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Case Report

A Feeding Appliance for an Infant with Cleft Palate

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Summary:

Cleft palate and cleft lip are the most common congenital deformities involving the orofacial region. One of the most important problems with this deformation is difficulties with feeding due to lack of sufficient negative intraoral pressure which prevents regurgitation of food into the nasal cavity. Cleft lip and cleft palate can be surgically treated but repair of the palate is usually delayed until 6 months to 2 years of age. Early repair of the palate may have a negative effect on the growth and development of maxilla due to the resulting scar tissue.

This article presents the Prosthodontic management of an infant with a cleft palate through fabricating a feeding plate (palatal obturator).

Keywords: Cleft palate, Feeding plate, Palatal obturator

Introduction

Cleft palate and cleft lip are the most common congenital deformities involving the orofacial region.

Cleft pathogenesis processes during the embryonic period and incidences for 0.28-3.74 per 1000 live births [1][2]. This is the result of genetic and environmental causes [3].

Patients with cleft lip and palate have many problems associated with oral and nasal cavity function.

One of the most important problems with this deformation is difficulties with feeding due to lack of sufficient negative intraoral pressure which prevents regurgitation of food into the nasal cavity [4]. Nasopharyngeal infections and otitis media are also frequent complications of food regurgitation [5].

Cleft lip and cleft palate can be surgically treated but repair of the palate is usually delayed until 6 months to 2 years of

age. Early repair of the palate may have a negative effect on the growth and development of maxilla due to the resulting scar tissue [6]. Orogastric and nasogastric feeding tubes may be effective but should be used only for limited duration (because of the risk of perforation, pulmonary complication, nasal alar ulceration or necrosis and the risk of esophagitis and gastritis [7][8]). Percutaneous endoscopic gastrostomy tube placement is an invaluable tool in clinical practice but there is a big risk of complications: pneumonia, peritonitis, perforation, colon injury, gastro-colo-cutaneous fistula, liver injury, abscess and wound infection, gastrointestinal bleeding and ulceration, ileus and gastroparesis [9]. The other solution is - a feeding plate (palatal obturator). It obturates the cleft and restores the separation between the oral and nasal cavities, creating negative intraoral pressure during feeding [10]. A feeding plate reduces the incidence of choking, prevents the tongue from entering defect, reduces nasal regurgitation and helps to stop the growth of palatal shelves [10][11]. It also helps to position the tongue in the correct position to perform its functional role in the development of the jaw [12]. During breast sucking, the oral muscles are being stimulated, increasing tonus, and promoting the correct position to perform the chewing function in the future [13][14] state that infant's mandibular division is vertically short and the chin prominence is incomplete. Muscles stimulation during breastfeeding plays important role in mandibular growth, establishing a harmonious relationship with the maxilla [13].

This article presents the Prosthodontic management of an infant with a cleft palate through fabricating a feeding plate.

Case Report

The patient (Figure 1) was a 3 week old female born with a cleft palate (Veau classification, Class II) in the 36th week of the gestation period. Her weight was 2700g. Because of poor

feeding, the mother and infant were admitted to the hospital.



Figure 1: Infant with cleft palate.

Diagnosis: Pierre Robin syndrome (micrognathia, short frenulum of the tongue and palatal defect).

The infant had a sucking reflex but could only swallow 10-15ml during one feeding (remaining feeding formula was fed via nasogastric tube).

We were planning to fabricate a feeding plate and use it until the cleft repair surgery was to be performed.

Technique

A preliminary impression of the maxillary arch was made with warm wax. It was used for making an individual tray. The final impression was made by using an individual tray with polyvinyl siloxane putty material (Figure 2).

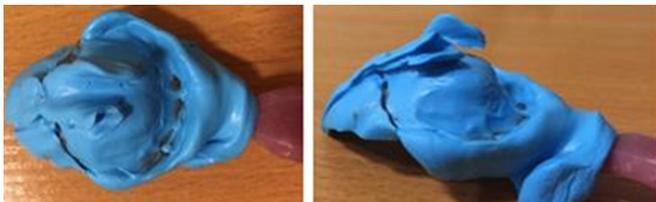


Figure 2: Final impression.

The feeding plate was planned (Figure 3) on a final cast that was poured into Type III dental stone. It was made with heat-cured acrylic resin (Figure 4).



Figure 3: Feeding plate model.



Figure 4: Feeding plate/ palatal obturator.

Dental floss was attached to the obturator to allow for easier removal and to avoid accidental swallowing. The appliance was positioned in the infant mouth. The mother was instructed on: use of the obturator, its placement, removal and cleaning.

Discussion

Maintaining healthy and balanced nutrition is very important for normal infant growth. In this case, the cleft palate included all of the soft palate. Infants with the same clefts have velopharyngeal dysfunction (a term describing an inappropriate function of velopharyngeal (VP) port which consists of the lateral and posterior pharyngeal walls and the soft palate). This muscular valve can control the air passage between oro- and nasopharynx. When the proper closure cannot be performed, the individual can experience: liquid regurgitation during swallowing, nasal air emission, hyper-nasality and unintelligible speech [15].

An obturator restores the palatal cleft and helps to make negative pressure that is important for sucking and swallowing. Different devices have been used to improve feeding with a cleft palate (syringe feeding, Haberman feeder, Hotz plate, nasogastric tubes). In the presented case, a modified feeding plate was constructed using hard, heat-cured acrylic resin [16] reported that the effect of lip and palatal surgery was much better than the effect of infant orthopedics. However, palatal surgery can only be performed on infants between 6 and 12 months of age. Orthopedic treatment is an initial solution prior to surgical treatment.

A feeding plate not only helps to solve feeding problems, but also prevents the tongue from entering the cleft area and moves the palatal segments closer to their normal relation [4],[17].

A disadvantage of the feeding plate is the rigid bulb that cannot move with soft palate during swallowing. It can also be

challenging to determine the proper distance between the bulb and posterior pharyngeal wall to prevent regurgitation. In this case, the infant could swallow more than 60 ml of milk during one feeding with the feeding plate installed. Before placement it was only 10-15 ml.

There are some articles about two-piece obturator using “lock-and-key” [18] mechanism but in our case this design was too difficult and complicated for an infant. The design of our obturator helps to “lock” it in to the mouth - the upper part holds strongly into nasal cavity because of the negative angles (Figure 4). We would like to realign the feeding plate every month to adjust for the infant’s growing maxilla.

Conclusion

It is believed that this feeding plate has many advantages and helps to avoid the gastrostomy. Feeding plate stimulates the development of mandibula, which is too small because of the Pierre Robin syndrome, and can be used routinely as the initial treatment before surgery.

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