



Combined Maxillomandibular Distraction for Correction of Facial Asymmetry Secondary to Condylar Fracture: A Case Report

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Abstract

Face is a channel of identity. Facial asymmetry is not only bothersome to the patient but also challenging to treat for the surgeon. Identifying the cause, understanding patients concern forms an important aspect in the treatment of facial asymmetry. The present case report highlights how an untreated condylar fracture in the childhood can lead to facial asymmetry. Two stage repair was planned for the patient. First stage-simultaneous maxillomandibular distraction for correction of occlusal cant and lengthening of right ramus of mandible; second stage-genioplasty to correct the deviated chin. This method used for correction of facial asymmetry gives acceptable results.

Keywords: Simultaneous maxillomandibular distraction; Facial asymmetry; Molina technique

Introduction

Facial asymmetry means altered balance between the right and left sides of the face. It can be an aesthetic or a functional concern sometimes both. Understanding patients' desires and expectations is critical in treatment planning.

One of the various causative factors of facial asymmetry is secondary to condylar trauma. Condylar fracture in growing children can cause disturbed mandibular growth. In majority of the cases, growth and remodeling maintain the symmetry of the mandible. However, in children older than 10 years, progressive asymmetry can result [1]. Management of pediatric fractures is predominantly conservative owing to their remodeling potential. Proper treatment planning based on fracture type and patient's growth status is required to avoid future complications [2].

The current case report describes treatment using simultaneous maxillomandibular distraction for correction of facial asymmetry secondary to condylar fracture. Simultaneous maxillomandibular distraction is an extension of distraction osteogenesis for mandibular lengthening described by McCarthy. This procedure utilizes the traction principle for the growth of the mandibular ramus. Maxilla follows the mandible during distraction with intermaxillary fixation *in situ*.

Case Presentation

A 17-year-old male reported to the department of maxillofacial surgery with a chief complaint of facial asymmetry. The patient gives a history of fall from a bicycle when he was 11 years old following which his parents noticed gradually progressing facial asymmetry along with a mild decrease in mouth opening. On extraoral examination, gross facial asymmetry was evident with fullness on the right side and elongation on the left side, chin deviated towards the right. An increase in canthus-left commissure distance was evident on the left side. Profile view examination revealed a convex profile with an obtuse chin-throat angle. Occlusal cant was seen deviating towards the left. The mouth opening was 30 mm. On intraoral examination, there was a class 2 molar relation on the right side and a class 1 molar relation on the left side.

Investigations

Orthopantomogram showed flattening of the right condylar head and shortened ramus on the right side with the tipping of lower anterior roots towards the right. Preoperative Posterior-anterior cephalogram showed Menton deviation towards the left and decreased Condylion-Antegonial point (Co-Ag) length on the right side. Preoperative CT shows a flattened condylar head on the right side with increased width suggestive of remodeling after dislocation of the condylar head post-trauma.

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Figure 1: Preoperative extraoral view.



Figure 4: PA view post-maxillomandibular distraction showing increased Ramus height on right side.



Figure 2: Immediate OPG with distractor placement and non-rigid fixation on right side of maxilla.



Figure 5: PA view post-genioplasty. Improved facial asymmetry.



Figure 3: Preoperative PA cephalogram.



Figure 6: Post second stage surgery extra oral view.

Based on the findings and patient concerns, a treatment plan was devised: simultaneous maxillomandibular distraction followed by sliding genioplasty for residual deformity as second-stage surgery.

Surgical technique

The patient was put under general anesthesia with nasotracheal intubation. Right ramus osteotomy cut was given anterior-posteriorly above the level of lingula through an extra oral post-ramal incision. A stainless steel 25 mm ramus distractor was placed and secured with screws on either side of osteotomy. Through a subcutaneous nick flexible port for distraction was brought extra orally. Following this, an intraoral incision was given in the maxillary vestibule. A procedure for modified Lefort osteotomy cut through third molar extraction sockets bilaterally (Tidemann and Trimble et al. modification) was

carried out with down fracture of the maxilla. Non-rigid fixation using 3-26-gauge braided wires was done on the left side.

