



Case Report

ISSN: 2581-3218

IJDR 2024; 9(1): 1-3

Received: 19-12-2023

Accepted: 25-03-2024

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www.dentistryscience.com

doi: 10.31254/dentistry.2024.9101

Presurgical Nasoalveolar Moulding of Complete Unilateral Cleft lip and Cleft palate- A Case report

A B Bindu¹, Madhu S², Kannan Vadakkepurayil²

¹ Assistant Professor, Department Pedodontics & Preventive Dentistry, Sree Anjaneya institute of Dental Sciences, Kozhikode, Kerala, India

² Professor & Head, Department Pedodontics & Preventive Dentistry, Govt Dental college, Thrissur, Kerala, India

³ Professor & Head, Department Pedodontics & Preventive Dentistry, Govt Dental college, Kottayam, Kerala, India

Abstract

Nasoalveolar moulding is a non- invasive method of bringing lip, palate and alveolus together in the cleft lip and cleft palate patients by redirecting forces of natural growth and reducing the severity of initial cleft deformity before surgical correction. Presenting a case report of a baby treated with nasoalveolar moulding with selective addition and deletion of nasoalveolar plate to direct alveolus to an optimal position reducing the size and complexity of the existing problem and enhancing post-surgical stability with multidisciplinary approach.

Keywords: Nasoalveolar molding (NAM), Cleft lip and palate (CLP), Nasal stent, Nasoalveolar moulding appliance (NAM appliance), Case report.

INTRODUCTION

Cleft lip and palate, the most common congenital defect of orofacial region ^[1]. The prevalence of cleft lip and palate based on the meta-analysis studies reviewed in each 1000 live births was 0.45 ^[2]. The incidence of cleft deformity in various regions of India was reported in the range of 0.54-2.75 per 1,000 live births ^[3]. Cleft lip and palate have a multifactorial etiology, consisting of genetic and environmental factors. Failure of fusion of the maxillary prominence and the medial nasal prominence causes cleft lip, while failure of fusion of the palatine prominences leads to cleft palate.

Infants with Cleft lip and palate have difficulties in feeding, hearing, speech and defects in dentition. Infant must be fed with adequate nutrients to increase the resistance to infection, to enhance weight gain, to enable for surgical interventions, to handle the stress of surgery and to promote healing after the surgery ^[4].

Treatment is initiated as early as 3-4 months of age since the presence of circulating maternal estrogen increases the level of hyaluronic acid (HA) by which cartilage can be easily molded ^[5].

Nasoalveolar moulding is a non- invasive method of bringing lip, palate and alveolus together in the cleft lip and palate patients by redirecting forces of natural growth and reducing the severity of existing initial cleft deformity before surgical correction ^[6]. Presenting a case report of two months old baby boy with complete unilateral cleft palate and cleft lip, who was referred from a private hospital, to the Department of Pedodontics, Govt Dental college, Kozhikode.

CASE REPORT

A two months old baby boy with complete unilateral cleft palate and bilateral cleft lip (Fig- 1 and 2) was referred from private hospital to the Department of Pedodontics, Govt Dental college, Kozhikode. The baby was examined and presurgical nasoalveolar moulding treatment was suggested. To fabricate the moulding appliance upper impression was taken using vinyl polysiloxane soft putty impression material while the baby was kept in mother's lap with head downwards and mother's hand holding baby's chest. Cast was made using dental stone.

*Corresponding author:

Dr. Bindu A B

Assistant Professor,
Department Pedodontics &
Preventive Dentistry, Sree
Anjaneya institute of Dental
Sciences, Kozhikode, Kerala,
India

Email: abbindu74@gmail.com

The appliance as described by Grayson et al [7] was fabricated using hard self-cure acrylic resin and trimmed with denture soft materials. A retention button is fabricated and positioned anteriorly in cleft region at an angle of 40 degree to the plate. The vertical position of retention button extends to junction of upper and lower lip. An opening of 6-8 mm diameter was placed on palatal aspect to provide airway in case plate drops posteriorly.

