



## IMPORTANCE OF PRESURGICAL NASOALVEOLAR MOLDING IN CLEFT PATIENT- A CASE REPORT

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**ABSTRACT** Presurgical nasoalveolar molding (PNAM) is a presurgical infant orthopedic procedure that attempts to target the nasal deformity leading to a more esthetic surgical repair. It is the nonsurgical, passive method of bringing the gum and lip together by redirecting the forces of natural growth. This clinical report presents a case of child with complete unilateral cleft lip and palate who has undergone Presurgical nasoalveolar molding. The purpose of this article is to highlight the role of nasoalveolar molding in improving the anatomic relationship between the structures affected by cleft deformity.

### KEYWORDS :

#### INTRODUCTION

Cleft of the lip, alveolus and palate (CLAP) are the most common congenital mal-formations of the head and neck. Children of cleft lip and/or palate are at risk for psychosocial problems due to multiple associated factors like speech problem and facial appearance, which in turn may create adverse reactions from others further resulting in issues with self esteem and emotional development of a child<sup>1</sup>. The management of cleft patients should be approached as a multidisciplinary team which has evolved dramatically in recent years because of advanced surgical techniques. However, persistent problems with associated nasal deformities have given rise to the use of presurgical nasoalveolar molding (PNAM) in cleft-treatment protocols. The theory of PNAM treatment is based on Matsuo's research that the nasal cartilage is still developing and is subject to repositioning within the first 6 weeks of life (Matsuo and Hirose, 1991)<sup>2</sup>. Grayson et al. (1999)<sup>3</sup> described the first treatment protocol for PNAM. The objectives of this technique are to actively mold and reposition the deformed nasal cartilages and alveolar processes and to lengthen the deficient columella in the neonatal period, prior to the primary lip and nasal surgery.

#### CASE REPORT

A five days old baby with cleft lip and palate on right side was referred to the clinic for feeding appliance. She had wide nostril base, increased alar rim, oblique columella and nasal septum deviated on left side. Nasoalveolar molding therapy was planned after discussion with the paediatrician and plastic surgeon. Parents were counselled about the treatment procedure and its need.

Impression of cleft was made in hospital setup in presence of paediatrician and anesthetist to handle any airway emergency. Impression was made using heavy bodied silicone impression material in acrylic impression tray. The baby was awake and held in prone position in mother's lap with head facing downward and mother's hands supporting baby's chest and lap region while making the impression. Once the impression material was set, the tray was removed and the mouth was examined for any residual impression material (Fig.1). Impression was poured in dental stone and molding plate of self cured clear acrylic was fabricated on it. Nasal stent was made by incorporating round stainless steel wire with acrylic button, into the plate (Fig. 2). In this patient molding plate was modified as U loop was added to nasal stent and plate was without retentive buttons as the loop added to the stent would give some retention to the plate<sup>4</sup>.



Fig 1. Impression



Fig 2. Nasoalveolar molding appliance

Margins of plate were properly rounded off and finished to reduce chances of mucosal irritation. Approximately 5-mm diameter hole was made in the centre of the acrylic palatal vault to provide an airway in the event that the posterior border of the plate drops down onto the tongue.

Moulding plate was inserted into infant's mouth and was observed for several minutes to check the stability of the appliance in place against the palate. Bottle feeding was done to ensure proper suckling without gagging. As parents were little apprehensive about stability of plate, elastics were engaged on the stent wire without applying any pressure and was secured to bandages over cheek (Fig.3)



Fig. 3 Appliance placed

Instructions were given to parents regarding insertion and removal of appliance. They were instructed to remove it atleast once everyday for cleaning and to examine mouth regularly for any ulcerations.

The patient was reviewed every week. Selective removal of hard acrylic and addition of soft denture liners were done to approximate alveolar segment and to improve nostrils shape and ala form. Care must be taken to prevent the soft denture material from building up on the height of the alveolar crest as this will prevent complete seating of the molding plate.<sup>5</sup>

At the end of nasoalveolar molding for three months, there was decrease in inter segmental distance, Bi alar width and nostril width (Fig. 4a,b)



Fig 4a Pre NAM

Fig 4b Post NAM

Fig 4(a,b) Nasal molding by increased columella length and improved nostril form is evident in submental view pre and post PMA

#### DISCUSSION

The facial deformities due to cleft lip and palate, if not treated at appropriate time may lead to severe facial mutilation, growth

disturbances of maxilla and functional defect of teeth. Nasal deformity in infants with nasolabial clefts persists if it is not actively corrected<sup>6</sup>. The principle objective of presurgical nasoalveolar molding (PNAM) is to reduce initial cleft deformity by reshaping the nasal cartilage and mold the maxillary arch before cleft lip repair and primary rhinoplasty<sup>7</sup>. The temporary plasticity of nasal cartilage in the neonatal period is believed to be caused by high levels of hyaluronic acid, a component of the proteoglycan intercellular matrix, found circulating in the infant for several weeks after birth. Figueroa suggested the addition of nasal stent to the intra oral molding plate in the first appointment itself without waiting for the cleft alveolus to get reduced to less than 5mm as been suggested by Grayson so as to use the molding potential of the nasal cartilage without further delay<sup>4</sup>.

PNAM aims to align intraoral alveolar segments and correct the nasal tip, the alar base, the philtrum, and the columella<sup>8</sup>. With the alveolar segments in a better position and increased bony bridges across the cleft, the permanent teeth also have a better chance of eruption in a good position with adequate periodontal support. Lee *et al.* demonstrated that midfacial growth in the saggital and vertical plane was not affected by NAM and gingivoperiosteoplasty<sup>9</sup>. As cleft deformity is reduced in size before surgery, there is less post surgical scar, improved esthetics and reduce need for multiple surgeries for nasal and labial deformities.<sup>4</sup>

## CONCLUSION

Nasoalveolar molding can be effective adjunctive therapy for reducing hard and soft tissue cleft deformity before surgery. It can also prove to be a cost-effective technique by reducing number of future surgeries in cleft patients. However parents play an important role in determining the clinical outcome so their proper training, education and support is very crucial.

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