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FABRICATION OF FEEDING OBTURATOR IN CLEFT PALATE PATIENT

Dental Science

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ABSTRACT

Cleft palate is a birth defect occurring in the orofacial region. The cleft palate is associated with feeding difficulties, Eustachian tube dysfunction, middle ear infections, hearing loss, speech disorders, dental and orthodontic problems. Feeding plate is a prosthetic aid that is designed to seal the cleft and restore the separation between oral and nasal cavities. This article presents a case report of a neonate with cleft palate in whom a feeding plate was delivered.

KEYWORDS

Cleft palate, middle ear infections, Feeding plate

INTRODUCTION

Cleft palate can be defined as a furrow in the palatal vault.[1] Facial cleft occur due to genetic and environmental causes. Essentially, a cleft is caused by hypoplasia, abnormal directional growth of mesenchymal process, or failure of fusion or breakdown of fusion of mesenchymal process.[2] Essentially, a cleft is caused by hypoplasia, abnormal directional growth of mesenchymal process, or failure of fusion or breakdown of fusion of mesenchymal process[2]The general prevalence of cleft lip with or without cleft palate is believed to be 1 case per 750 live births.Cleft lip with or without cleft palate is observed more frequently in males, while isolated cleft palate is more typically seen in females. The majority of CL/P (70%) are regarded as non-syndromic, where the clefts occur without other anomalies. It appear to be caused by an interaction between individual's genes and environmental factors.

There are numerous problems associated with individuals with a cleft lip or palate, which affects the functions performed by the oral and nasal cavities.[3] The foremost problem would be feeding the infant as there will be no sufficient negative intraoral pressure to prevent regurgitation of food into the nasal cavity.[3] They are unable to separate the nasal cavity from the oral cavity and therefore cannot create the negative pressure necessary for sucking. Problem faced is the regurgitation of milk through nose which can be resolved by raising child's head around 45^{0}. Also limiting feeding time (e.g., no more than 30 minutes) to avoid fatigue (Dailey, 2013; Peterson-Falzone et al., 2010, 2016)[4]

A feeding obturator is a device that creates a seal between the oral and nasal cavities and controls the flow of milk. It is given from birth to 3 months. Feeding device is inserted over the infant's hard palate, which allows him or her to compress the nipple easier because it provides a contact point and helps the infant to express milk.

This case report aims at providing an overview of the management of a cleft lip and palate patient with emphasis on the role of a pedodontist.

CASE REPORT

A 2 months-old female infant was referred to the Department of Pedodontics with parents complaining of difficulty in suckling of milk. Family history revealed that parents and the maternal grandparents had no consanguineous marriage. Intraoral examination of the child revealed Veus' Class II classification (cleft of hard and soft palate). (Fig1)

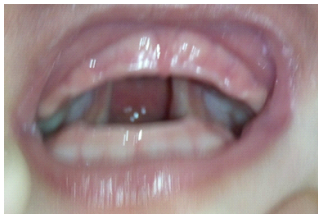

Fig: 1 Cleft of hard and soft palate

Primary Impression

The impression was made when the infant was fully awake without any anesthesia or premedication. The infant was held face down to prevent the possible aspiration of regurgitated stomach contents. The tray was placed until impression material just begins to extrude from the posterior border (Grayson and Maull). Putty consistency polyvinyl elastomeric impression was made. (Fig 2)

Fig:2 Primary impression and dental cast

Cast preparation

Primary cast was poured with dental stone. The cleft region of the palate and alveolus were adapted with wax to approximate the contour and on which a custom acrylic tray was prepared. The tray was smoothened and polished to avoid rough areas.(Fig 3)

Fig: 3 Formation of custom tray

Secondary impression

In the next appointment, elastomeric putty material was loaded onto the custom tray and impression obtained.(Fig 4)

Fig:4 Secondary impression made

Master cast

Master cast was poured with dental stone.(Fig 5)

