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Research Paper

Feeding Plate for The Management of Neonate Born With Cleft Lip and Palate

Medical Science

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ABSTRACT

Cleft lip and palate is most common congenital anomalies of craniofacial region. Cleft lip and palate is a single anomaly and its possible consequence affects several systems and functions that include facial growth, dentition, speech, hearing and genetic aspects because of the complex mode of inheritance. Feeding problems frequently associated with cleft lip and palate neonate which make it difficult for the infant to maintain adequate nutrition. This clinical report describes fabrication of feeding plate for neonate born with cleft lip and palate.

1. Introduction

Cleft lip and palate is the most common of the craniofacial congenital anomalies that have an incidence of 0.28 to 3.74 per 1000 live birth globally. Many of these congenital anomalies appear to be genetically determined or are attributable to teratogenic influences [1]. These clefts can be ranges from a slight notch in the lip, to complete separation, and can involve the different regions of the orofacial complex, either independently or in combination [2]. Cleft lip and palate is a single anomaly and its possible consequence affects several systems and functions that include facial growth, dentition, speech, hearing and genetic aspects because of the complex mode of inheritance [3]. Child born with cleft lips and palates have many problems that need to be solved for successful rehabilitation by a multidisplinary team approach [4].

In the early stages after birth, an infant with a cleft lip and palate is not an immediate orthodontic or surgical problem; however is pediatric concern because the infant must be fed to maintain adequate nutritional intake. This is important to increase the resistance to infection, to promote adequate weight gain to allow for surgical correction, to help build strength to meet stress of the surgery and to promote healing after the surgery is completed [5].

Management of the patient with a cleft begins with immediate attention to the need of the newborn. Feeding problems are often associated with cleft anomalies, which make it difficult for the infant to maintain adequate nutrition. These problems include insufficient suction to pull milk from the nipple, excessive air intake during feeding, choking, nasal discharge, and excessive time required to take nourishment [6].

Specialized feeding devices which have been proven to be beneficial in these infants.

The feeding plate is a prosthetic aid that is designed to obturate the cleft and restore 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 facilitate feeding, reduce nasal regurgitation and the incidence of chocking, and shortens the length of the time required for the feeding. 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 nasopharyanx, reducing the incidence of Otis media and nasopharyngeal infections [7].

The present case report shows Prosthodontic management of neonate born with cleft lip and palate by fabricating feeding plate.

2. Case Report

A 14 day old baby boy with his mother was refereed to department of Prosthodontics, MIDSR Dental College and Hospital, Latur India; His mother complaint of inability in feeding milk and nasal discharge during feeding milk.

On general examination, the neonate was found to be moderately built,with a birth wight of 2.5 kg.(figure-1.A).On clinical examination bilateral cleft of lip and hard palate extended to soft palate with nasal deformity and displaced alveolar segment. Neonatal maxillary left central incisor tooth (figure-1.B). No other associated syndrome was found.

Since baby was not scheduled for corrective surgery in the near future, it was decided to construct a feeding plate. Its benefits were explained to his parents and a written, informed parental consent was obtained.

Preliminary impression of the palate was made with an impression compound and low fusing impression compound (green stick). First the impression compound and green stick was soften in warm water and kneaded. With a finger impression material carried into the baby's mouth and pressed the material against the hard palate and into the buccal and labial vestibules, while the baby was held in prone position, in order to prevent aspiration in the event of vomiting and asphyxiation due to airway obstruction (figure-2).

A primary model was prepared by pouring the impression in type III dental stone. The cleft defect in the primary model was blocked out by modeling wax and a special tray was fabricated using auto polymerizing acrylic resin.

Special tray was Evaluated intraorally and Determined the easiest path of insertion, final impression was made with the special tray using addition silicone impression material (figure-3).

A master cast was prepared using die stone (figure-4). A feeding plate was fabricated using clear acrylic resin material.

All the border of the feeding plate were rounded and polished in order to avoid trauma. Two perforations were made on the peripherals of feeding plate for retention of floss thread (Figure-5).

Feeding plate was inserted into patients mouth and it was checked for fit, comfort and retention (Figure6,7).

