

## Rehabilitation of cleft with nasoalveolar molding- A case report

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### ABSTRACT

Facial cleft is the second most common congenital deformity. Problems of cleft can be related to esthetic, phonetics, functional insufficiency, emotional, psychological and social. Significant abnormality in nasal cartilage morphology and asymmetry of alar base and columella are associated with cleft lip and alveolar deformity. Pre Nasoalveolar molding (PNAM) is a nonsurgical method of reshaping the gums, lip and nostrils before cleft lip and palate surgery, which decrease the severity of the cleft. A 05 days old unilateral cleft lip and palate child was referred by plastic and reconstructive surgeon for presurgical management. Child was having unilateral cleft of lip, alveolus and palate of left side with shorter columella on cleft side with gap between alveolus of 10 mm. The alar cartilage of left side was depressed and there was the deviation of columella towards the right side. Presurgical nasoalveolar molding was planned for the child. Once the child was adapted and was able to easily suckle without gagging, the activation of the appliance was done. After 06 weeks nasal component was added to the appliance. The goals of PNAM in the unilateral child are to align and approximate the intraoral alveolar segments and to correct the malposition of the nasal cartilages.

**Keywords:** PNAM, Molding, Cleft

### INTRODUCTION

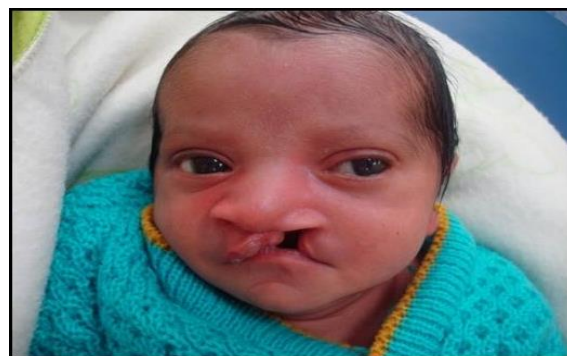
Facial cleft is the second most common congenital deformity. 01 in 750 births is affected with it. Problems of cleft can be related to esthetic, phonetics, functional insufficiency, emotional, psychological and social [1]. Cleft lip and alveolar deformity are associated with abnormality in nasal cartilage morphology and asymmetry of alar base and columella[2]. A particular challenge to surgeons is the correction of the deficient columella and the deformity of the nasal cartilages with acceptable esthetics. The nasoalveolar molding has resulted in long-term benefits to the child.

Pre Nasoalveolar molding (PNAM) is a nonsurgical method of reshaping and decreasing the severity of the gums, lip and nostrils before cleft lip and palate surgery is performed. This treatment involves the active molding, repositioning of the deformed nasal cartilages and alveolar processes, as well as the lengthening of the deficient columella [3].

### CASE REPORT

A 05 days old child was referred by plastic and reconstructive surgeon to the dental centre for pre-surgical management of unilateral cleft lip and palate of left side. Examination revealed that the child was having unilateral cleft of lip, alveolus and palate of left side with shorter columella on cleft side (Fig 1). Gap between the major and minor segments of alveolus was 10 mm. The alar cartilage of left side was depressed and there was the deviation of

columella towards the right side. On the basis of clinical findings a diagnosis of Veau Type III cleft lip and palate was made.



**Fig 1: Extraoral view showing the cleft lip and alveolus**



**Fig 2: Showing the impression making with putty and patient's head upside down**



**Fig. 3: Showing the appliance in mouth retained with adhesive and anchorage tapes**



**Fig. 4: Showing the nasal component added to appliance for alar fullness**

### OBJECTIVES OF TREATMENT

The main objective of the treatment is stimulation and to redirect the growth of alveolus to get the approximation. To achieve this, patient is treated with molding appliance to generate the traction force across the cleft lip followed by a nasal component. Nasal and alveolar symmetry and correction of nasal tip projection can be achieved with nasal stent and alveolar molding plate.