Fig: 5 Final cast made

Obturator

All the under cuts were blocked with the wax. While fabricating obturator "Sprinkle method" was used. The obturator was carefully fitted in the infant's oral cavity during the time of delivery and floss was used for its guidance. (Fig 6)

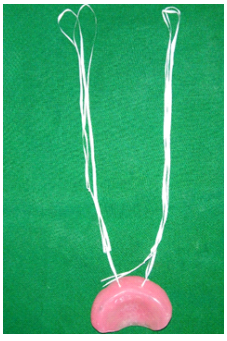

Fig: 6 Feeding obtuartor

Instructions to parents

Parents were instructed on placement and removal of the appliance and its daily cleaning under running water after each feed.Also small amount of 2- 3 teaspoon of sterile water should be used to clean the mouth and palate. (Fig 7)

Fig: 7 Placement of feeding obturator

Patient was recalled after a week followed by 1 month, 2 months, 3 months. The oral cavity was examined for any possible sores or ulcerations in areas other than where molding force was applied.

DISCUSSION

Non-syndromic cleft lip and palate is a complex genetic disorder with variable phenotype, largely attributed to the interactions of the environment and multiple genes, each potentially having certain effects. Non-syndromic CL/P is a common craniofacial malformation with a complex genetic component.[5] Approximately 70% of CL/P cases are non-syndromic occurring as an isolated condition unassociated with any recognizable anomalies, while the remaining 30% are of syndromic cases present in association with deficits or structural abnormalities occurring outside the region of the cleft.[6]

A study was conducted in 2001 in the state of Andhra Pradesh, India found that 65% of the children born with clefts were males. The distribution of the type of cleft showed 33% had CL, 64% had CLP, 2% had CP and 1% had rare craniofacial clefts.[7]

Potential problems associated with feeding difficulties include fatigue due to excessive energy expended during feeding, insufficient suction, poor weight gain due to inadequate nutritional intake; choking, excessive air intake, excessive time required to feed, nasal regurgitation. Children with cleft of soft palate are predisposed to middle ear infections and associated conductive hearing loss because of eustachian tube malfunction. Dhillon describes a 97% incidence of otitis media with effusion in children with cleft palate, less than 24 months of age.Velopharyngeal inadequacy (VPI; also referred to as velopharyngeal dysfunction [VPD]) may result from palatal clefting. And can cause hypernasality (a resonance disorder), nasal air emission, or both.

Breastfeeding should be encouraged. Breast feeding should be limited to a 10 minute session. Feeding by bottle rather than spoon is much more natural for the baby and encourages the biting action of the lower lip and jaw function and development.

The feeding plate or the passive maxillary obturator is a passive prosthetic appliance that is used to restore the palatal cleft and aid in creating sufficient negative pressure, which allow adequate sucking of milk. Neonatal feeding obturator appliance is traditionally fabricated of acrylic resin that serves the following purposes:[8,9,10,11,12]

- Creates a rigid platform, towards which the child can press the nipple and feed
- Reduces nasal regurgitation
- Reduces the time required for feeding
- Helps position the tongue away from the cleft area in the correct position to allow spontaneous growth of palatal shelves towards each other
- Reduces parents' frustration as a result of feeding problems.

The feeding plate is to be given before the patient goes for the first surgery of palatal repair. Prior to the surgery, patient has to come every month for the modification in their feeding appliance, if required.

Thus the comprehensive management of children born with cleft lip and palate is best accomplished by the multidisciplinary team approach. As a team member, pedodontists are expected to keep abreast of new and innovative treatment options to assure the most current care available.

CONCLUSION

A feeding appliance separates the oral cavity from the nasal cavity and is of great help in feeding by closing the defect of hard/soft palate that may affect speech production or cause nasal regurgitation and also allows better maxillary growth before surgery. Thus it act as a stumbling block in the milestones of normal development.

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