FABRICATION OF FEEDING PLATE IN NEONATES WITH CLEFT LIP AND PALATE: CASE SERIES

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ARTICLE INFO

Received : 07 April, 2022
Accepted : 16 November, 2022
Published : 27 February, 2023

CR 50

DOI: https://doi.org/10.3126/bjhs.v7i3.52772

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Citation

Parayash Dallakoti, Amita Rai, Sunanda Sundas, Bandana Koirala, Mamta Dali, Neha Dhakal Fabrication of Feeding Plate in Nneonates with Cleft Llip and Ppalate: Case Sseries BJHS 2022;7(3)19. 1915-1918.

ABSTRACT

Cleft lip and palate (CLP) is a common craniofacial anomaly which can be syndromic or non-syndromic. In children with CLP, feeding is the biggest concern due to lack of oral seal owing to the presence of clefts in the oral cavity. To achieve a near normal feeding, feeding plates are delivered to restore the separation thus helping to create negative intraoral pressure during suckling. Impression making for the fabrication of feeding plate is incredibly challenging procedure but selection of appropriate impression material, patient positioning during impression making and preparation for management of emergency mishaps can make the procedure easier and safer. Present case series highlights the fabrication and delivery of feeding plates made up of two different materials (Ethylene vinyl acetate and self-cure acrylic resin) in three neonates who were four, fourteen and five days old.

KEYWORDS

Acrylic, cleft lip and palate, ethylene vinyl acetate, feeding plate

INTRODUCTION

Cleft lip and palate (CLP) is the most common craniofacial anomaly which is developed due to failure of fusion of maxillary process and medial nasal process resulting in cleft lip, and the failure of fusion of palatine shelves resulting in cleft palate.[1] CLP is a polygenic disorder.[2] The significant risk factors for development of CLP are positive family history, advanced maternal age, pregestational hypertension and gestational seizures.[3] The major problems created by CLP are feeding difficulty, speech defect, malocclusion, nasal deformity and hearing deficit. Present case series highlights the fabrication and delivery of feeding plates made up of two different materials (Ethylenevinyl acetate and Self-cure acrylic resin), in three neonates who were four, fourteen and five days old.

CASE REPORT

CASE 1

A four-day-old male neonate was referred to the department of Pediatric and Preventive dentistry, People's Dental College and Hospital, Kathmandu from Pokhara with a chief complaint of feeding difficulties. On clinical examination, bilateral cleft lip and palate (Veau's Type IV) was present (Figure 1). On prenatal history, pregnancy was uneventful and there was no positive family history, history of smoking, pregestational and gestational diabetes and intake of any medication during pregnancy.

Figure 1: 1a. Extra-Oral Photograph, 1b.Tentative gum pad and acrylic tray, 1c. Polyvinyl siloxane impression with putty and light body, 1d. Master cast after relieving undercuts, 1e. After insertion of Ethylene vinyl acetate feeding plate

CASE 2

A 14-day-old male neonate was referred to the department of Pediatric and Preventive dentistry, People's Dental College and Hospital, Kathmandu from Chitwan, with a chief complaint of feeding difficulties. Clinical examination revealed unilateral cleft of lip on the right side and palate (Veau's Type III) (Figure 2). There was history of similar findings in the patient's paternal aunt while other history was non contributary.

Figure 2: 2a. Extra-Oral Photograph, 2b. Acrylic tray, 2c.Polyvinyl siloxane impression with putty and light body, 2d. Master cast after relieving undercuts, 2e.Ethylene vinyl acetate feeding plate with dental floss, 2f. After insertion of feeding plate

CASE 3

A five-day-old male neonate presented to department of Pedodontics and Preventive Dentistry, B.P. Koirala Institute of Health Sciences, Dharan with the chief complaint of difficulty in feeding. On examination, there was unilateral cleft of lip on the right side and palate (Veau's Type III) (Figure 3). There was no positive contributary history.

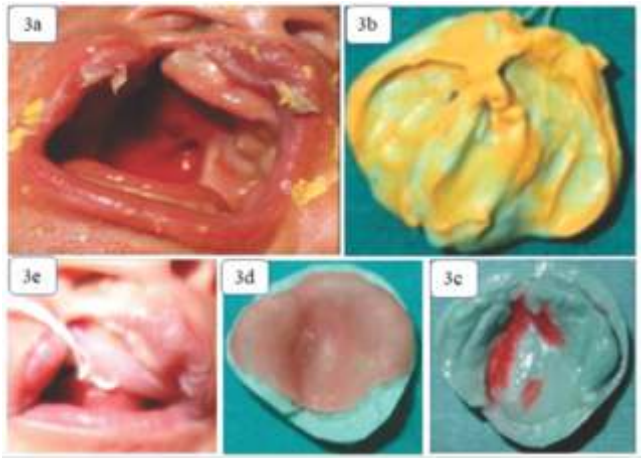

Figure 3: 3a. Extra-Oral Photograph, 3b. Polyvinyl siloxane impression with putty and light body, 3c.Master cast after relieving undercuts,3d. Self-cure acrylic resin feeding plate ready for insertion, 3e. After insertion of feeding plate

