

## Management of Complete Unilateral Cleft Lip and Palate Patient with Modified Presurgical Nasoalveolar Molding: A Case Report

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### ABSTRACT:

Nasal reconstruction for patients with cleft lip and palate is a challenging job for the surgeon. There have been numerous techniques documented to improve the position of the cleft alveolar segments only, despite the fact that the cleft nasal deformity remains the greatest aesthetic challenge. Nasoalveolar Molding is used effectively to reshape the nasal cartilage and to mold the maxillary arch before cleft lip repair. This clinical report presents a case of child with complete unilateral cleft lip and palate who was treated with Modified Pre surgical Nasoalveolar Molding Technique, five months prior to surgery. The purpose of this article is to highlight the effectiveness of Modified Presurgical Nasoalveolar Molding Technique, used to direct growth of the alveolar ridge, lips, and nose in the pre surgical treatment of cleft lip and palate.

**Keywords:** Cleft lip, Cleft palate, PNAM.

### INTRODUCTION

The most common congenital mal-formations are Cleft of the lip, alveolus and palate (CLAP). Approximately in India, out of 24.5 million births per year - the birth prevalence of clefts is amid 27,000 and 33,000 clefts.<sup>1</sup>

Grayson and Cutting combined the concept of presurgical orthopaedics and presurgical treatment of the cleft lip nasal deformity and developed the concepts of Presurgical Nasoalveolar Moulding, which combined a nasal molding stent with a passive, presurgical molding appliance in treating cleft lip and palate infants in 1988.<sup>2</sup>

The primary aim of pre-surgical nasoalveolar moulding (PNAM) is reduction in soft-tissue and cartilaginous deformity to facilitate surgical soft-tissue repair in optimal conditions under minimal tension to minimize scar formation.<sup>3,4</sup>

Pre-surgical Nasoalveolar Molding (PNAM) has become one of the important component in the management of cleft lip and palate (CLAP) as it solves most of the problems associated

with CLAP. PNAM aids in alignment and approximation of the alveolar cleft segments, to correct the malposition of the nasal cartilage and reduce soft tissue deformity by correcting the nasal tip, alar base and the position of philtrum and columella. PNAM produces an overall improvement in the aesthetics of the nasolabial complex in cleft patients, while minimizing the extent of the surgery and the overall number of further surgical procedures. This clinical report describes Figueroa Modified PNAM Technique for an infant with complete unilateral cleft lip, palate and alveolus, showing significant reduction in cleft defect size and improved anatomy and topography of deformed surrounding soft tissues.

### CASE REPORT

A two days old baby with unilateral cleft lip and palate was referred to our dental institute for feeding appliance (Figure 1a). After a thorough evaluation Nasoalveolar Molding

Therapy was planned for the patient. The parents were counseled properly about the procedure, duration and prognosis of treatment, and their active involvement during

the PNAM process was explained. The infant was evaluated thoroughly by the pediatrician and the plastic surgeon.

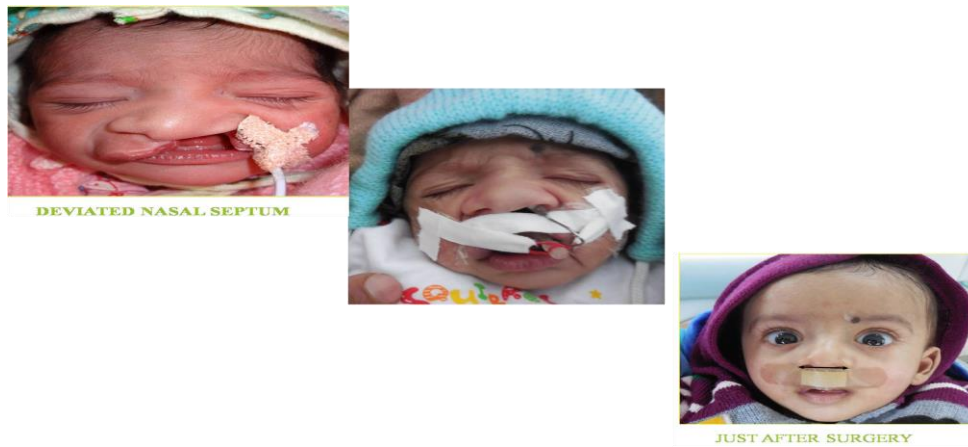


Figure 1: Frontal View of the patient;(a) Before molding. (b) With appliance. (c) After lip surgery.

At one week after birth an impression of the intraoral cleft defect was made by using an elastomeric material in an infants acrylic impression tray in the presence of anesthetist and necessary armamentarium to manage the emergency.

