

Feeding Obturator for a 3 Day Old Neonate with Cleft Lip and Palate: A Clinical Report

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Abstract: Clefts of lip and palate are the most common congenital deformities involving the orofacial region. Feeding problems are often associated with cleft anomalies due to communication between oral cavity and nasal cavity, which make it difficult for the infant to maintain adequate nutrition. The feeding obturator restores the separation between the oral and nasal cavities. It creates a rigid platform toward which the baby can press the nipple and extract milk. It also normalizes the tongue position resulting in better speech, aids in better esthetics, reduces feeding time, provides positive psychological impact on the parents and promotes neonatal weight gain which is important in preparing the baby for corrective surgery. This clinical report describes a single visit technique for fabrication of feeding obturator for a 3 day old neonate born with cleft lip and palate.

Keywords: Cleft lip and palate, neonate, feeding obturator, autopolymerizing acrylic resin, prefabricated acrylic tray

1. Introduction

Clefts of lip and palate (CLP) are the most common congenital deformities involving the orofacial region,^{1,2,3,4} characterized mainly by the presence of oronasal communication, malformation or agenesis of the teeth close to the cleft and deficient sagittal and transverse growth of the maxilla.⁵ Cleft lip can be defined as the presence of one or two vertical fissures in the upper lip¹ and cleft palate is defined as a furrow in the palatal vault.^{3,2}

Cleft lip and palate affect several systems and functions that include feeding, facial growth, dentition, mastication, deglutition, speech as well as social and psychological problems which have an impact on the child and parents. Feeding the cleft lip and palate infant poses challenges to the parents. As there is abnormal oronasal communication in these patients. These infants often have difficulty closing their mouth around the nipple of the mother or the bottle to make a seal.⁴ In addition these infants may have excessive air intake, nasal regurgitation, and choking.^{3,4,5,6,7}

A feeding appliance may be a favourable option for babies that are having feeding problems.⁴ The feeding appliance covers the cleft palate and creates a platform toward which the baby can press the nipple and extract milk.⁷ The present case report shows single visit Prosthodontic management of 3 day old neonate born with cleft lip and palate by fabricating feeding obturator.

2. Case Report

A 3-day-old male neonate with unilateral cleft lip and palate was referred to the Department of Prosthodontics, HP Government Dental College and Hospital, Shimla with chief complaint of inability in feeding milk. The patient was being fed with orogastric intubation.

The medical history of the child and parents was non significant. On general examination, the neonate was found to be moderately built, with a birth weight of 2.6 kg. Extra-oral (Fig.1) examination of the child showed unilateral cleft lip-left side. Intra oral (Fig.2) examination of the baby revealed a large cleft on the left side of the alveolus and hard palate, that extended to the soft palate: Veau's classification, Class III. Since the baby was not scheduled for corrective surgery in near future, it was decided to fabricate a feeding feeding obturator. Its benefits were explained to his parents and the parents approved this treatment plan.

A prefabricated perforated impression tray (Fig.3) of autopolymerizing acrylic resin was selected, evaluated intraorally and was adjusted in accordance with defect of the patient (Fig.4). Polyvinyl siloxane putty impression material was mixed, and the loaded impression tray was seated in patient's mouth until the impression material adequately covered the anatomy of the upper gum pads. Once the impression material was set, the tray was removed, impression (Fig.5) was evaluated for its completeness and the mouth was examined for any residual impression material. During impression making the infant was held with his face towards the floor in order to avoid aspiration. To

ensure a patent airway continuously throughout the procedure, it was noted that the infant was crying during the impression-making procedure. Master cast (Fig.6) was prepared with the Type III dental stone. The master cast was inspected for any significant undercuts in the cleft area, which were blocked with wax. Separating media was applied on the cast. The feeding obturator (Fig.7) was fabricated using autopolymerizing acrylic resin, following sprinkle on method of polymerisation. Dental floss (Fig.8) was attached to appliance during polymerisation, to provide a safety mechanism in case of gagging or accidental swallowing.

All the borders of the appliance were rounded and polished in order to avoid trauma. Feeding obturator (Fig.9) was inserted into patient's mouth and it was checked for fit, comfort and retention. Final finishing and polishing of the feeding plate was done before delivering the prosthesis. The appliance was placed in infant's oral cavity and patient's mother was asked to feed the baby and it was noted that there was no nasal regurgitation and child was successfully able to feed with the feeding obturator in place without any discomfort.

The whole process of impression making, fabrication of feeding obturator and insertion was done in a single day. Instructions were given to the parents on how to insert, remove, and clean the prosthesis. They were also instructed to thoroughly clean the baby's oral cavity and cleft with a soft cloth soaked in warm water after every feed. The patient was seen after 24 hours for adjustment, and then patient was followed up regularly after 3 month interval. During the regular follow up, neonate weight gain was evident.