During insertion NAM appliance is secured extra orally to cheeks using sterile, breathable adhesive strip of quarter inch width. Skin barrier tape of ½ inch width is secured on cheeks to avoid skin irritation due to repeated removal of adhesive tape daily. Heavy orthopaedic elastic of ¼ inch diameter adapted to adhesive tape is stretched twice the length and looped on to retention button of NAM plate. The amount of force applied varies depending on clinical objective and mucosal tolerance. Parents are instructed to make the baby wear the appliance full time and to remove it for daily cleaning. Baby might have difficulties in early days until they become used to wearing the appliance.

The baby is reviewed weekly and moulding is done to bring alveolar segment closer with selective addition of soft acrylic liner and grinding of acrylic plate to direct the alveolus to an optimal position.

The minimum gap between 2 alveolar segment was 5mm initially, once this has reduced nasal stent (Fig- 3) is added to NAM appliance. Nasal stent is made up of 21G round stainless steel wire and is placed near base of retention button corresponding to deformed nose. The wire is bent forward then backward to accommodate the nostril , as it enter nose it bent on itself and hard acrylic is placed over it in bilobed shape. A soft reliner coating is placed over it for comfort. First stent is placed passively later it is again relined to produce blanching so that upper lobe of stent elevates the dome and lower lobe elevate the the nasal apex to define the columella (Fig- 4).

RESULTS

After two and half months of treatment the closest gap between the alveolus of 5mm which was taken as reference has reduced to nearly 1 mm (Fig- 5 and 6) with this treatment of selective addition and grinding of NAM plate.



Fig-1 Pretreatment intraoral



Fig-2 Pretreatment E/O view



Fig-3 NAM with nasal stent



Fig-4 Baby with NAM & nasal stent.



Fig-5 Post treatment intra oral view



Fig-6 post treatment extra oral view



Fig-7 Post surgical view

DISCUSSION

In 1975, Georgiade and Latham fabricated a pin-retained active appliance that concurrently retracted the premaxilla and expanded the posterior segments [7]. Grayson’s, NAM appliance incorporates an intraoral moulding plate with nasal stents to achieve better repair of the alveolus, lip and nose. This appliance eliminates surgical columella reconstruction, resultant scar tissue and favours bone formation thus reduces the need for secondary alveolar bone grafts [6].

In 2020, a study on Presurgical Nasoalveolar Molding Therapy in Bilateral Cleft Lip and Palate– A Case Report by Jaziya Z et al, introduced an active intraoral appliance consisting of two components, the acrylic premaxillary and palatine process plates, connected with two elastic chains. This simple appliance is light weight, cost-effective and retentive [8]. In 2022, a study on Modified presurgical nasoalveolar molding for patients with neonatal complete bilateral cleft lip and palate having a severely malpositioned premaxilla by Jiansuo Hao et al, employed a device that rapidly centralize the malpositioned premaxilla and reduce the alveolar cleft defect. A significant reduction was found in the distance of premaxillary protrusion after treatment [9].

In the present case, the baby’s treatment was started around two month age with NAM appliance and treatment done at 1 week interval by selective grinding and addition of soft liner to redirect the alveolus to more optimal position. The parents were well motivated to use the appliance for maximum time.

Tegaderm was used to reduce irritation to cheeks, The orthopaedic elastics were changed daily and looped on to retention button by stretching it twice. The use of soft reliner to mould the cleft and align in optimal position achieved with parent motivation in a limited time of 3 months.

CONCLUSION

NAM has been an effective treatment for patient with cleft lip and palate reducing the complexity of the problem and enhancing post surgical stability. The treatment involves a multidisciplinary approach comprising Plastic surgeon, Pediatric surgeon and a Pediatric Dentist. It is important that parents or caregivers become active members of the treatment plan [6]. Without parent or care taker support this treatment will not come out successfully. So parent should be well educated and motivated regarding the treatment.

Conflicts of Interest

The author reports no conflicts of interest.

Funding

None declared.

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HOW TO CITE THIS ARTICLE-

Bindu AB, Madhu S, Vadakkepurayil K. Presurgical Nasoalveolar Moulding of Complete Unilateral Cleft lip and Cleft palate- A Case report. *Int J Dent Res* 2024; 9(1):1-3. doi: 10.31254/dentistry.2024.9101

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