

An innovative modified feeding appliance for an infant with cleft lip and cleft palate: A case report

Naveen BH¹, Raghavendra Prasad S¹, KR Kashinath¹, Shylesh Kumar¹, Kalavathi SD¹, Narendra Laishram¹

¹Department of Prosthodontics, Sri Siddhartha Dental College, SAHE University, Agalkote, Tumkur, Karnataka, India

ABSTRACT

Cleft lip and palate is one of the most common craniofacial anomalies of humans. A child born with cleft lip and palate may experience difficulties while feeding due to lack of seal of the oral cavity due to incomplete facial and palatal structures. Difficulty in feeding leads to inadequate nutrition and affects the health of the infant. Feeding difficulties should be assessed and intervened as early as possible, as they are an important aspect of the multidisciplinary team approach in the management of cleft lip and palate. Feeding appliance is a favorable feeding option in these infants as it creates a separation between oral and nasal cavities and thus helps in creating a negative intraoral pressure during suckling. This case report represents a fabrication of feeding appliance for a 2-day-old neonate born with cleft lip and palate, using copper wire as a retainer for the appliance.

Keywords: Cleft lip, cleft palate, feeding appliance, multidisciplinary approach

Introduction

Cleft lip and palate is one of the most common craniofacial anomalies in humans, with an incidence of 0.28 –3.74 per 1,000 live births.^[1] Cleft of the palate, alveolus, and lip may be syndromic or non-syndromic. The syndromic types are by definition associated with other malformations and include the Pierre Robin Syndrome, Treacher Collin malformation, Trisomies 13 and 18, Apert's syndrome, Stickler's syndrome as well as Wanderburg's syndrome.^[2] Non-syndromic clefts are of polygenic/multifactorial inheritance. Neonates with cleft palate have difficulty in feeding, which may lead to failure to thrive.^[3] A feeding appliance is a prosthetic aid that is designed to obturate the cleft and restores the separation between oral and nasal cavities.

Address for correspondence: Dr. Naveen BH, Professor and HOD, Department of Prosthodontics, Sri Siddhartha Dental College, SAHE University, Agalkote, Tumkur - 572 107, Karnataka, India.
E-mail: drmythripd@gmail.com

Received: 22-04-2019 **Revised:** 23-04-2019 **Accepted:** 07-05-2019

Various feeding methods have been used in the past to resolve feeding difficulties. Feeding appliance is a favorable feeding option in an infant with cleft lip and palate, as it creates a separation between oral and nasal cavities and provides a rigid surface to oppose the breast or nipple during suckling.^[4] This article represents a case report of a modified feeding appliance using a copper wire for retention in an infant with cleft lip and palate.

Case Report

A 2-day-old neonate was referred from a pediatric private practitioner to the Department of Prosthodontics, Sri Siddhartha Dental College and Hospital, Tumkur, with a chief complaint of difficulty in feeding. On examination, it was found that the child was born with unilateral cleft lip and palate on the left side [Figure 1a]. After discussion with child's parent, it was found that the mother had difficulty in breastfeeding the newborn, as an immediate concern at that time was feeding and nutrition of

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Naveen BH, Prasad RS, Kashinath KR, Kumar S, Kalavathi SD, Laishram N. An innovative modified feeding appliance for an infant with cleft lip and cleft palate: A case report. J Family Med Prim Care 2019;8:2134-6.

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_327_19

the infant, decision to fabricate a feeding appliance was made in the department of prosthodontics. Parents were explained about the procedure, and written and signed informed consent was obtained from them.

Procedure

A plastic disposable spoon of adequate size covering the entire palate along with cleft was used. An impression was made using polyvinyl siloxane putty material (Dentsply Aquasil soft putty) [Figure 1b] with the neonate held in prone position to prevent aspiration of the impression material. The child kept crying during impression making, which had an advantage of ensuring that the airway was patent. The impression was poured with die stone (Kalabhai; Kalrock) [Figure 1c]. The custom tray was fabricated on the primary cast, and the final impression was made with light body impression material (Aquasil ultra LV) [Figure 1d]. Feeding appliance was made using heat cure clear acrylic resin (DPI.,) [Figure 1e]. The appliance was trimmed, borders were rounded, and polished to avoid trauma to the surrounding tissue. For emergency purpose, a thread was attached to the appliance, and the mother was asked to hold the appliance against resistance using thread while feeding to avoid swallowing [Figure 1f and g].

For better retention, another appliance was conceptualized wherein a small canal was prepared in the appliance. In addition, through this canal, two copper wires were fitted for the protection of the child to prevent from gag reflex or from swallowing the plate [Figure 1h]. An advantage of using copper wire was it can be easily adapted and molded to the soft tissues of a particular infant. To prevent irritation to the tender skin and for the comfort of the infant, the wire was covered with gauze. The wire also acted as a safety measure for easy removal of the appliance after feeding.