Figure 3: Prefabricated perforated impression tray of autopolymerizing resin



Figure 4: Tray adjusted in accordance with defect of the patient



Figure 5: Polyvinyl siloxane putty impression of the cleft



Figure 1: Extraoral view of the cleft



Figure 6: Master cast fabricated in type III dental stone



Figure 2: Intraoral view of the cleft



Figure 7: Feeding obturator with master cast



Figure 8: Dental floss attached to the appliance



Figure 9: Feeding obturator in patient's mouth

3. Discussion

CLP runs in families and predilection for some races has also been documented.¹ Clefts 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 sequence, Treacher Collins Malformation, trisomies 13 and 18, Apert's syndrome, Stickler's syndrome, as well as Waardenburg's syndrome.⁸ Non-syndromic cleft lip and palate is reported to occur in approximately 1 in 700 live births,^{4,6,9,10} Male child has two times more predilection for CLP compared to female.¹ among the unilateral clefts, clefts involving the left side are more common (70% of the cases).²

Neonates with a cleft palate have difficulty in feeding^{2,5,7} because the oro-nasal communication diminishes the ability to create negative pressure which is necessary for suckling. In such condition, the baby presses the nipple between tongue and hard palate to squeeze the milk, but this mechanism will fail if cleft is wide and the nipple gets trapped inside the defect. The feeding process is also complicated by nasal regurgitation of food, excessive air intake which leads to frequent choking. Feeding time is significantly longer which causes parental anxiety and it fatigues both baby as well as mother.^{5,7}

Literature suggests different approaches to resolve neonatal feeding problems. Specially designed nipples with enlarged openings can increase the ejection of milk with reduced effort. Squeezable bottles appear easier to use than rigid feeding bottles. However, these options are not sufficient for

large clefts. Orogastric and nasogastric tubes can be effective but should be used only for a limited length of time. Surgery may completely close the oronasal communication and resolve the problems associated with the cleft.^{1,5,7} However, the timing of surgery differs, it may be as early as 10 to 12 weeks of age or 12 to 18 months or even well past 12 months of age.^{7,11,12}

Palatal obturator is a definite help to the feeding of an infant.¹ It creates a rigid platform toward which the baby can press the nipple and extract milk.^{4,11} It facilitates feeding, reduce nasal regurgitation^{3,11,12} and the incidence of choking, and shortens the length of the time required for the feeding.¹² The obturator also prevents the tongue from entering the defect and interfering with the spontaneous growth of the palatal shelves towards midline. The obturator reduces the passage of food into nasopharynx, reducing the incidence of otitis media and nasopharyngeal infections.^{7,11,12}

A major concern in treating these patients is obtaining good impressions, which pose a unique set of challenges including the size constraints imposed by the infant's oral cavity, anatomical variations associated with the severity of cleft and a lack of ability of the infant to cooperate and respond to commands.⁵ A number of positions have been adopted for cleft palate impression making in infants, includes prone, face down, upright, and even upside down.^{1,11} The impression tray should be of adequate size to cover entire maxilla and cleft palate defect. Prefabricated trays those are commercially available for making impression of an infant with a cleft palate. Ice cream sticks can also be used to carry impression materials for infant impressions. The impression materials can be supported with the fingers and placed in the patient's mouth till the material completely sets.¹¹

Various impression materials like alginate, low fusing impression compound and elastomeric (rubber base) impression materials have been routinely employed for making impression of neonate with CLP. The alginate material is not suitable for making these impressions as this has potential to tear due to low tear strength. Low fusing impression compound is a thermoplastic material, sometimes it can cause burn and volatile contents are released from this which have potential to be health hazard to the neonate. Elastomeric impression materials are better suited in making of cleft impression due to its good elastic behavior, high tear strength, accurate reproduction of surface details and long-term dimensional stability which allows multiple pour.¹

Feeding obturator can be prepared with various materials like acrylic resin, visible light cured acrylic, acrylic polymer, silicones,¹ vacuum formed polyethylene. Vacuum formed materials are light in weight, soft in nature with smoother surface, and don't require any retentive wire. But they are not economical and oral hygiene is also a concern because it is a plastic appliance, which can cause irritation to the palate.⁵ Auto-polymerizing acrylic resin material was chosen to fabricate feeding obturator as it is easily available, cost effective, simple to fabricate, hygienic, has good strength and can be fabricated with thin margin.

4. Summary

This clinical report describes a method for the single visit fabrication of a feeding obturator for a 3 day old neonate with cleft lip, using a prefabricated acrylic tray for making impression. Feeding the cleft lip and palate infant poses challenges to the parents. Feeding obturator helps in minimizing the feeding problems in cleft lip and palate patients. It normalizes tongue position resulting in better speech, aids in better esthetics, reduces feeding time, provides positive psychological impact on the parents and promotes neonatal weight gain which is important in preparing the baby for corrective surgery.

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