



PREDICTABLE FACIAL ESTHETICS BY PRESURGICAL NASOALVEOLAR MOULDING IN NEONATES - A CASE REPORT

Dr. Sweta Pattanaik	Post PG Doctor, Department of Prosthodontics, S.C.B. Dental college and hospital, Manglabag, Cuttack 753007.
Dr. Jyotirmayee Sahoo*	PG Student, Department of Prosthodontics, S.C.B. Dental college and hospital, Manglabag, Cuttack 753007. *Corresponding Author
Dr. Tapan Kumar Patro	Professor & HOD, Department of Prosthodontics, S.C.B. Dental college and hospital, Manglabag, Cuttack 753007.
Dr. Angurbala Dhal	Associate Professor, Department of Prosthodontics, S.C.B. Dental college and hospital, Manglabag, Cuttack 753007.
Dr. Lokanath Garhnayak	Associate Professor, Department of Prosthodontics, S.C.B. Dental college and hospital, Manglabag, Cuttack 753007.

ABSTRACT A Cleft is a congenital abnormal space or gap in the upper lip and palate. Although plastic surgery has made great advances in the area of cleft surgery, aesthetical corrections of the deficient columella and nasal cartilages were difficult. presurgical naso-alveolar molding (PNAM) at an early stage is used to reduce soft tissue and cartilaginous deformity. This article presents a case report of a 6-day-old baby boy with a left-sided unilateral incomplete cleft lip and palate, with no significant medical history or any associated systemic illness. He was referred with the primary need for a feeder plate. The width of the cleft was measured from the base of the alveolus on one side to the other and was approximately 7 mm. The final impression was made with a custom tray. NAM appliance was fabricated and inserted in the patient's mouth. Orthodontic wire of 21 gauzes was used for wire bending to support the acrylic forming a nasal bulb. In 2 months, the follow-up patient was recalled at 15 days intervals for 1 and a half months for activation and modification of the plate to gradually approximate the alveolar segments. After 2 months of follow-up, it was shown that the cleft palate gap was reduced to 3mm from 7mm. PNAM allows overall improvement in the aesthetics of nasolabial complex in cleft conditions and minimizes the extent and the numbers of surgery. The cleft deformity was significantly reduced in size with the NAM therapy in the present case.

KEYWORDS : Cleft lip & palate, PNAM, Naso alveolar moulding, Neonates,

INTRODUCTION

A cleft is a congenital abnormal space or gap in the upper lip, alveolus, or palate. As reported by the World Health Organization (WHO), the prevalence at birth varies worldwide, ranging from 3.4–22.9 per 10,000 births for cleft lip and palate (CL/P), and 1.3–25.3 per 10,000 births for cleft palate alone (CPO)¹. Although plastic surgery has made great advances in the area of cleft surgery, aesthetical corrections of the deficient columella and deformed nasal cartilages were difficult². As an adjunctive method, presurgical nasoalveolar moulding (PNAM) reduces soft-tissue and cartilaginous deformity. This technique facilitates surgical soft-tissue repair under minimal tension with minimum scar formation³. It takes the advantage of the malleability of immature cartilage and its ability to maintain a permanent correction form.

CASE REPORT

A 6-day-old baby boy with a facial cleft on the left side of his face was referred to our department with the primary need for a feeder plate (Fig 1). Ryles tube was inserted for feeding. Unilateral incomplete cleft lip and palate with no significant medical history, family history, or any associated systemic illness was observed. There was a deviation of the nasal septum towards the right side of the nose from the facial midline, depression of left columella, and ala of the nose. The extension of the cleft palate was partially onto the soft palate.

The size of the cleft was measured from the base of the alveolus on one side to the other and was found to be approximately 7 mm (Fig 3). According to Kriens's simple coding system for paraphrasing cleft lip and palate in 1989, the present case was classified as "...HSAL." (Fig 1)



Fig 1: Cleft lip and palate defect in baby boy (HSAL classification)

TREATMENT OBJECTIVES-

Though the patient was referred for a feeding plate, a naso-alveolar moulding (NAM) appliance was planned for non-surgical reshaping of gum, lips, and nostrils before surgery. This appliance helps in reducing the size of the cleft palate and the gap between the upper lip by active moulding and repositioning of the deformed nasal cartilages and alveolar processes and lengthening of the deficient columella⁴. It helps in the primary repair of the lip, alveolus and nose with less scar formation by lifting and narrowing the nose and facilitates the baby's feeding by closing the cleft deformity.

