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Case Report

Presurgical nasoalveolar moulding: A boon in the management of cleft lip and palate

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Introduction

A particularly difficult challenge in the cleft lip and palate (CLP) cases is establishment of a columella/non-surgical lengthening of columella which is present in a rudimentary form in such cases and the nasal cartilages deformity correction. The temporary plasticity of nasal cartilage and alveolar ridge in the neonatal period is attributed to maternal oestrogen triggered high levels of hyaluronic acid, found circulating in the infant for several weeks after birth.¹ This temporary plasticity is made use of in

presurgical nasoalveolar moulding (PNAM), to provide measurable long-term benefits to the patient.^{2,3} The various advantages of PNAM include active moulding/repositioning of the deformed nasal cartilages/alveolar processes, lengthening of the columella, anatomical lip position facilitating repair with minimum scarring, more favourable bone healing, reduced need for secondary alveolar bone grafts, hospitalization time/cost and provide the psychosocial benefit to the family. The few drawbacks associated with the procedure are airway obstruction from ill-fitting appliance, locked out segment, alar rim expansion, soft tissue irritation and fungal infection.

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Fig. 1 – Unilateral CLP pretreatment extraoral/intraoral view.

The PNAM is achieved by an oral appliance, which needs continuous modification as the treatment progresses. An accurate impression, while maintaining airway patency, is the key to fabrication of good appliance and to that effect various techniques used are infant upside-down, supine position, infant in mother's lap with head down, etc. depending on operators expertise. The elastomeric impression materials are the best choice for impression recording to meet the desired goals although impression compound and alginate can also be used. Two cases, one each of unilateral and bilateral CLP treated with the PNAM, are presented.

Case 1

A 7-day-old infant with CLP was referred for evaluation and fabrication of feeding appliance. On examination, there was complete unilateral CLP of the right side with oro-nasal communication. The size of the cleft measured 12.5 mm at the alveolus and nose tip was deviated 7 mm from the midline (Fig. 1).

Keeping in sight the size of defect, the case was taken up for PNAM to achieve more aesthetic surgical closure. The preliminary impression was made with impression compound followed by final impression in elastomeric material for fabrication of appliance. Initially, a feeding plate was inserted

to achieve comfortable adaptation followed by PNAM appliance. The alveolar segments were gently moulded with the appliance and manual manoeuvre every 3-4 days.

When the defect was reduced to 6 mm, after 5 weeks, a nasal stent made of aluminium wire was added to the appliance. The nasal end of the wire was covered with the soft acrylic to form nasal button. The adjustment of appliance continued and nasal stent was adjusted to obtain normal shape of the right nostril. The result after 2.5 months was as shown in Fig. 2, with alveolar defect reduced by 9.5 mm, definite columella established, nostril shape normalized and nose tip aligned almost in the midline.

Case 2

A 4-day-old infant with CLP referred for assessment to help improve feeding. On examination, there was incomplete bilateral cleft lip, complete bilateral cleft palate with premaxillary prominence and oro-nasal communication (Fig. 3). The alveolar clefts were not wide but columella was deficient and direct surgical intervention would have depressed the tip of nose producing permanent deformation.

With the sight on elongation of columella to achieve normal nose shape and post-surgical growth, the treatment was planned for dual purpose of feeding appliance and



Fig. 2 – Post-PNAM extraoral/intraoral view of unilateral case.

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