

Pre-Surgical Nasoalveolar Molding (PNAM) Therapy For The Treatment of Unilateral Complete Cleft Lip and Palate: A Case Report

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ABSTRACT

Cleft lip and cleft palate are the most common congenital malformation involving the middle third of face. The children affected with this anomaly are handicapped right from birth for breastfeeding, deglutition, improper growth and development of maxilla and overall face development affecting the total personality of the individual. Treatment of patients with a cleft lip and palate should be started as early as possible to deal with esthetic, functional, and psychological concerns. Excellent results are achieved when Nasoalveolar molding is initiated immediately after birth. In this clinical report presurgical management of an infant with a complete unilateral left sided cleft of the lip and palate is described.

KEYWORDS: Presurgical Nasoalveolar Alveolar Molding, Unilateral Cleft Lip and Palate, Post Surgical Nasal Symmetry

INTRODUCTION

The unilateral cleft defect is characterized by a wide nostril base and separated lip segments on the cleft side. The affected lower lateral nasal cartilage is displaced laterally and inferiorly resulting in a depressed dome, increased alar rim, oblique columella, and overhanging nostril apex.¹ Presurgical nasoalveolar molding (PNAM) provides the surgeon with an improved foundation to repair the defect. It reduces the size of the intraoral alveolar cleft through the molding of the bony segments, soft tissues surrounding the cleft and repositions cartilage in the cleft nose. PNAM depends on the inherent plasticity and moldability of the neonatal cartilaginous tissues. So, it provides excellent results when started early after birth.²

CASE REPORT

A one day old male infant with unilateral cleft lip and palate was referred to our dental institute for feeding appliance. After thorough evaluation Nasoalveolar Molding Therapy was planned for the patient. The complete procedure of PNAM, along with the recall appointment schedule was described to the parents. A general physical checkup was done by the pediatrician and the plastic surgeon, and consent was obtained from the parents to start the active molding therapy within the first week of birth. Initial examination revealed unilateral cleft lip and cleft palate on the left side (Figure 1a,1b). The distance between the two alveolar segments was 7 mm. The medical and family history of the parents was



Fig 1a &1b shows 7day old patient with unilateral cleft lip and palate of left side. There is nasal deformity on left side.

noncontributory. The initial intraoral impression was made in infants acrylic impression tray with a heavy-bodied polyvinylsiloxane impression material (Speedex; Coltene Whaledent, Mumbai) in the presence of anesthetist and necessary armamentarium to manage the emergency. Infant was on NPO(nill per oral) for two hours before impression making. While making impression, infant was awake and kept in mother's lap with his head facing downward and his chest and lap region was supported by mother's hand. The tray was removed as soon as impression material was set, and the oral cavity was examined for residual impression material. The impression was then poured with dental stone (Kalstone; Kalabhai Karson, Mumbai, India) to obtain an accurate cast. Duplicate cast was obtained from the same impression as a permanent patient record. Cleft space and undercuts were blocked on the accurate cast with wax. The molding appliance was then fabricated

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with self cure clear acrylic resin (DPI self cure-clear; Dental Products of India, Mumbai, India). Retentive button was made in the antero-inferior region of the molding plate at an angle of 30-45° to the imaginary occlusal plane. Nasal stent made of acrylic supported by round stainless steel wire of 0.036-gauge was attached to the plate (Figure 2b).

Before delivering the plate, the lip segments were approximated by applying micro pore tape. Base tape, a hydrocolloid type bandage (Tegaderm; 3M ESPE, St. Paul, MN), was placed over the cheeks and lips to avoid irritation to tissues.

With the tapes in place, the molding plate was inserted into the mouth. Loops of Steri Strips (0.25 X 4 inch) were made and orthodontic elastics (0.25 inch diameter) were incorporated to it. The elastic bands were placed over the retentive button, and the strips were pulled and secured to the base tapes on the cheeks. To obtain appropriate force, the elastics were stretched to twice their original length, and, to get proper force direction, the retentive tapes and elastics were directed posteriorly and superiorly (Figure 2a). Nasal stent was inserted passively into the nostril and covered with a thin layer of soft acrylic (Permasoft; Dentsply) to apply positive elastic pressure. This pressure aids to lift the collapsed nostril and in molding the nasal tissue.