Pre-surgical nasoalveolar molding was planned for the child. A putty impression was made in the customized tray of the child with head upside down in presence of surgeon to avoid any aspiration of material (Fig 2). Two casts were made. One for record purpose and second as working cast. All the defect areas of alveolus and palate were blocked with plaster of paris to form the normal contour of palate. Wax up was done to form a palatal plate and for retentive buttons. In the conventional manner the acrylization was done. After finishing and polishing the retentive buttons were secured at the labial flange at an angle of 45° to the occlusal plane as it does not cause any interference in lip closure and it also neutralizes the vector of forces.

The palatal plate was inserted in child's mouth and retention of appliance was checked. Any over extension or sharp edges were removed. The palatal plate was secured in child's mouth with orthodontic elastics and adhesive tape (Steristrip, 3M). To give more retention to the prosthesis, an anchorage tape was also placed (Fig 3). Parents of the child were told to change the adhesive tape after every 2-3 hours and anchorage tape once in a day. The appliance was inserted in child's mouth for 2 days. Once the child was adapted and was able to easily suckle without gagging, the activation of the appliance was done. The aim of activation was to align the major and minor segments of alveolus so that the surgeon gives minimum tension to the flap while closure. To activate the appliance the acrylic was trimmed from the outer surface of minor segment and inner surface of major segment and soft tissue reliner was added on inner surface of minor segment and outer surface of major segment. This activation was done once in a week. Distance between major and minor segment became 05 mm and they became well aligned in 06 weeks of activation. After this the nasal component to the appliance was added. A wire was bent into swan neck shape and self cure resin was added on the head and it was attached to the labial flange. The head was covered with layer of soft tissue reliner and it was inserted gently in left ala of nose (Fig 4). The layer of reliner was added every week till the time the fullness in alar cartilage came. Once it was done the child was operated by plastic and reconstructive surgeon for lip closure surgery and esthetic and functional result was obtained.

### DISCUSSION

McNiel (1950) introduced PSIO (pre-surgical infant orthopedics) and in 1990 Barry H Grayson at the institute of reconstructive plastic surgery at New York University developed Pre-surgical nasoalveolar molding (PNAM) therapy.

The goals of PNAM in the unilateral child are to align and approximate the intraoral alveolar segments and to correct the malposition of the nasal cartilages [2]. The effect of pre-surgical orthopedics on facial growth has long been of concern and the subject of much clinical research [4]. According to Ross there is no difference that occurs in facial growth between cleft child treated with or without pre-surgical orthopedics.

Improved long-term nasal esthetics, reduced number of nasal surgical procedures, reduced need for secondary alveolar bone grafts in the majority of patients are the main advantages of PNAM [5]. PNAM should be started soon after birth as with age because of transmitted estrogen from the mother to child and presence of hyaluronic acid. As the age progress, plasticity of both hard & soft tissue reduces and so the compliance of patient decreases. Other

limitations include frequent visits to the hospital failing which may lead to locked segments of alveolus, exposure of deciduous tooth, nostril overexpansion.

### **CONCLUSION**

Prosthetic therapy not only aids in developing normal speech, and promoting deglutition but makes child physically, psychologically and socially more confident. A small step like NAM in such cases leaps and bounces to successful results and can be beneficial to child. Therefore not only plastic surgeons but prosthodontic role should also be considered and a multidisciplinary approach is required. So the lost health and smile of the child should be restored to the maximum with all the efforts.

### **REFERENCES**

1. Milerad, J, et al. associated malformations in infants with cleft lip and palate: a prospective, population-based study. *Pediatrics* 1997; 100:180.
2. Cutting CB, Grayson BH, Brecht L, Santiago P, Wood R, Kwon S. Presurgical columellar elongation and primary retrograde nasal reconstruction in one stage bilateral cleft lip and nose repair. *Plast Reconstr Surg.* 1998;101:630–39
3. Grayson BH, Cutting CB, Wood R. Preoperative columella lengthening in bilateral cleft lip and palate. *Plast Reconstr Surg.* 1993;92:1422–23.
4. Ross RB. Treatment variables affecting facial growth in complete unilateral cleft lip and palate. Part II. Presurgical orthopaedics. *Cleft Palate Craniofac J.* 1987;24:24–32.
5. Millard DR, Latham RA. Improved primary surgical and dental treatment of clefts. *Plast Reconstr Surg.* 1990;86:856–71.