Case Report

Management of Hemifacial Hypertrophy with Extended Corpus Angle V-Line Mandibular Ostectomy

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Abstract

Asymmetry is one of the most unusual and fascinating errors of human reproduction. A subtle asymmetric variation of the contralateral structures of the face occurs commonly in the general population, even in the absence of any local lesion or systemic conditions. Hemihypertrophy, congenital hemihypertrophy, hemimacrosomia, or partial gigantism are the terms used when the association of these changes with time or modifying circumstances such as trauma is missing. Meckel in 1822 gave the initial description, and the first report was by Wagner in 1839. This case report presents the case of a 20-year-old female with hemifacial hypertrophy, treated with “extended corpus angle V-line mandibular ostectomy” with modifications in armamentarium. Corrective procedure performed was in comparison to the contralateral side. Anterior half ostectomy, followed by posterior half ostectomy, was carried out with an oscillating saw, contra-angle handpiece, and curved chisel, respectively. Radiological assessment of the inferior alveolar nerve helped in planning the ostectomy and preservation of the nerve. Single-stage extended mandibular corpus-angle ostectomy has helped in accomplishing an esthetic correction.

Keywords: Corpus angle ostectomy, hemifacial hypertrophy, mandibular ostectomy, V-line ostectomy

INTRODUCTION

Asymmetry is one of the most unusual and fascinating errors of human reproduction. A subtle asymmetric variation of the contralateral structures of the face occurs commonly in the general population, even in the absence of any local lesion or condition.1 Some of these changes, however, may slowly but steadily progress to exhibit asymmetrical development. Hemihypertrophy, congenital hemihypertrophy (CHH), hemimacrosomia, or partial gigantism are the terms used when the association of these changes with time or modifying circumstances, such as trauma, is absent. The first description of this phenomenon was by Meckel in 18222 and was first reported by Wagner in 1839.3 Hemihypertrophy or hemihyperplasia is rarely reported and is often described in the literature as hemihypertrophy rather than hemihyperplasia. It may involve an entire side or an isolated part on one side of the body.4

Mandibular angle ostectomy has been popular since Baek et al. introduced it in 1989.4 Ostectomy with an oscillating saw through an intraoral approach has been the standard procedure for correcting prominent mandibular angles. The last two decades saw the rise of various modifications of these techniques.5,6 Although the procedure provides relatively satisfactory results, the major drawbacks comprised limited access and difficulty in controlling the blind ostectomy.7 With the modifications in the ostectomy to the body, angle, and symphysis, and with modifications in the armamentarium, near-normal esthetic correction can be achieved by recontouring the gonial angle (GA) and the mandibular plane angle in relation to the Frankfort horizontal plane.

CASE REPORT

We report the successful surgical management of a 20-year-old female patient who presented with the chief complaint of asymmetry near the lower third of face for 5 years [Figure 1].

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She had no history of trauma to the face. The patient had enlarged left lower facial half limited to the midline. The intraoral molar relation was Angles class I with midline shift to the right. After a thorough examination, we concluded on a working diagnosis of hemifacial hypertrophy.

**Preoperative planning**

To identify the nature and extent of the discrepancy, we employed the data from digital panoramic tomography [Figure 2], lateral cephalogram, and three-dimensional computed tomographic scans. Histological examination revealed a normal bone pattern in both maxilla and mandible, which confirmed the diagnosis of hemifacial hypertrophy. A positron emission tomography was then done, which revealed no growth spurts. Lateral cephalometric tracing with Burstone and Lagan analysis was performed to plan the thickness of bone removal. Since malocclusion was class I, we decided to proceed with the asymmetry correction on the mandibular angle and the lower border to accomplish conversational, and the patient desired esthetics in a single-stage procedure. Planning was done trying to maintain the near-normal values prescribed for the particular population. The treatment plan formulation consisted of orthodontic correction for midline shift and ostectomy of the inferior border of the symphysis, corpus, angle, and the posterior border of the mandible, representing to the “extended corpus angle V-line mandibular ostectomy.”

**Surgical technique**

The patient underwent general anesthesia through nasotracheal intubation. A 0.25% lidocaine solution with 1:200,000 epinephrine was used for initial transtracheal infiltration into the masseter muscle and in the angle ramus region, followed by an intraoral administration along with the incision line extending from the anterior border of the ascending ramus of the mandible to the midline. Subperiosteal tunneling was done from the anterior, posterior, and inferior border of the mandible, taking the necessary precautions to avoid damage to the retromandibular vein and the mental nerve. The masseter and the medial pterygoid muscles were detached from the angle using a periosteal elevator. Thus, the inferior posterior part of the ramus, GA, and the body was exposed to the midline.