Distraction protocol

Post-surgery, after a latency period of 5 days the patient was put in Intermaxillary Fixation (IMF) using elastics and an upper lower Erich arch bar placed preoperatively. Distraction was initiated - 0.5 mm twice daily that is 1 mm/day distraction was done for 16 days. IMF was left in situ for 6 weeks for consolidation.

Second-stage surgery

Following the consolidation period patient was posted for a second-stage surgery. A sliding genioplasty and distractor removal were then performed to correct the residual chin deformity.

Discussion

Management of facial asymmetry is indicated for aesthetic and functional reasons. From a surgical point of view, Choi et al. have classified facial asymmetry according to the vector of asymmetry into Horizontal asymmetry with chin deviation, vertical asymmetry with occlusal cant and a mixture of both [3]. In the current scenario, the patient presented with both chin deviation and occlusal cant. Hence the aim of surgery was to correct horizontal and vertical components of asymmetry without causing the occlusal discrepancy.

Various osteotomies for the correction of facial asymmetry secondary to trauma are available in the literature. The traditionally used method is orthognathic surgery. In case of vertical asymmetry of the mandible, bilateral sagittal split osteotomy will not provide adequate correction of angle. For this reason, oblique intraoral vertical ramus osteotomy can be performed such that the angle is a part of the distal segment which can be rotated to achieve adequate correction of roll [4]. There exists a possibility of proximal segment flaring in ramus osteotomies after correction of asymmetry [5]. Modified L-shaped osteotomy with or without distraction can be used to increase the height of the ramus [6]. All the osteotomy techniques described require a Lefort-1 osteotomy to obtain a correction of occlusal cant.

Salins et al described Orthomorphic osteotomy for the correction of facial asymmetry. However, when occlusal cant correction is required, orthognathic surgery should be performed first followed by orthomorphic osteotomy for residual deformity [7]. The long-term results following orthomorphic osteotomy are yet to be studied.

Limitations of osteotomies are the need for bone graft and a possible second surgical site, soft tissue envelope restricting the extent of correction. These factors contribute to long-term stability causing relapse. Distraction osteogenesis can be used to overcome these limitations.

Distraction osteogenesis for the treatment of facial asymmetry especially in cases of hemifacial microsomia is largely followed. The advantage of using simultaneous maxillomandibular distraction is it avoids occlusal discrepancy caused by using distraction in a single jaw. Distraction osteogenesis causes simultaneous expansion of soft tissue envelope in contrast to osteotomy [8].

In the original technique described by Ortiz Monasterio et al. in 1997 [9], maxillary Lefort down fracture and mandibular ramus osteotomy were done with inter-maxillary fixation during distraction and consolidation. Plaza et al. modified this technique by avoiding down fracture of the maxilla to prevent bony ankylosis [8]. In the current case report, non-rigid fixation of bone was done on the unaffected side to avoid lengthening of the maxilla on the unaffected side.

After the required distraction of the maxillomandibular complex, minor chin discrepancies can be corrected with a genioplasty [10]. There is a significant change in the occlusal cant, length of the ramus, canthus and commissure distance in the current case report with simultaneous maxillomandibular distraction followed by sliding genioplasty.

Disadvantages of this procedure include requiring longer hospital stays, patient compliance for treatment being of utmost importance, failure of the distractor device, and problems with a vector of distraction.

Conclusion

Weighing the risks and benefits of each technique, the best suitable procedure to meet the patient's requirements should be used. With the advent of virtual surgical planning, a proper vector extent of distraction can be planned to obtain predictable outcomes. Simultaneous maxillomandibular distraction is a proven technique for the correction of facial asymmetry with favorable results.

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