CASE REPORT

Premaxillary Osteotomy and Fixation in Bilateral Cleft Lip and Palate: A Case Report

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ABSTRACT

In the bilateral cleft lip and palate patients, usually the premaxilla is the most commonly deformed, severely rotated to right or left side with downward displacement along with severe protrusion in some cases. In such cases, osteotomy of premaxilla is one of the options to reposition premaxilla to its normal position. In this case report, we are documenting a technique for repositioning and fixation of the premaxilla to vomerine bone after performing osteotomy and ostectomy of vomerine bone without damaging erupted and unerupted teeth. The osteotomy and ostectomy of premaxilla from bony nasal septum was performed under general anaesthesia alongwith fixation of premaxillary segment to the vomer bone with low profile miniplate. This technique was performed in one patient, who had undergone repair of bilateral cleft lip previously. There was no associated complication after premaxillary osteotomy was observed in this case. In the protruding premaxilla, ostectomy, osteotomy, and fixation of protruding premaxilla with miniplate to the vomer bone yielded satisfactory result without damaging the adjacent vital structures.

Keywords: Internal fixation, premaxillary osteotomy, stabilization of premaxilla, vomer bone,

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INTRODUCTION

In bilateral cleft lip and palate patients, the premaxilla is sometimes severely protruded and rotated to right or left side with downward displacement[1]. This abnormal position of the premaxilla results in a markedly widened alveolar cleft, making surgical reconstruction and subsequent orthodontic management particularly challenging[2]. In such cases, surgical repositioning of the premaxilla becomes necessary to restore proper maxillary alignment and facilitate functional and aesthetic rehabilitation. Premaxillary osteotomy, followed by controlled repositioning and stabilization, is a well-established approach for managing these deformities. The premaxilla can be repositioned posteriorly and superiorly between the two lateral maxillary segments by performing an osteotomy, alongwith selective removal of a portion of the vomerine bone using a saw or chisel and mallet. The extent of bone that has to be removed, can be assessed by using prediction analysis on orthopantomogram and lateral cephalometric radiographs[3].

Several techniques and fixation devices have been described in literature for stabilizing the osteotomized premaxilla. These include internal fixation with miniplates[4] secured to the adjacent lateral maxillary segments without ostectomy, transosseous fixation using Kirschner wires placed between the maxillary central incisors, and posterosuperior repositioning of the premaxilla between the lateral segments combined with placement of a cortical bone graft secured with miniscrews across the alveolar cleft. Despite their effectiveness, these techniques are associated with notable complications, including damage to permanent tooth buds, injury to tooth roots, and loss of alveolar bone[5]. Such complications may have a profound impact on dental development, resulting in malalignment, compromised occlusion, and even loss of permanent teeth due to insufficient bony support.

Patients with cleft lip and palate often already exhibit dental anomalies, including hypodontia, malformed teeth, or ectopic eruption. Therefore, further

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compromise of sound teeth or developing tooth buds during surgical fixation can significantly worsen long-term dental outcomes. To minimize these risks, we present a case of a 15-year-old boy with a severely protruding premaxilla associated with bilateral cleft lip and palate, managed by premaxillary osteotomy combined with selective ostectomy of the vomerine bone and rigid fixation of the premaxilla to the vomer using a low-profile titanium miniplate. This approach allows stable posterosuperior repositioning of the premaxilla while avoiding fixation to the lateral maxillary segments, thereby reducing the risk of damage to erupted and unerupted teeth and preserving alveolar bone integrity.

CASE REPORT

A 15-year-old boy with a history of bilateral complete cleft lip and alveolus associated with cleft palate presented to the outpatient department with severe protrusion and inferior displacement of the premaxilla. He was born with a bilateral complete cleft lip and palate to parents with a first degree consanguineous marriage. There was no reported family history of cleft lip, cleft palate, or other craniofacial anomalies among siblings and first- or second-degree relatives. Primary lip repair was performed during infancy at another center, however, bilateral alveolar clefts remained unrepaired. At the age of 10 years, the patient underwent secondary lip revision at our institution for correction of a whistling deformity. Despite previous surgical interventions, the premaxilla remained markedly protruded and malpositioned, resulting in lip incompetence, widened alveolar clefts, and associated functional and aesthetic concerns, necessitating further surgical management. On examination, patient had lip incompetency, with protrusion and downward displacement of premaxilla, wide unrepaired bilateral alveolar clefts and oronasal fistula between incisors and canine (Figure 1).