Instructions were given to the parents on how to insert, remove, and clean the prosthesis. Parents were given Instruction regarding how to use the obturator during feeding time, remove it after words, and thoroughly clean the baby's oral cavity and cleft with a soft cloth soaked in warm water. The patient was seen after 24 hour later for adjustment, and then patient was followed up regularly after 3 month interval.

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Figure1: Neonate with Bilateral cleft lip and palate



A-Extraoral View



B- Intraoral view

Figure 2: Primary impression

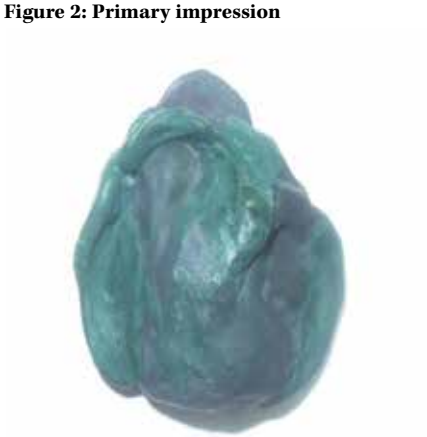


Figure 3: Final impression made with a silicone impression material



Figure 4: Final cast



Figure 5: Feeding plate made with clear acrylic resin



Figure 6: Neonate wearing the Feeding plate



Figure 7: feeding with the help of appliance



3. Discussion

Cleft lip and palate are common congenital abnormalities of the orofacial region. The oronasal communication due to the defect poses great problems for the neonate in the suckling of milk and it may affect the overall physical and mental growth of the child. The rehabilitation of such neonate primarily involves closure of the defect [8].

Surgery may completely close the oronasal communication and resolve problems associated with the cleft. However, timing of surgery differs significantly between medical centers and may be as early as 10 to 12 weeks of age or 12 to 18 months or even well past 12 months of age [7,9].

McNeil and other authors advocated various prosthetic appliances, both active and passive for the treatment of infants born with cleft lip and palate. One such prosthesis, an intraoral maxillary obturator, has proved beneficial by providing the feeding plate [10].

Advantages of feeding plate are [10]

Provides a false palate against which the infant can suck, reduces the incidence of feeding difficulties in newborns, and helps maintain adequate nutrition

Provides cross arch stability and prevents arch collapse after definitive cheiloplasty

Provides maxillary orthopedic molding of the cleft segments into approximation before primary alveolar cleft bone grafting

The making of impression in an infant with a cleft palate is a critical procedure. A number of positions have been adopted for cleft palate impression making in infants, includes prone, face down, upright, and even upside down. 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. Materials used for the impression includes thermoplastic low fusing and medium fusing impression compound, heavy body silicone impression material and alginate have been routinely used for making impressions of neonates with oro-facial clefts. The putty wash impression can produce accurate impressions with good reproduction of the details and its biggest advantage is its greater tear strength and the possibility of making multiple casts with the same impression [11].

In the study by Jones, maxillary obturators were constructed to facilitate feeding for 51 infants with unilateral or bilateral cleft lip and palate. these infants had continuously experienced feeding difficulties before obturator therapy. After the infants had worn the obturator for at least 8 months, parents reported that they were more comfortable while feeding their infants and that nasal discharge was reduced. The time required for feeding and the difficulty experienced by the parents were also reduced [12].

Not all the clinicians who work with infants with cleft lips and palate advocate use of prosthetic feeding appliances. Some believe that such appliances are not effective in facilitating feeding. Pashayan and McNab recommended using a standard nipple that has been large crosscut. This enlarged cut provides improved ejection of the milk into the infant's mouth with a minimum effort [13].

4. Conclusion

This article describes a method for the fabrication of a feeding plate for a neonate with cleft lip and palate. The feeding plate can be effective in overcoming some of the feeding problems associated with a cleft palate defect. Feeding plate prosthesis may also reduce the stress of both parents and the baby experience with the feeding process and promote neonate weight gain which is important in preparing the baby for surgery. The feeding plate needs to be re-fabricated regularly due to the overall slow but constant growth of palate; which offers an interim treatment option till the palatal defect closed surgically.

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