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IP Annals of Prosthodontics and Restorative Dentistry

Journal homepage: <https://www.aprd.in/>

Case Report

Feeding plate fabrication in a single day for 4 days old infant with cleft lip and palate: A case report

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ARTICLE INFO

Article history:

Received 05-09-2023

Accepted 12-09-2023

Available online 10-10-2023

Keywords:

Cleft lip

Cleft Palate

Feeding Plate

Palatal Obturator

Infant

ABSTRACT

Cleft lip and cleft palate are among the most common birth defects. They most commonly occur as isolated birth defects but are also associated with many inherited genetic conditions or syndromes. The primary need for a child after birth is feeding which helps him to thrive. Patients with cleft lip and cleft palate have difficulty in feeding and suckling milk, the feeding plate becomes boon to such patients which helps to overcome those problems.

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1. Introduction

Infants born with cleft lip and palate exhibit difficulties in feeding, sucking, nasal regurgitation, orofacial defects and velopharyngeal insufficiency.^{1–3} Cleft lip and cleft palate is defined as a combination of clefts on the upper lip and palate that cause direct communication between the nose and mouth. Cleft anomalies can be of either lip, palate or both lip and palate.⁴ According to GPT, feeding prosthesis is an ancillary prosthesis constructed for newborns with cleft palates to permit normal sucking and feeding.⁵ The aetiology of cleft lip and cleft palate includes alteration in genes, chromosomal disorders and various environmental factors. Various factors responsible for cleft and palate includes hormonal changes during pregnancy, exposure to toxic and harmful radiation during pregnancy, nutritional deficiencies, alcohol consumption and cigarette smoking.⁶ Feeding obturator restores the various functions such as mastication, deglutition and speech till the defects of cleft lip and cleft palate are corrected surgically.⁷ Surgical

correction of cleft lip and palate are done within the first year of life, when the child is at least 10 weeks of age, at least 10 pounds in weight, with 10 g/dL Haemoglobin and WBC less than 10,000 / mm³ This case report describes the fabrication of feeding plate for a 4-days old infant in a single day.

Benefits of feeding plate:

1. It becomes a rigid and firm platform against which infant can press the nipple and suck milk.
2. It creates negative pressure thereby reducing nasal regurgitation, choking.
3. Aids in speech development.
4. Keeps the tongue in its proper position and preventing its interference in development of palatal shelves and jaw.
5. Reduces nasopharyngeal regurgitation and orofacial infection thus preventing food aspiration in nasopharynx.⁸

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2. Case Report

4-days old newborn referred to Department of prosthodontics, Government Dental College and Hospital, Aurangabad with the chief complaint of difficulty in feeding, absence of sucking reflex and nasal regurgitation. The weight of child was 2 kg at the time of birth. On clinical examination it was revealed that child was born with bilateral cleft lip and cleft palate. It was Veau Class IV defect. (Figure 1). No evidence of other congenital anomalies was revealed. There was no family history of any craniofacial clefts in maternal or paternal family of the infant. So, it was decided to fabricate a feeding plate which will prevent nasal regurgitation and help in the suckling reflex by maintaining the negative pressure in the mouth.

Procedure

The preliminary impression of the maxillary arch was taken with the modelling wax as it is softer and more pliable (Figure 2). The tin foil was then adapted on the modelling wax impression (Figure 3). The purpose of tin foil here was to prevent conduction of heat from resin to modelling wax impression thus the melting of primary impression is avoided. Also, it allows easy and clean removal of wax from the tray. The custom tray was fabricated with cold cure acrylic resin on preliminary impression (Figure 4). Once the acrylic resin has set the tray was separated from the impression. Final impression was then made with Polyvinyl silicone putty material (Figure 5). All the precautions were taken during this procedure so as to avoid aspiration of impression material by the infant. The infant was held upright to avoid vomiting and asphyxiation due to airway obstruction. The beading and boxing of final impression was done in order to maintain proper borders and it was poured in type IV dental stone (Figures 6 and 7). All the undercuts were blocked using modelling wax and then the master cast was then lubricated with separating media. Feeding Plate was prepared with cold cure acrylic resin and monomer by sprinkle on method (Figure 8). It was properly finished and polished to avoid injury to soft tissue.

A hole was created in the anterior region of plate with the help of carbide bur, and thread measuring approximately 25cm was threaded through it, for easier removal and to avoid accidental swallowing. Feeding plate was inserted in child's mouth to check the comfort and retention (Figure 9). After checking everything infant was fed and was able to suck the milk properly without any discomfort.

Parents were instructed on placement and removal of the appliance and its regular maintenance. Parents were also instructed to use the plate as much as possible.

