracture around the mental foramen and advanced 8 mm. The osteotomy cut was completed below the estimated path of the inferior alveolar nerve. In the anterior region, the cut segment of bone was split into two parts and fixed with a titanium plate and monocortical screws. An alveolar distractor was then placed in the region of the molar and was fixed with bicortical screws of 2.0 system in the correct position (Figure 2). Postoperatively the patient had vertical augmentation of the left mandibular border (14 mm) with improved facial asymmetry and aligned occlusion (Figure 3).

DISCUSSION

Modified basal osteotomy combined with osteogenic distraction works better than the classic total basal osteotomy with autologous bone graft, if used for the correct indications. This method is applicable mainly in cases of asymmetry in the vertical and transverse plane, even if it allows the simultaneous correction of small sagittal discrepancies (maximum, 2-3 mm) or bilateral split ramus.

Particularly important is the fact that the cut segment of bone after wing osteotomy retains its vascularization. The repositioning of bony fragments results in correction of the intergonial angle, an important indicator of facial symmetry or asymmetry.[3] Splitting in the midline allows positioning of the cut segment of bone more laterally and corrects the lack of width in the mandible angle.

New surgical techniques to correct facial asymmetries have been proposed in recent literature.[3,6,7] However, all these modifications are much more difficult to perform than the reported technique. Moreover, because with these techniques transposition or rotation of the symphyseal bone segment requires detachment
from the soft tissues. This possible complication does not exist with hemi-genioplasty because the bone segment maintains a musculo-periosteal pedicle.

Reza et al., describe the evaluation of the efficacy of wing osteotomy for treating obstructive sleep apnea (OSA). In conclusion, this study improves signs of OSA. It may be a surgical option in retrognathic patients with OSA who are not candidates for conventional maxillomandibular advancement. This technique does not allow the correction of facial asymmetry only allows the correction of OSA.

Another study by Wenghoefer et al., suggests a slight modification of Albino Triaca’s chin-wing osteotomy to vertically correct the inferior border of the mandible in a patient with horizontal growth type facial asymmetry due to condylar hyperplasia.

We advocate this technique for its efficacy, simplicity, and safety. The technique should be applied mainly in facial asymmetries in the transverse plane, with discrepancies in the other special planes with correction of occlusal plane. Our technique combined orthognathic surgery in one stage with mandibular basal osteotomy with distraction for effective 3-D facial correction. [Figure 4].

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