NASOALVEOLAR MOLDING IN CLCP PATIENTS

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Abstract
Cleft lip and palate is the most common congenital defect of the oral cavity which possesses a serious socioeconomic trouble. Cleft lip and palate are the most commonly seen congenital deformities that mainly occur at the time of birth. Nasoalveolar reconstruction for patients with cleft lip and palate is a challenging job for the surgeon. Many procedures to obtain esthetic results and decrease the cleft gap have been suggested. Presurgical nasoalveolar molding is used as an adjunct for reshaping the alveolar and nasal segments prior to surgical repair. Rehabilitation of cleft lip and palate usually requires a team approach which includes a plastic surgeon, orthodontist, speech therapist, pediatrician and a prosthodontist.
Keywords: Cleft lip, Cleft palate, Nasoalveolar molding, NAM appliances, Presurgical infant orthopaedics.

Introduction

Cleft lip and palate, is said to be the most common congenital craniofacial anomaly caused by abnormal facial development during gestation. It presents itself as a typical abnormal form or position of the nasal structures.
In India the birth prevalence of clefts is ranging between 27,000 and 33,000.[1] Therefore, the incidence of this in India is 1 in 781 live births.[2]
Males are most commonly affected by Cleft lip whereas females are most commonly affected by cleft palate. The Unilateral clefts are more common than bilateral clefts. Among the unilateral clefts, 70% of the clefts occur on left side.[3]
Rehabilitation of CLP usually requires a team approach which includes a plastic surgeon, orthodontist, speech therapist, pediatrician and a prosthodontist. The main objective of the treatment is to reconstruct the normal anatomy. Improving the nasal abnormality by the elongation of the nasal mucosal lining, and the attainment of nonsurgical columella lengthening can be united with the shaping of the alveolar process in these patients.[4,5]
Nasoalveolar molding (NAM) is basically, a non-surgical method of reshaping the lips, the gums, and the nostrils prior to surgery, therefore decreasing the cleft severity. With the advent of Presurgical Nasoalveolar Molding multiple surgical procedure are bypassed, to obtain the better results, with less number of surgeries. [6]

What is NAM?

NAM is a nonsurgical way of reshaping the gums, lip and nostrils with the help of a plastic plate prior to CLP surgery. Hence, it may reduce the number of surgeries that the child needs therefore, makes the cleft less severe.

Principle of NAM

NAM basically, works on two principles i.e. "Negative sculpturing" and "Passive molding" of the adjacent soft tissues and the alveolus .In negative sculpturing a number of serial modifications are made with the addition or deletion of material to the internal surfaces of the molding appliance to get proper shape of the nose and the alveolus [6]. While, In Passive molding, a custom made acrylic molding plate is used to direct the growth of the alveolus to achieve the better results.

Steps for NAM therapy

During the 1st week or early 2nd week after the birth, the clinical procedures and fabrication of NAM plate should be started, because during this time the molding of tissues is easier.[6]

Impression technique

Initially the impression is obtained with the help of heavy-bodied silicone impression material. Yang et al.[7] used a pre-trimmed customized pediatric tray for the impression with the baby in the most upright position, and being held by one of the parents. Grayson & Maull [8] held infant in an upside down position, as allow the fluids to drain out and to prevent the tongue from falling back, after that the tray loaded with the impression material is placed. The tray should be placed in the infants mouth, until the impression material adequately covers the anatomy of the upper gum pads. Prasanth et al. [9] Mishra et al[4] took the impression in the prone position when the infant was awake. Without anesthesia the infant is held on the lap of their parents.
The impression tray is then taken out from the infants mouth once the impression material is set. The infant's mouth is checked for remaining impression material. After this the impression is poured with the dental stone.

Appliance fabrication

Utility wax is used to block the undercuts after that, separating media is applied on the cast. The NAM plate is fabricated with hard, clear self-cure acrylic and is trimmed with a denture soft material as described by Grayson and Maull. [8] The retention arm is positioned anteriorly at about 40 degrees to the plate. The vertical position should be at the junction of the upper and lower lip, while the retention button holds the molding plate in the oral cavity (Figure 3). Various materials have been used for the fabrication of NAM appliance like Soltam

Figure 1: NAM Appliance

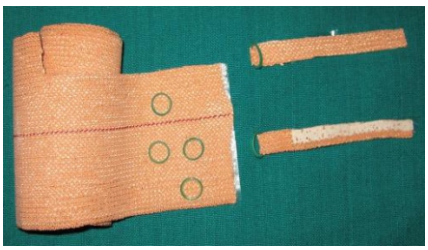

Figure 2: Tape with elastics at one end

Figure 3: Attachment of tape on retention stop

Karimi et al[10] used light cure polymerizing material, Upadhyay et al[11] used 2mm thermoplastic base plate.

Insertion of appliance

The NAM appliance is secured to the cheeks bilaterally with the help of surgical tapes like (Tegaderm or DuoDerm) with orthodontic elastic bands at one end (Figure 2 & 3). The orthodontic elastic on the surgical tape is looped on the retention arm of the molding plate and the tape is secured to the cheeks.

Adjustment of the appliance

Weekly appointments are set for the patient in order to make adjustments to the molding plate. Removal of hard acrylic and addition of soft denture base material to the molding plate are made during these appointments (Figure 4). Modification of not more than 1 mm should be made at one visit.

Nasal stent

It is incorporated in the NAM appliance when the width of alveolar gap width is decreased to 5mm and resembles kidney shape (Figure 5). In the appliance nasal stent is added to the vestibular shield. In this the upper lobe enters the nose and gently lifts forward whereas the lower lobe of the stent elevates the nostril apex and defines the top of the columella.[12]

Figure 4: Adjustment of appliance

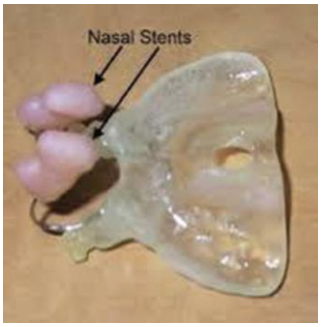

Figure 5: NAM appliance with nasal stent

Modifications

Suri and Tompson[13] used the modified muscle-activated maxillary orthopaedic appliance in Nasoalveolar molding therapy; Alveolar molding appliance with expansion screw; by Retnakumari et al.[14] Singh et al [15] used the self-retentive appliance with the help of orthodontic wire by and Ijaz[16] in presurgical infant orthopaedics, Doruk and Kilic[17] used extraoral molding appliance, Bennun and Figueroa[18] described dynamic presurgical nasal remodelling intraoral appliance.

Discussion

Nasoalveolar molding is used effectively to reshape the nasal cartilage and mold the maxillary arch before CL repair and primary rhinoplasty. Studies show that nasal shape is stable with better lip and nasal form.[19] Nasal deformity in infants with nasolabial clefts stainless steel bar or stent 2 mm in diameter. The average duration of treatment is between three to four months, but this may vary according to individual needs.NAM is an effective technique that is applied by parents daily.[20-21] Parents receive a huge sense of satisfaction by playing an active role in helping improve their child's results from cleft surgery by taking part in the NAM process.[22]

Conclusion

NAM effectively improves nasal symmetry. Align and approximate the gums, reshape the deformed nasal cartilage on the cleft side, and also correct the nasal tip

hence, this technique will give psychological reassurance to the parents, and enhance surgical outcome.

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How to cite this article: Sharma P, Adil M, Misra V, Jain A, Sharma H. Nasoalveolar Molding In CLCP Patients.TMU J Dent 2017;4(3):97-99.