

# Naso Alveolar Molding in Early Management of Cleft Lip and Palate

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Received: 3 December 2010 / Accepted: 19 August 2012 / Published online: 7 September 2012  
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**Abstract** Cleft lip and palate is a congenital anomaly occurring at birth. This article describes about the construction of feeding plate which is also used for naso alveolar molding (NAM). The main objective of this treatment is that this procedure minimizes the extent of surgery that should be done on newborns. Two infants with unilateral and bilateral cleft lip and palate are treated by making feeding plate and which is also used for NAM. Both the infants had favorable results, better in case of unilateral cleft lip patient; we hope that it will minimize the extent of surgery and the resultant scarring.

**Keywords** Naso alveolar molding · Unilateral and bilateral cleft lip and palate · Feeding plate · Soft liner material

## Introduction

Congenital palatal defect such as cleft lip and palate hinders patient with a normal speech and swallowing. Parents of a new born child with such defect finds it difficult to feed the baby which directly affect the speech and growth. A feeding plate is usually constructed to aid in feeding. The

same can be modified to facilitate naso alveolar molding (NAM) before the surgical correction.

NAM is a type of active pre-surgical orthopedic appliance used to facilitate primary unilateral cleft lip and nasal repair.

One out of 600 children born is affected with cleft lip or palate.

Cleft lip/nose develop 4th–8th week of gestation and Cleft palate around 7th–12th week of gestation [1].

Bilateral cleft lip and palate is one of the most challenging congenital anomalies, repair can cause severe scarring.

The deficient tissues should be expanded; malpositioned structures should be repositioned before surgical correction.

The defects have been drastically reduced with pre-surgical infant orthopedic appliance or molding plate therapy (PSIO).

McNeil 1950, Mylin 1968, Latham 1980 developed various techniques to mold the intra alveolar segment closer together in unilateral and bilateral cleft. Presurgical naso alveolar molding (PNAM) developed by Barry Grayson, Orthodontist in 1993 [2], it helps in

1. Reduction in the size of intraoral alveolar cleft
2. Active molding and positioning
3. Done in newborns
4. Reduction in the extent of surgery and resultant scarring

Treatment period is 2–3 weeks, a little longer for bilateral cleft, should be started at birth because level of hyaluronic acid is higher at birth and reduces by 6 weeks. Hyaluronic acid enables the breakdown of intercellular matrix allowing plasticity (molding) of tissues and bone [1].

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36th IPS conference, Bangalore, 8-Nov 2008, scientific paper.

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## Case Report

A 20 day old girl child (Fig. 1) with unilateral cleft lip and palate reported at Vinayaka Mission's Dental College. The child was planned for surgery at the end of third month and sent here for construction of feeding plate to facilitate feeding.

A second male child (Fig. 2) little older than a month reported with bilateral cleft lip and palate. Parents found it extremely difficult to feed the baby.

## Fabrication of Molding Plate/Feeding Plate

1. To construct a molding plate it is essential to make impression
2. The child's oral cavity is checked for presence of tooth and cleft extent measured (Fig. 3)
3. The child should be fully awake not sleepy as it is important while making impression to avoid aspiration
4. Suction apparatus is kept ready (endotracheal tube)
5. Impression is made with putty silicone. (two parts base with one part catalyst) for faster setting.
6. Alginate is avoided because of the risk of aspiration
7. Patient's face is held down as shown in picture to avoid aspiration (Fig. 4)
8. One holds the child while the other person makes impression
9. Impression is made with small stainless steel spoon, can also use infant acrylic tray or spatula
10. Child should be crying while making impression. Otherwise we will know that airway is blocked.
11. Once Impression (Fig. 5) was fully set it was carefully removed and two casts were made, one for construction of molding plate and the other for measuring the intra alveolar gap.
12. Cleft region was filled with wax to approximate
13. Molding plate was made with clear acrylic resin (can be made with heat cured or self cured)



**Fig. 1** Unilateral Cleft lip and palate



**Fig. 2** Bilateral cleft lip and palate



**Fig. 3** Cleft extent measured



**Fig. 4** Impression making

14. It is tried in the child's mouth and adjusted so that there is no acrylic in the cleft area.
15. It is highly polished and made smooth
16. The plate is extended extra orally through the cleft lip region with acrylic buttons at 45° to occlusal plane (Fig. 6) and attached on face with tapes (Fig. 7).



**Fig. 5** Impressions unilateral cleft



**Fig. 8** Areas marked for addition of soft liner



**Fig. 6** Molding plate with retention buttons



**Fig. 9** Addition of soft liner for NAM



**Fig. 7** Molding procedure



**Fig. 10** PNAM appliance with extra oral retention tapes

17. Child's parents were taught to remove, clean and insert
18. The first child was quite comfortable; where as the second child with bilateral cleft took some time.
19. Babies were asked to come after 1 week to begin NAM

### **Procedure of Molding**

NAM is carried out by series of addition and removal of hard acrylic and soft liner tissue surface modified as shown in picture (Fig. 8) Green colour shows area of addition of hard acrylic, Blue denotes removal of acrylic from cleft

area and soft liner (GC Liner) of thickness 1–1.5 mm in the region from which we want the bone to be reduced or moved is added is shown in red colour (Figs. 9, 10).

Unilateral cleft molding is carried out by directing larger alveolar segment towards smaller segment and there by closing alveolar cleft. For bilateral cleft molding is carried out by directing the posterolateral segment outward, derotating premaxilla inward in alignment with posterior alveolar segment and closing alveolar cleft. Serial modifications are carried biweekly.

## Discussion

The previous studies done on NAM have shown excellent results [2–4]. There was a reduction of more than 1 mm of alveolar cleft area. Although the child was not a new born still the results were favorable.

The child with bilateral cleft lip and palate was a little older, so results were not very favorable with NAM, still we expect the number of surgery will be reduced and hence the resultant scarring.

## Conclusion

PNAM can help to reduce the cleft gap more effectively in unilateral cleft lip and palate. Long term result of the method needs further investigation.

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