

MANAGEMENT OF UNCORRECTED CLEFT LIP – AN INNOVATIVE PROSTHODONTIC APPROACH

¹G TASNEEM RAJI

²E ESHONA PEARL

³T SREELAL

⁴APARNA MOHAN

⁵GIRI CHANDRAMOHAN

ABSTRACT

Instances of uncorrected cleft lip in adult or elderly patients are still seen in rural areas or among the people who are unaware of its correction in the developing countries. Adult patients who did not receive proper treatment for cleft lip are challenging for clinicians in terms of prosthetic rehabilitation especially when the patient become edentulous. This paper presents the management and personal identity revival of a completely edentulous 54 year old patient with uncorrected bilateral cleft lip. The facial deformity was characterized by irregularities of upper lip, protruded and rotated central incisors in the pre-maxillary region with multiple missing teeth in the upper jaw and completely edentulous lower jaw. Complete Dentures were inserted following extraction of the central incisors and the remaining natural teeth in the upper jaw, along with a Lip prosthesis made out of silicone that is retained to the maxillary Complete Denture by means of magnets. The patient was very pleased with the improvement in speech and chewing and she approved of her facial esthetics. The existence of uncorrected cleft in the elderly population highlights the need to improve policies in treating patients with cleft lip, mainly in developing countries.

INTRODUCTION

Facial clefts occur along many planes of the face as a result of faults or defects in development or maturation of embryonic processes. These anomalies are recognized as oblique and transverse facial clefts, which extend from the upper lip or ala of the nose to the eye and from the angle of the mouth to the ear, respectively. By far the most important of the facial clefts is cleft lip. Usually Maxillary cleft lip can occur either due to failure of the globular portion of the median nasal process to unite properly with the lateral nasal and maxillary process or due to a failure of the mesodermal penetration and obliteration of ectodermal grooves separating these mesodermal masses leads to breakdown of the ectoderm causing cleft formation.¹ The etiology is complex and depends on genetic and

environmental factors. Some authors, argue that the cleft palate is caused by an alteration in the normal fusion process. They also identify other factors such as a defect in vascular supply to the region involved, a mechanical alteration in tongue size, intoxication with substances such as alcohol, drugs or toxins, and infections or lack of development. In contrast, some authors attribute it to a serious defect produced by a mutant gene, or a small defect caused by several genes.² Cleft Lip and palate is the most common congenital craniofacial anomaly. The increased knowledge in the nature of the defect and of the remedial measures that were helpful in allowing cleft lip and palate patients to achieve more normal participation in the community life has attracted various specialists to aid in their rehabilitation. This in turn has led to the development of different treatment philosophies. Cleft of Lip are treated with various surgeries. Associated with these surgical advantages there has also been a need for prosthesis since rehabilitation is not limited to anatomical repair of cleft. Depending on the type and extent of cleft, several functional and morphological aspects such as speech, hearing, developing of occlusion and craniofacial growth may be damaged and required intervention by multidisciplinary term at appropriate time for achievement of integral rehabilitation. Pros-

¹ G Tasneem Raji, Final Year Post Graduate Student

² E Eshona Pearl, Final Year Post Graduate student

³ T Sreelal, Professor & Head Of the Department

⁴ Aparna Mohan, Senior Lecturer

⁵ Giri Chandramohan, Reader, Department of Prosthodontics & Implantology, Sree Mookambika Institute of Dental Sciences, Kanyakumari District, Tamil Nadu, India.

Address for Correspondence: Dr G Tasneem Raji, 11/2 – Observatory Street, Ramavarmapuram, Nagercoil 629001. Kanyakumari district Tamil Nadu, India.

Email: tasneemraji@gmail.com

Received for Publication: January 11, 2016

Reviewed / Approved: January 30, 2016

thetic therapy, aids the patient in developing normal speech, promoting deglutition and mastication.³ The prevalence of cleft lip and palate among the general population depends on racial, ethnic and geographic origin, as well as on socio-economic status. It has been estimated to range from 1:500 to 1:2500 live births. Cleft lip occurs in 20-30% of cases, cleft lip and palate in 35-50% and cleft palate alone in 30-45%.²

Prosthetic treatment allows patients feel more normal, increases their self – esteem and offers them with greater opportunities for employment and for fulfilling their social potential.³ Various prosthetic choices are available for cleft patients with the development of osseointegrated implants, and the number of treatment options have further increased. The combination of bone grafting and implant – supported fixed or removable prostheses represents an invasive treatment approach whereas, a conventional fixed or removable prosthesis represents a more conservative alternative for patients who refuse surgical intervention.⁴ Lip Prosthesis: The aim of a facial prosthesis is to fulfill the esthetic needs of the patient and to improve the patient's quality of life. It is important that the patient be informed regarding the esthetics outcome. The rehabilitation of maxillary lip defects is a significant challenge in terms of creating retention. The advent of magnets has enhanced the dental practitioner's capabilities in this regard with a remarkably improved potential for increasing prosthesis stability and preserving tissue. Extra oral defects producing gross anatomical changes produces deformity and affects the body image of the individual. Creating facial prostheses to restore mid facial defects involves many challenges. Apart from making the patient socially vulnerable the lip defect prevents adequate speech and deglutition. The speech problems are mainly associated with bilabial and labiodental phonemes. With lack or compromised oral competency, leading to drying and crusting of the tissues in the area of the defect. The goals of prosthodontic treatment is to restore appearance and function.⁴ Prosthesis is especially useful in case of lost body parts, as reconstructive surgery cannot fully restore aesthetics. Various materials such as wood, clay, leather, enameled porcelain, and acrylic resin and silicone elastomers are used in the fabrication of extra oral prosthesis. Among these, acrylic resin and silicone are the most commonly used materials for rehabilitation. Maxillofacial prostheses require frequent replacement because the elastomers and its coloring agents undergo changes. Silicones can be easily characterized and presents great durability.⁵