Figure 2a shows placement of steri tapes and position of nasal stent and handle. Handle is attached at 30-45 degree to alveolar plate. Elastic secured tapes are directed superiorly and posteriorly from handle in alveolar plate towards cheek tissue. Image 2b shows PNAM plate with nasal stent.

After 1 week at the recall appointment, the plate was activated by selective addition of 0.2-0.5 mm of the soft resilient liner material on the palatal aspect of the lesser segment and buccal aspect of the greater segment and trimming on the palatal aspect of the greater segment and buccal aspect of the lesser segment. During follow up visits, the nasal stent was modified by addition of soft acrylic or bending wire with three prong plier to get the desired shape of nostril and ala form. The patient was evaluated every 15 days, and the appliance was activated as per requirement.

At the end of nasoalveolar molding, there was reduction in the alveolar cleft from 7mm to 0.5mm, the length of columella increased and its position changed from oblique to upright and had more midline orientation, which resulted in improvement in projection of nasal tip

and symmetry of alar cartilage (Figure 3a & 3b). Surgery for repair of cleft lip was performed at 4 months of age. Postsurgical pictures show that the contour of the nostril on the cleft side resembles the nostril on the unaffected side as the alar tissue was molded into a normal convex shape (Figure 3c & 3d). Success of PNAM therapy eliminating need for rhinoplasty is visible in post surgical pictures.



Figure 3a & 3b shows results of PNAM therapy in 3.5 month old infant one week before surgery. there is reduction in cleft space, increase in columellar length and reduction in bialar width. Image 3c & 3d shows 1 month post surgical results of PNAM therapy. Nasal symmetry is evident

DISCUSSION

The technique of Nasoalveolar Molding followed by us was as described by Grayson^[3], as the intersegmental distance was less than 8mm, alveolar and nasal molding were started at the same time, the rationale being the acquired maternal estrogen before birth increases hyaluronic acid which results in decrease in elasticity and increase in plasticity of cartilages.⁴ hyaluronic acid, a component of the proteoglycan intercellular matrix, is found circulating in the infant for several weeks after birth.^{5,6}

At the conclusion of Nasoalveolar Molding Therapy, nasal symmetry was achieved. There was increase in columellar length, decrease in bialar width and alar cartilages were molded to normal shape. The lip segments were closer than pretreatment and closure of alveolar gap was observed

CONCLUSION

Presurgical naso alveolar molding has emerged as promising therapy to achieve nasal symmetry by reducing bialar width, increasing height and width of columella and contouring alar cartilages thereby reducing the need for frequent surgical interventions to achieve esthetic results.

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REFERENCES

1. McComb H. Primary correction of unilateral cleft lip nasal deformity: a 10-year review. *Plast Reconstr Surg* 1985;75:791–799.
2. Taylor TD. Clinical maxillofacial prosthetics. Chicago: Quintessence; 2000. p. 63-84.
3. Grayson BH, Cutting C, Wood R. Preoperative columella lengthening in bilateral cleft lip and palate. *Plast Reconstr Surg* 1993; 92:1422-1423.
4. Hardingham TE, Muir H. The specific interaction of hyalurinic acid with cartilage proteoglicans. *Biochim Biophys Acta*. 1972;279:401–405.
5. Grayson BH, Santiago PE. Presurgical orthopedics for cleft lip and palate. In: Aston SJ, Beasley RW, Thorne CHM, eds. *Grabb and Smith's Plastic Surgery*. 5th ed. Philadelphia: Lippincott-Raven; 1997:237–244.
6. Matsuo k, Hirose T. Non surgical correction of congenital auricular deformities in early neonates, a preliminary report. *Plast Reconstr Surg* 1984; 73:38-50.

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