3. Discussion

Cleft of lip and palate are most common congenital defects affecting the orofacial region. It can occur isolated or simultaneously in various combination and along with



Fig. 1: Infant with cleft lip and palate

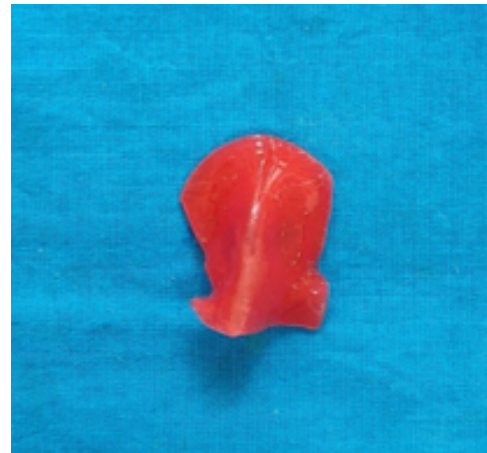


Fig. 2: Preliminary impression of the defect with modelling wax



Fig. 3: Tin foil adapted on primary impression

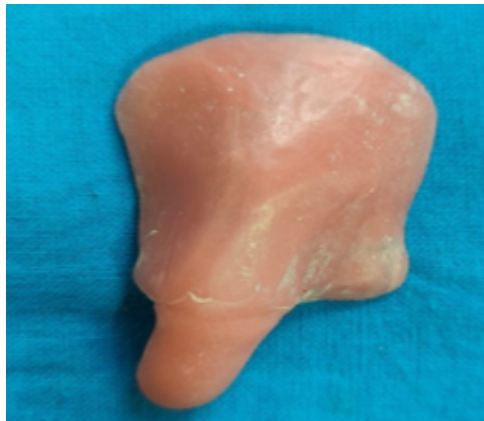


Fig. 4: Special tray

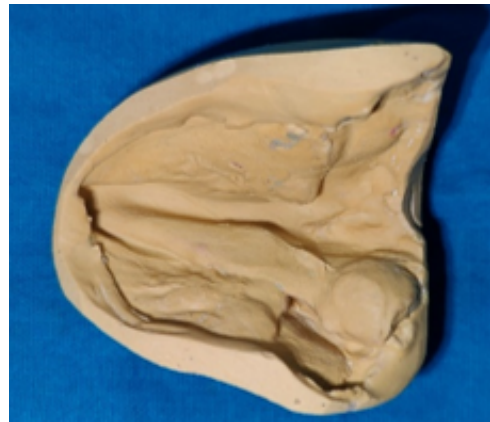


Fig. 7: Master cast



Fig. 5: Final Impression with PVS putty material



Fig. 8: Feeding plate made up of clear acrylic



Fig. 6: Beading and boxing of final impression



Fig. 9: Feeding plate with thread inserted in an infant's mouth.

other congenital deformities particularly congenital heart diseases.⁹

Overall incidence of cleft lip and palate is approximately 1 in 600 to 800 live births (1.42 in 1000) and isolated cleft palate occurs approximately in 1 in 2000 live births. Thus, the typical distribution of cleft types are:¹⁰

1. Cleft lip alone – 15%
2. Cleft lip and palate – 45%
3. Isolated cleft palate – 40%

Parents get more anxious when their infant is born with defects such as cleft lip and cleft palate because it affects their financial, personal and social life before the completion of primary treatment.⁶ Treatment of cleft lip and cleft palate is a multi-disciplinary approach including paediatric dentist, prosthodontist, orthodontist, plastic surgeon, speech therapist.¹¹ Cleft lip and palate are surgically treated within the first year of child's life, but the weight of child should be between 5 – 10 kg and the blood volume should be 400 – 700 ml.⁶ Infants with cleft lip and cleft palate have difficulty in feeding, swallowing which ultimately leads to failure to thrive. The defect leads to decreased ability to create a negative pressure which is required for normal sucking. To overcome this, infant presses the nipple between the tongue and the hard palate. But in cleft lip and palate this is also ineffective. And this leads to complications such as Choking and nasal regurgitation.¹² Therefore, to compensate these hurdles of feeding, a feeding plate is advised, which restores the functions of suckling, swallowing, and speech until the cleft palate is corrected surgically.¹ The basic and primary need for a child after birth that is feeding is met through the use of feeding plate which helps in development of child. Kilner's rule of 10 should be followed in patients of cleft lip and palate. Surgery should be delayed until the child is-¹³

1. At least 10 weeks of age
2. At least 10 pounds in weight
3. 10 g/dL Haemoglobin
4. WBC less than 10,000 / mm³

4. Conclusion

Fabrication of feeding plate in a day using clear acrylic resin and incorporation of thread for easier removal and to avoid accidental swallowing is best treatment modality for patients with cleft lip and palate.⁸ The Feeding Plate overcomes the hindrances which occur during the normal growth and development of a cleft patient and thus should be advised as early as possible after birth. It acts as an important tool for feeding, oral-facial development, development of palatal shelves, prevention of tongue distortion, nasal regurgitation and nasal septum irritation, and avoiding ear infections; it also prevents the expansion of anterior part of the maxilla, which helps the surgeon provide proper reconstructive treatment.

5. Conflict of Interest

None.


6. Source of Funding

None.

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Cite this article: Pawar P, Mahale KM, Khalikar S, Rajguru V, Mahajan S. Feeding plate fabrication in a single day for 4 days old infant with cleft lip and palate: A case report. *IP Ann Prosthodont Restor Dent* 2023;9(3):187-190.