CLINICAL — REPORT

A 54 year old female patient was referred to the Department of Prosthodontics and Implantology of Sree Mookambika Institute of Dental Sciences, Kulsekharan. The patient's clinical and radiographic examination revealed partially edentulous upper jaw with two central incisors that is rotated and protruded

from the pre – maxillary region, and few teeth present in the right quadrant which were periodontally compromised and had lower jaw with a bilateral cleft in the upper lip, which had not been previously corrected. The in eating, difficulty during mastication and speech (Fig 2). The patient was referred to the Department of Oral and Maxillofacial surgery for extraction of the remaining natural teeth that were periodontally compromised. The treatment plan was discussed and explained to the patient. The patient had a collapsed Vertical Dimension, following total extraction (Fig 3). The treatment plan was to fabricate a conventional maxillary and mandibular complete Denture, characterized to match the patient's complexion and a Lip prosthesis made out of RTV silicone that is to be retained to the maxillary complete Denture, by means of Magnets.

Primary impressions were made with addition silicone (Aquasil, Dentsply, Germany) for Maxillary and Mandibular jaw in order to record the cleft that extends to the upper lip from the maxillary arch (Fig 4). The undercut areas present in the nasal region were blocked with gauze pieces which were dipped in saline. Topical anesthetic gel was applied on the undercut regions to reduce the discomfort level of the patient. Primary or Diagnostic casts were poured with dental plaster (Neelkanth Minecham, Rajasthan, India.) and special trays were made for maxillary and mandibular arch with autopolymerising resin (DPI company, Mumbai, India). Border moulding was done with green stick or low fusing compound (DPI company, Mumbai, India) and secondary impression was made with monophase silicone impression material (Aquasil, Dentsply, Germany) (Fig 5) Master cast was poured with Dental stone (Neelkanth Minecham, Rajasthan, India.) following beading and boxing of the border molded maxillary and mandibular special trays. The master casts were duplicated with alginate and heat cure denture base was fabricated for maxillary and mandibular arch, with heat activated acrylic resin (DPI company, Mumbai, India.) Maxillo-mandibular relationship was recorded following construction of occlusal rims using modelling wax (Modelling wax No. 2, The Hindusthan dental Products, Hyderabad, India) over the denture bases and were articulated in the mean value articulator (Fig 6). Teeth selection (Acryrock Teeth set, Italy) was done, based on patient's facial form, shape and shade. Anterior and posterior wax trial were done in the following appointments (Fig 7 & Fig 8). After carving and polishing, final wax up was done in prior to laboratory procedures. The casts were de-articulated for flasking and dewaxing. Following this, characterization of the denture was done with the mixture of brown, white and yellow paints to the monomer in such a way, it matches the patient's complexion, checked in prior to the laboratory procedure. The heat cure resin was mixed with the tinted monomer. Once the dough stage is attained, it is packed and cured for 90 minutes. Following curing and bench curing, deflasking, trimming, finishing and



Fig: 1



Fig 2:



Fig 3: Following Total Extraction



Fig 4: Primary Impression



Fig 5: Secondary Impression



Fig 6: Jaw Relation



Fig 7: Anterior wax tryin



Fig 8: Posterior wax tryin



Fig 9: Characterized Dentures



Fig 10: Characterized CD on insertion



Fig 14: Complete Denture with Lip Prosthesis on Insertion

polishing were done to obtain a characterized maxillary and mandibular Complete Denture (Fig 9). This is then inserted to the patient (Fig 10). After a period of one month, the lip prosthesis was fabricated.



Fig 11: Impression of Face

Lip prosthesis: Facial impressions are done with irreversible hydrocolloid (Alginate - Algitek, DPI) to record the defect (the bilateral cleft), with the denture placed in the maxillary arch (Fig 11), and another impression was made by waxing up the defect using a hard baseplate wax. The undercut areas present in the nasal region were blocked with gauze pieces which were dipped in saline. Topical anesthetic gel was applied on the undercut regions to reduce the discomfort level of the patient. The impression was incorporated with gauze and plaster in order to stabilize it. Dental stone was poured on to the impression, in order to obtain a model (Fig 12). RTV silicone (MP Sai Enterprise Pvt Ltd., Mumbai, India) that is transparent is mixed by incorporating it with commercially available MFP pigments, in order to match it with the patient's skin. On applying petroleum jelly over the stone model with lip support, the silicone is added in increments on to the model. Lip prosthesis is thus fabricated (Fig 13). The tissue surface of the lip prosthesis and the upper complete denture is then incorporated with magnets (Samaritan magnets, US) on either sides. The silicone completely sets in room temperature after 24 hours' time. Then the Complete denture with lip prosthesis retained by magnets was inserted to the patient (Fig 14).