Figure 1: Procedural steps for making innovative feeding appliance for home care of the neonate. a) Pre operative view b) Putty impression c) Primary cast with custom tray d) Final impression e) Master cast f) Feeding appliance with thread in place g) Feeding appliance with thread in place h) Feeding appliance with copper wire i) Feeding appliance in place

After preparation of appliance, parents were recalled with their child and appliance was placed in the infant's mouth taking care not to irritate the surrounding soft tissues or activate gag. Fit of the appliance was checked, thereafter suckling response was observed by placing a finger in the child's mouth [Figure 1i]. The child was able to suck and create a negative pressure onto the finger.

Mother was instructed to breastfeed the child. The infant was able to breastfeed comfortably with the appliance in place. The infant was kept on a regular follow-up to assess the success of feeding appliance by regular weight monitoring and for the periodic adjustment in the feeding appliance. Parents were instructed about the placement, removal, and cleaning of the feeding appliance and replacement of gauze. The appliance was advised to be used only during feeding and should be kept submerged in the water when not in use. After feeding, thorough cleaning of the infant's oral cavity and cleft with soft cloth or cotton soaked in warm water were advised.

Discussion

Adequate nutrition is the main priority in patients with cleft lip and palate, and technique should be found so that feeding is as close to normal breastfeeding as possible.^[5]

A feeding appliance bridges the gap between oral and nasal cavities. Feeding obturator becomes urgent in cleft lip and palate infants as surgical treatment usually starts at 2–3 months of age.^[6]

A variety of impression materials such as alginate, low fusing compound, and polysulfide material may be used to make a definite impression.^[4] In the present case, a putty type polyvinyl siloxane was used to make an impression because of its high viscosity reduces the danger of aspiration or swallowing and its relatively good detail registration property. PRECAUTION TO BE TAKEN WHILE IMPRESSION MAKING - A mouth mirror should be used to depress the tongue and maintain the airway patency all the time. After impression making, wet cotton should be used to clean the infant's mouth to remove any left remnants of impression material. Owing to undercut engagement, difficulty in impression removal and fragmentation of the impression material may occur, leading to aspiration and causing airway obstruction. In case of inadvertent aspiration, the infant should be noted for the signs of airway obstruction. Back blows, chest thrust, and finger sweeps maneuvers should be used to relieve the airway obstruction. Blind finger sweeps should never be performed as it poses the risk of further pushing the fragments into the airways.

Advantage of adding copper wire to the appliance, malleability of copper wire, it was used for this appliance as it can be easily adapted and molded to the soft tender skin of the particular infant.

Advantages of using feeding appliance include^[6]:

1. It helps to maintain adequate nutrition by covering the cleft palate and providing a rigid platform toward which the infant can press the breast and extract milk
2. It assists in normal suckling and thus leads to the development of normal oromotor and swallowing reflexes
3. Reduces feeding difficulties such as nasal regurgitation, choking, and shortens the feeding time
4. It positions the tongue in correct posture preventing it to enter into the defect, thus helps in the growth of the maxilla and maxillary shelves toward each other
5. Reduces the passage of milk into the nasopharynx and thus reduces the incidence of nasopharyngeal infections and otitis media
6. It also helps in presurgical nasoalveolar molding
7. After cheiloplasty provides cross arch stability and prevents maxillary arch collapse.

Conclusion

Adequate nutrition is very important for proper growth and development of a child. Inadequate nutrition affects normal growth and development of the newborn but also creates parental anxiety. Use of the feeding appliances aids in better feeding, speech, promotes adequate nutrition and weight gain, reduces nasopharyngeal and middle ear infection until the surgical correction of the defect is carried out and therefore ensures normal physical, mental, and psychological well-being of the infant and the parents.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Agarwal A, Rana V, Shafi S. A feeding appliance for a newborn baby with cleft lip and palate. *Natl J Maxillofac Surg* 2010;1:91-3.
2. Chandna P, Adlakha VK, Singh N. Feeding obturator appliance for an infant with cleft lip and palate. *J Indian SocPedod Prev Dent* 2011;29:71-3.
3. Gupta R, Singhal P, Mahajan K, Singhal A. Fabricating feeding plate in CLP infants with two different material: A series of case report. *J Indian SocPedod Prev Dent* 2012;30:352-5.
4. Rathee M, Tamrakar AK. Single visit custom made flexible feeding obturator for an infant with tetralogy of fallot. *Saudi J Med Med Sci* 2015;3:226-9.
5. Goyal S, Rani S, Pawah S, Sharma P. A novel approach for prosthodontics management of patient with cleft of palate. *J Indian Soc Pedod Prev Dent* 2017;35:279-81.
6. Dogra S, Sharma A, Sharma N. Early prosthetic rehabilitation in newborns with orofacial cleft using a feeding appliance: A case report and review of literature. *J Indian Acad Dent Spec Res* 2017;4:5-11.