

Prosthetic Management of Nasoalveolar Clefts in Newborns: A Series of Case Reports

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Abstract Orofacial clefts are congenital deformities that manifest at birth causing difficulty in breathing and feeding. The severity depends on the extent of involvement that can include lip, alveolar ridge, hard palate and soft palate. Prosthodontic management poses a great challenge due to lack of cooperation from the patient and the inadequate size of oral cavity. Two case reports of prosthodontic management of nasoalveolar clefts that were treated in our department are presented.

Keywords Cleft lip and palate · Feeding obturator · Nasoalveolar cleft

Introduction

Overall incidence of cleft lip and palate is 1:700 in live human births [1, 2] Cleft lip occurs in 20–30% of cases, cleft lip and palate in 35–50% and cleft palate alone in 30–45% [3]. In India, a survey conducted by Christian Medical College, Vellore reported incidence of cleft lip and palate in the regional population as 1:639. Sex prediction shows male to female ratio as 3:2. Incidence of cleft lip is common in males and cleft palate in females.

Etiology could be either hereditary or environmental. Genetically defects are male sex linked recessive. Environmental factors that influence in the first trimester of

pregnancy are viral infections, exposure to radiation and influence of drugs like excessive use of antibiotics, steroids, insulin and anti epileptic drug. Other factors include deficiency of vitamin A and B, anemia and anorexia.

A congenital orofacial cleft that manifests at birth affects facial esthetics, speech, mastication, deglutition and ultimately leads to impairment in dental occlusion. Abnormal oral habit like tongue thrusting is commonly associated as compensatory mechanism to seal the defect. The treatment of cleft lip and palate patients is multidisciplinary and requires the involvement of a surgeon, prosthodontist, speech therapist, pediatrician, orthodontist, ENT specialist and psychologist [4, 5].

Problems caused by abnormal growth and development require early medical and surgical intervention. Surgical treatment starts at around the age of 2–3 months, in order to shift the protruding premaxilla to a more distal position that aids in sucking [6]. Meantime prosthetic treatment is planned to facilitate feeding by developing normal sucking reflex and to prevent any abnormal tongue and oral habits which may affect normal speech development.

Case Reports

Case Report 1

A 12 day old baby boy, weighing 2.2 kg with cleft palate was referred to our department for prosthetic intervention. Parent's chief complaint was difficulty in feeding due to nasal regurgitation. History revealed the possible cause was due to consensual marriage. Baby was provisionally diagnosed of having Pierre Robin's Syndrome. The syndrome is characterized by an unusually small mandible (micrognathia), posterior displacement or retraction of the

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Fig. 1 Case 1, intra oral view



Fig. 2 Case 1, Impression

tongue (glossoptosis) and upper airway obstruction. Incomplete closure of the roof of the mouth (cleft palate) is present in majority of patients and is commonly U-shaped.

Intraoral examination revealed cleft at the junction of hard and soft palate involving the whole of soft palate measuring approximately 1 cm in length and 1.8 cm in width (Fig. 1). Since the surgical treatment was planned after 6 months, prosthetic intervention was must.

Impression of the defect was made using Aquasil (Very High Viscosity Polyvinylsiloxane Impression Material-Patent 5955513). Aquasil is a very high viscosity impression material with optimum flexibility for easy removal from undercuts (Fig. 2). Before making impression, we advised the guardian to hold baby's head upright to prevent



Fig. 3 Case 1, Master cast with wax pattern



Fig. 4 Case 1, Heat cure prosthesis

choking of impression material in the throat and to prevent difficulty in breathing. Beading and boxing of the impression was made to obtain master cast in die stone. Outline of the prosthesis was marked and wax up was done accordingly using modeling wax (Fig. 3). Wax pattern was flaked and cured by conventional method to obtain heat cure acrylic resin prosthesis. After curing the prosthesis was retrieved; excess resin was trimmed and prosthesis was finished and polished (Fig. 4). The prosthesis was stored overnight under water to reduce residual monomer. Next day the prosthesis was tried in baby's mouth, adjusted for accurate fit and delivered (Fig. 5).



Fig. 5 Case 1, Prosthesis in place



Fig. 7 Case 2, Impression



Fig. 6 Case 2, Extra oral view

Case Report 2

Two month old baby boy weighing 1.2 kg reported to our department with similar complaints. On examination baby was underweight for his age due to difficulty in feeding. Extra oral examination showed deviated nasal septum on the right side causing gross facial asymmetry. Intra oral examination showed defect located on the left side of premaxillary region involving upper lip, alveolus, hard palate and soft palate (Fig. 6). Baby had developed compensatory tongue thrusting habit to seal the defect. Prosthetic intervention was planned as immediate treatment since the surgery was postponed as the baby was underweight. Prosthetic rehabilitation was aimed at closing the defect to facilitate proper feeding and to prevent nasal regurgitation and also to break abnormal oral habit. Heat cure prosthesis (Figs. 7, 8, 9) was fabricated in the similar manner as that of the first case. Prosthesis was checked in



Fig. 8 Case 2, Master cast with wax pattern

patient's mouth for fit and for any airway obstruction. A groove was made in the prosthesis to prevent obstruction to the air passage (Fig. 10).

Discussion

Surgical delay is sometimes inevitable in cases with cleft lip and palate, mainly because of the health of the baby. Prosthetic rehabilitation becomes imperative to facilitate feeding and to improve baby's health. Factors that complicate such prosthetic intervention are:



Fig. 9 Case 2, Heat cure prosthesis



Fig. 10 Case 2, Prosthesis in place

- Difficulty in impression making due to lack of cooperation of the baby and restricted size of oral cavity.
- Retention of the prosthesis.
- Psychological aspect involving the parents.

Use of elastomeric impression material is advantageous because of its high viscosity, its non irritant nature and adequate setting time. Heat cure acrylic resin is preferred over self cure acrylic resin because of its long polymerization cycle that allows minimizing the amount of residual monomer content and makes it hypoallergenic in nature. Retention of prosthesis in new born is always a problem considering the age of the patient and the risk of aspiration; therefore, mechanical means of retention is a must in these cases. In these cases prosthesis was tied with nylon thread

that could be tied around the head of the baby or can even be wrapped around mother's finger during feeding to prevent aspiration.

Post insertion follow up is important as corrections have to be made depending on the growth of the oral cavity. Also if the prosthesis becomes loose it can be relined using silicone based denture relining materials like Ufigel C, Ufigel P, Mollosil, Molloplast B, Permafix, Permaflex, etc.

Success of the prosthesis depends on educating the parents on the use of the prosthesis and its intended purpose. Feeding obturators mainly facilitate feeding by preventing nasal regurgitation and thus improves baby's health. Frequent follow up visits should be scheduled for any future adjustments required.

Prevention

Cleft Lip and Palate defects are most commonly seen in poor socio economic status group where consensual marriages are common. Educating people against consensual marriages goes a long way in reducing the incidence of cleft lip and palate.

Conclusion

Prosthetic intervention is needed as in many cases surgical intervention is planned at a much later stage. Prosthetic rehabilitation helps in facilitating feeding and thus improving the overall health of the patient.

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