Fig. 1: Pre-Operative Frontal and Lateral Views

After approval from IRB (Ref: AWS/2023/1214), the procedure was performed under general anaesthesia. Pre-operative consent, clinical photographs, and radiographic evaluation with orthopantomograph (Figure 2), and intraoral occlusal view was performed. The amount of ostectomy was decided preoperatively on clinical examination and by prediction tracing on occlusal view.

After oral intubation, local anaesthesia 2% lidocaine with 1:100000 adrenaline was infiltrated in the mucoperiosteum of premaxilla. The mucoperiosteum over the stalk of premaxillary was elevated properly and underlying bone was exposed. That bone was scored with the help of a fissure bur in piezoelectric surgical hand-piece. This block of the bone was measured and 12 mm was removed from this stalk (Figure 3). Care was taken to avoid injury of the nasal mucosa.

Fig. 2: Pre-Operative Orthopantomogram

Fig. 3: Intra-Operative Bone Removal

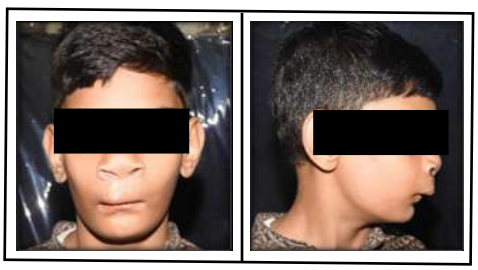

Fig. 4: Post-Operative Frontal And Lateral Views

Fig. 5: Post-Operative Occlusal View

After ostectomy and osteotomy, the premaxilla was repositioned manually, superiorly and posteriorly. After repositioning, premaxilla was fixed with a four-hole titanium L-shaped miniplate. Plate was fixed with bicortical screws with one screw in each hole. Closure of oronasal fistula was also performed. The mucoperiosteum was sutured back with 4–0 absorbable sutures. We followed the patient for one year and found him doing well without any complications. (Figure 4). After one year, an occlusal view was taken to assess the bony union (Figure 5).

DISCUSSION

Congenital clefts of the lip and/or palate are among the most common congenital craniofacial deformity. Patients born with bilateral cleft lip and palate have premaxillary protrusion and jaw deformities causing malposition of premaxilla and lateral bony segments. Before bone grafting, patients can be treated with orthodontics, premaxillary osteotomy[6] and Distraction osteogenesis[7], to decrease alveolar cleft gap and alignment of premaxilla with lateral bony segments. The minimum age described for premaxillary osteotomy is 8 years, so that normal maxillary growth is minimally interrupted.

Premaxillary osteotomy can be fixed with Kirschner wire[8], occlusal splints[9] cemented to maxillary arch, and direct interdental wiring[10]. Surgeons face problems with these fixation methods, such as, inadequate position[11], inadequate stability, tipping, malunion[12] and loss of premaxilla due to poor perfusion and damage to permanent tooth buds[13].

In this article, we presented a technique to reposition and premaxilla fixation with miniplate after performing osteotomy and ostectomy of vomerine bone. The miniplate fixation for premaxillary osteotomy has been described by Carlini et al[14], but the technique that we used has difference of repositioning and fixation of premaxilla posterosuperiorly to the vomerian bone, and lateral segment of the maxilla are spared so that damage to permanent unerupted tooth buds is avoided. To prevent tipping and mobility of premaxilla, we removed the part of vomerine stalk and fixed it with the miniplate so that good union of bony segments can be achieved. Although the cost of plate is high but good results can be achieved with this technique.

CONCLUSION

Premaxillary osteotomy followed by rigid fixation of the premaxilla to the vomer using a miniplate, provides a stable and effective method for correcting severe premaxillary protrusion in patients with bilateral cleft lip and palate. In the present case, this technique resulted in satisfactory posterosuperior repositioning of the premaxilla, good bony union, and an uneventful postoperative course without dental, vascular, or soft-tissue complications. By avoiding fixation to the lateral maxillary segments, the risk of damage to erupted and unerupted teeth is minimized, thereby preserving alveolar bone and dental structures. This approach offers a reliable surgical option and expands the armamentarium of cleft surgeons for managing complex premaxillary deformities in selected patients.

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