PROCEDURE -

The primary impression was made with polyvinylsiloxane (putty) elastomers (Fig 2) (Dentsply Aquasil putty kit, India) in the crying stage. The baby was held by his mother upside down. A custom-made clear acrylic tray (Coltene coltocure) was fabricated on the primary cast (Fig 2). The final impression was made with putty and light body (polyvinyl siloxane) elastomeric impression materials (Fig 2). The cleft region was blocked using modeling wax (Rolex modeling wax). The NAM appliance was fabricated with chemically activated polymethyl methacrylate clear acrylic resin (Fig- 4). Orthodontic wire of 21 gauzes (Smith stainless steel wire) was used for wire bending to support the acrylic, aiding in retention (Fig- 4).

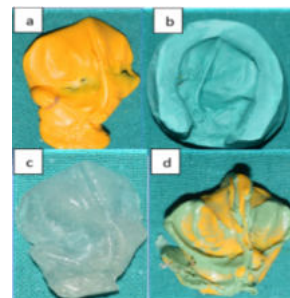


Fig 2: a,b - Primary impression and primary cast c,d - Custom tray and final impression

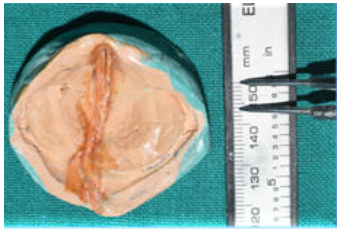


Fig 3: Master cast showing cleft size- 7mm



Fig 4: Fabrication of NAM Appliance

The appliance was finished and polished. Before placing the appliance. Lip taping was done to apposed the lips more closely with the help of tegaderm (3M Tegaderm Film, India) (Fig 5). Duo-Derm/Tegaderm spares the skin from the frequent irritation of taping. Then the NAM appliance was placed intraorally and maintained in the position with a surgical adhesive tape extending externally. Moulding plate along with the lip-taping force yields a controlled movement of alveolar segments in a predetermined direction. The extended wire bending part went through the lip and the loop was covered with acrylic resin to support the ala of nose, stabilized with the help of adhesive tape. Blanching of mucosa was seen on the left ala of the nose (Fig 5). The parents were instructed to start taping the lip across the cleft lip and demonstrated, how to insert and remove the moulding plate, plate should be maintained in position inside the mouth for 24hours a day and removed only for cleaning after feeding. The patient was recalled at each 15 days intervals for 1 and half months for activation then the modification of the plate was started to gradually approximate the alveolar segments. This was achieved by selectively removing hard acrylic and adding soft denture base relining material. After 2 months of follow-up, it has been shown that the cleft gap was reduced to 3mm from 7mm (Fig 6).



Fig 5 a : Lip taping, b: Mucosal blanching of left ala of the nose



Fig 6: Reduce cleft size after 2 months follow up (3mm from 7mm)

DISCUSSION-

The major intraoral benefit of PNAM is its ability to guide the alveolar segment into a normal position and reduce the severity of the cleft deformity before surgery, as a consequence improved surgical

outcomes. NAM-Grayson system guides maxillary alveolar changes acting directly on the maxillary flange.⁵ other benefits include reduction in the need for revision surgery, reduced burden of care and consequent reduced overall cost of care.⁶

Berggren (2001) and Berggren et al (2005) used a different approach—adhesive paper tape and a nasal elevator to improve the morphology of the nose before the surgery. Monasterio et al(2008) used a simple nasal elevator made with a paper clip lined with plastic, and an elastic band fixed to the forehead, combined with paper tape to approximate the cleft edges, but later on in 2009, to simplify the procedure and in trying to avoid the intraoral plate and, the paper tape was replaced by paper tape with an elastic band, ‘DynaCleft’.⁵ A nasal traction device, along with the DynaCleft band can be used as a comparable alternative treatment protocol, which acts indirectly on the maxillary segments by the force vectors generated by the gentle traction of the lip muscles. It is less invasive, less expensive, and also generates less nostril airway reduction.

CONCLUSION-

PNAM allows an overall improvement in the aesthetics of the nasolabial complex in both the unilateral and bilateral cleft conditions while minimizing the extent of the surgery and the overall number of surgical procedures.

The cleft deformity is significantly reduced in size with the NAM therapy before surgery, making primary repair of the lip, alveolus, and nose an effortless procedure with less scar formation.

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