While making impression, baby was fully conscious and kept in mother lap with head facing downward and her hands supporting baby's chest and lap region to avoid any aspiration of liquid or impression material.

In the cleft region of the cast, undercuts were blocked out with utility wax. The molding appliance was then fabricated with self cure hard clear acrylic resin. Retentive button was fabricated with same material and placed in the antero-inferior cleft region of the molding plate at an angle of 45° to the imaginary occlusal plane. Bilobed Nasal stent with a projection of acrylic supported by round stainless steel wire of 0.036-gauge in shape of swan neck, was attached to the plate.

Before delivering the plate, the lip segments were approximated by applying micro pore tape. Base tape, a hydrocolloid type bandage, was placed over the cheeks. It serves as a barrier between the retention tapes and the cheeks to minimize tissue irritation.

A well finished and polished molding plate was inserted into the infants mouth. Small

orthodontic elastics of (0.25 inch diameter) were added into the loops of adhesive tapes (0.25 X 4 inch). The elastics were placed over the retentive button, and the adhesive tape was pulled and secured to the base tape on the infant's cheek. The elastics were pulled approximately twice their resting diameter. The activation force can vary depending on the stage of the treatment and the clinical judgment. Nasal stent was inserted passively into the nostril and covered with a thin veneer of soft acrylic to apply positive elastic pressure (Figure 1b). This pressure aids to lift the collapsed nostril and in molding the nasal tissue. During follow up visits the molding plate as well nasal stent was modified by serial addition and subtraction of soft acrylic to get the desired shape of nostril, ala form and to approximate the alveolar segment in a desired anatomy.

The plate was activated by selective removal of hard acrylic from the region where the movement of bone was needed, at the same time soft denture liner was incorporated in the region where bone is required to be moved to close the cleft defect. The patient was evaluated at interval of 2 or 3 weeks and the appliance was activated as per requirement.

At the end of nasoalveolar molding there was reduction in the alveolar cleft from 15mm to

1.5mm, the columella was lengthened and repositioned from an oblique position into an upright position, which resulted in improved nasal alar cartilage symmetry. The contour of the nostril on the cleft side resembles the nostril on the unaffected side. (Figure 1c, 2, 3b).

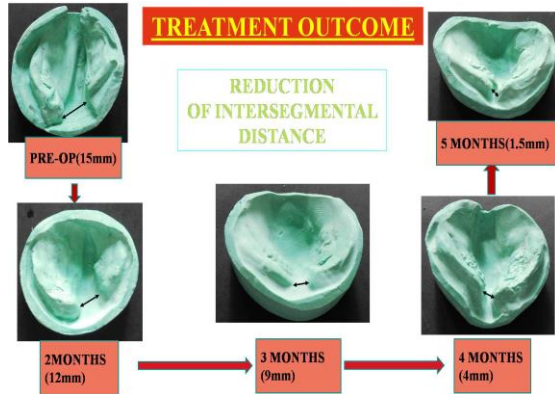


Figure 2: Progressive changes in the models



Figure 3: Submental View of the patient (a) Before molding (b) After lip surgery. There is Reduction in Bialar Width and Lengthening of Columella after molding

## DISCUSSION

The technique of Nasoalveolar Molding followed by us was Figueroa Modified, wherein alveolar and nasal molding are done at the same time, the rationale behind this was, the acquired maternal estrogen before birth results in decrease in elasticity and increase in plasticity of cartilages. It has been assessed by Matsuo (1984) that the temporary plasticity of nasal cartilage is believed to be caused by high levels of maternal hyaluronic acid, a component of the proteoglycan intercellular matrix, which is found circulating in the infant for several weeks after birth.<sup>5,6</sup>

At the conclusion of Figueroa Modified Nasoalveolar Molding Therapy, we observed increase in nostril height, collumelar angle and

decrease in intersegmental distance, Bi-alar width and nostril width.

## CONCLUSION

PNAM, when used prior to primary surgical lip repair, will give psychological reassurance to parents and child, enhance surgical outcome, reduce the need for revision surgeries in future and also reduces the overall cost of treatment. A well executed PNAM process by a committed team of dentist and surgeon supported by good compliance of the parents and child may prove to be a boon for CLAP child. Results of PNAM are promising for a child with CLP, hence are encouraged to be used promptly after the birth and continued till further specific corrective surgeries are performed.

## IMPORTANCE OF PNAM TO A PEDIATRIC DENTIST

1. Helps to align and approximate the alveolar cleft segments and to correct the malposition of the nasal cartilage..
2. Reduce the need for soft-tissue revision surgeries in future and the overall cost of treatment.
3. Superior post-surgical esthetic results are obtained

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