DISCUSSION

The global prevalence of CLP is one in 940 live births.[4] A study conducted in Eastern Nepal showed the prevalence of CLP to be 1.64 per 1000 live birth.[5] CLP is more prevalent in males as compared to female (2:1)[4] and coincidentally all the patients in the present case series happen to be males. The main problem in neonate with cleft lip and palate is suckling. Dentists can play a major role in improving the quality of life

by providing feeding plates to such patients. Feeding plate obturates the cleft area and creates a "false palate" which facilitates feeding in a more normal manner. Feeding plate also prevents cleft widening by correction of tongue position.[6] Apart from these, feeding plates provide positive guidance for growth and development of maxillary segments, and provide a positive psychological effect on the parents.[6] Cleft lip can be surgically corrected at the age of two to six months and surgical correction of cleft palate can be done at the age of 12 months to two years.[4] Provision of feeding plate at the earliest is very important to ensure adequate nutritional supply to the child because surgical correction is possible only if the child has gained sufficient weight and hemoglobin concentration.[4]

The major considerations for fabrication of feeding plate are correct patient positioning, selection of impression tray, selection of impression materials, and preparation for management of emergency mishaps. Making impression is a challenging job with many possible complications such as difficulty in removal of the impression due to the engagement in the undercuts, fragmentation and aspiration of the impression materials which may lead to respiratory obstruction.[7] Hence, the operator should be well prepared for emergency. Keeping on mind about the possible mishaps, in all the cases, impressions were made in fully awake patients in the presence of trained Pediatrician or Anesthesiologist, and in place with proper emergency set-up.

Different materials/techniques can be used for making preliminary impression such as with prefabricated trays, wax, ice cream sticks, fingers, handle of impression tray, plastic spoon, perforated acrylic tray.[8] In present cases, the authors chose perforated acrylic tray because it decreases amount of impression material, incidence of cyanosis, impression time[9] and thereby it reduces discomfort to the patients and anxiety among treating doctors.[9] In the first case, an acrylic tray was fabricated in a tentative gum pad, and in the remaining two cases, acrylic trays were fabricated on master casts of previous patients. In the latter two cases where the impression trays were fabricated from the casts of previous patients, fitting was better and needed less modifications. Perforations were created in the trays which allowed impression material to retain in the tray and helped to pass excess impression material through the perforations preventing the flow of material in the oropharynx.

Several types of impression materials such as impression compound, alginate, polysulfide, and polyvinyl siloxane have been routinely used for making impressions of patients with orofacial clefts.[8,10] The putty wash impression with polyvinyl siloxane can produce accurate impressions with good reproduction of the details, and its biggest advantage is greater tear strength and the possibility of making multiple casts with the same impression. In the present cases, impressions were made with polyvinyl siloxane impression material of putty and light body consistency. Infant's crying during the procedure makes sure that impression material is being molded to the anatomic contours and absence of airway obstruction.[10] Ravichandra et.al used fast setting color-timed alginate in cleft patients and found that it records the details even in the presence of saliva, is comfortable to the patient and relatively inexpensive.[11]The main disadvantages of alginate as impression material in cleft cases are the poor tear strength and failure to reproduce minor details. Digital scanning, though an incredibly good option, it is not cost friendly, and warrants the need of sophisticated instruments and trained manpower.[12] In the present case series, despite opting manual method, the technique proved to be safe, cost friendly, guaranteed proper fitting, and ensured the adequate suckling.

In the present cases, two different materials (self-cure acrylic and ethylene vinyl acetate) were used for the fabrication of feeding plates. The advantages of ethylene vinyl acetate over acrylics are its lightweight, moldability, good fit to palate and ridges and the decreased possibility of soft tissue injury because of soft texture.[13] In contrast, acrylic feeding plates provide rigid platform making sucking milk easy and is cost friendly. The need of sophisticated instruments and manpower is also avoided while opting for acrylic feeding plates.

CONCLUSION

Fabrication of feeding plate is a challenging job for a dentist especially the impression making procedure, but proper impression technique, selection of right impression material and preparation for emergency management can make the procedure successful and safer.

PATIENT CONSENT

Informed consent was taken from all parents of patients in written form for the publication.

CONFLICT OF INTEREST

None

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