The planned ostectomy was duplicated on the patient according to the radiographic measurements with the help of calipers. The ostectomy outline was marked with contra-angle handpiece using a round bur. The corpus angle ostectomy followed the curvilinear line which connected the two lines (one along the posterior border and the other along the anterior border of ramus) [Figure 3] at the posterior and inferior border of the mandible. The bur holes made with contra-angle handpiece were placed on the posterior part of the line and continued anteriorly till the symphysis region. Bur holes were placed with 2–3-mm intervals along the curvilinear line using a long shaft bur, drilling both the outer and inner cortex, which was later connected. Ramus-angle ostectomy was done using a contra-angle handpiece and completed with a curved chisel to overcome the difficulty in access. This maneuver had overcome the limited access through the intraoral approach which was almost impossible without complications. Using the curved chisel to complete the ostectomy, it was possible to control the direction of the medial blind ostectomy and also to safeguard the vital structures. After taking care to guard the medial anatomical structures, body and anterior lower border ostectomy were done with the sagittal saw. After separation of the ostectomized segments [Figure 4], a round bur was used to smoothen the inferior corpus border, angle, and posterior border of the ramus of the mandible postostectomy.
A minimum of 10 mm was kept from the mandibular canal bearing in mind the ultimate goal of near normal symmetry in comparison to the contralateral side. Thus, to correct the asymmetry, we performed an extended en bloc mandibular corpus-angle ostectomy (EMCAO).

Incisions were irrigated with dilute betadine and saline solutions. The extraoral drain was placed for 24 h. The intraoral incision was closed with 3-0 vicryl sutures. The compressive dressing was maintained for 3 days. Postoperative analgesic and the antibiotic regimen were continued for 7 days. Periodic patient recall showed excellent clinical and radiographical healing and results [Figure 4].

**Discussion**

Hemifacial hypertrophy is a rare developmental anomaly exhibiting asymmetric growth of one or more body regions. The condition may either be isolated or associated with a variety of multidimensional and variable faceted syndromes. Demographically, men and Whites are more commonly affected, and the right is more affected than the left. The condition accentuates with age, especially around puberty. Most evident signs of CHH manifest in the orofacial region and can constitute a diagnostic problem. The conditions that mimic CHH exhibit sufficient clinical differences with the former and should be distinguished based on specific radiographic, clinical, and histopathological findings.

The prime objective of treatment is the establishment of a new mandibular angle with near-normal values and corresponding to the contralateral side. Treatment contemplation begins when the physiological growth ceases, and cosmetic considerations take priority. CHH is associated with a good prognosis and stabilizes at the end of adolescence. Other surgical procedures such as orthognathic surgeries, soft-tissue debulking, and cosmetic reconstruction such as facelift involve extensive maneuvers and multiple procedures. In cases with significant occlusal cant and mid-face asymmetry, one should treat them with single or multistage osteotomies before proceeding with EMCAO.[10]

Prominent mandibular angle is not a unique problem of mandibular angle but a complex problem of harmony of the midfacial bone, masseter muscle, and whole mandibular contour. We generally evaluate the patient’s middle and lower facial contour as a whole preoperatively. Ostectomy of the mandibular angle adapts to purely square lower face. To the patients with wider midfacial width caused by protrusion of the zygomatic complex, reduction malarplasty is needed.[11]

Back et al. introduced that the mandibular angle ostectomy with an oscillating saw has been a standard procedure for the treatment of prominent mandibular angle since then.[12] Past two decades saw the rise of various modifications of these techniques.[5,12] Mandibuloplasty prevails in Eastern Asian countries during these years. There are several surgical techniques of mandibuloplasty, for example, ostectomy of the lateral cortex around the mandibular angle,[13] angle-splitting ostectomy,[14,15] sagittal split ramus ostectomy,[16] and one-stage or multistage osteotomy of the mandibular angle.[7,11] These techniques had their own applications, and all achieved excellent aesthetic results. There were also drawbacks among these methods. Multistage osteotomy of the mandibular angle and angle-splitting ostectomy required a high level of skill and were time-consuming. Rigid intermaxillary fixation was maintained for 2 weeks using sagittal split ramus ostectomy, and it was not convenient for postoperative everyday life. Although the procedures provide relatively satisfactory results, narrow operating field and limited range of movements of the oscillating saw have proved to be the real obstacle. To overcome the anticipated drawbacks and eliminate multiple procedures, we performed a mandibular corpus angle ostectomy using an oscillating saw, contra-angle handpiece, and curved osteotomes.[13,17]

The other variations of EMCAO include full-thickness marginal ostectomy of the mandibular corpus angle followed by corticectomy, intraoral curved ostectomy of the angle by continuous drilling, and chiseling, V-line ostectomy combined with outer cortex ostectomy, and endoscopic-guided procedures.

With single-stage EMCAO, we achieved an en bloc resection from the angle to the symphysis in a relatively short time with...
smooth ostectomy borders. An endoscope is always an adjunct to improve and increase visualization.[4,17]

**Conclusion**

Single-stage facial asymmetry correction with resultant desirable esthetic achievement by EMCAO with the modifications in armamentarium is possible and is a feasible alternative to multiple, extensive procedures.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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