Fig 12: Stone model



Fig 13: Lip Prosthesis

DISCUSSION

The overall goals in the treatment of patients with cleft lip are rehabilitated adults, to perform well in the society and to fulfill their functional needs. Rehabilitation goals include acceptable speech and appearance, as well as proper occlusion and masticatory function. Management of cleft lip patients is initiated in early infancy and continues until the late teens or early adulthood. Dental specialists start contributing to the treatment of cleft lip and palate patients at an early age. Prosthetic restoration of missing teeth generally starts at later stages if necessary.⁶ Surgical repair in

early life is considered a powerful determinant for the type and extent of the prosthodontic treatment that will be required. When an adult cleft lip patient with no or improper treatment presents, reconstructive prosthodontic treatment with removable prosthesis serves as an important element. Prosthetic treatment of the patients with un-corrected cleft lip is a challenge and becomes even more challenging, especially when there are no teeth present to provide prosthetic retention. Moreover border sealing of these dentures could be compromised because of the bilateral cleft extending from the maxillary arch to the upper lip. Creating prosthesis, having realistic skin surface and seamless visual integration with the surrounding tissues, requires both artistic and technical skill.⁷ Prosthesis is especially useful in case of lost body parts, as reconstructive surgery cannot fully restore aesthetics. Various materials such as wood, clay, leather, enameled porcelain, and acrylic resin and silicone elastomers are used in the fabrication of extraoral prosthesis. Among these acrylic resin and silicone are the most commonly used materials for rehabilitation. Maxillofacial prostheses require frequent replacement because the elastomers and its coloring agents undergo changes. Silicones can be easily characterized and presents great durability. Creating facial prostheses to restore midfacial defects involves many challenges, including the achievement of proper retention and marginal fit. Adhesives, mechanical devices, tissue undercuts, and implants all have been used to retain facial prostheses. Soft tissues around midfacial defects may not be ideal for adhesive retention.⁶ Movement and range of motion of tissues adjacent to the defect inhibits the marginal adaptation of the prosthesis. Undercuts often provide insufficient retention, however, and they may cause soft tissue irritation. Maxillofacial prostheses retained by osseointegrated implants are esthetic and functional. Birnbach and Herman described the use of intraoral and extraoral devices to rehabilitate orofacial cancer patients. Retentive elements beyond what conventional adhesives offer often are required. For this reason the prosthesis given to patient describe in this case report was retained with mechanical retention through magnet.⁸ This prove to be successful as the prostheses could be easily inserted and removed, there was good retention, which gives a psychological advantage and confidence to patient to wear the prosthesis. Disadvantage of magnets are their detachability from the resin denture bases, so care was taken to overcome that by air abrasion of magnet with alumina and application of primer to increase the bonding with autopolymerizing resin.⁴ Dentures performed well in terms of stability

and retention, which enabled patients to function properly both during mastication and speech. In addition, after successful reconstruction of the cleft lip with RTV silicone, patient reported of improved and more comfortable function and esthetics.⁶

CONCLUSION

Today's standard of care for cleft lip patients minimizes the need for prosthetic treatment such as removable dentures. Even though it is rare, there are still some adult cleft lip patients who are in need of proper prosthetic care⁹. Restoration of mastication and esthetic appearance by dentures are regarded as therapeutic goals in these patients who have congenital malformations. This provides the patient self – confidence and a better quality of life. In the presented case, the characterized Complete Denture with lip prosthesis improved patient rehabilitation of the edentulous adult patients with cleft lip.⁶

REFERENCES

- 1 Sunitha Thomas, Shyam Mohan A., Rupesh P.L. Hybrid Maxillofacial Prosthesis: A Case Report. *J Indian Prosthodontic Soc.* 2010; 10(4): 253-56.
- 2 Silvia Sala Martí, M Dolores Merino Tessore, Tomás Escuin Henar. Prosthetic assessment in cleft lip and palate patients: A case report with oronasal communication. *Med Oral Patol Oral Cir Bucal* 2006; 11: E493-96.
- 3 Sowmya S, Shadakshari S, Ravi MB, Ganesh S, Anil Kumar Gujjari. Prosthodontic Care for Patients with Cleft Palate. *J Orofac Res* 2013; 3(1): 22-27.
- 4 Srinivasa B Rao, Sunil Kumar Gurram, Sunil Kumar Mishra, Ramesh Chowdhary. Magnet retained lip prosthesis in a geriatric patient. *J Indian Prosthodontic Society* 2015; 15(2): 187-90.
- 5 Wissem Khalil, Henrique Laboissière da Silva, Kátia Tavares Serafim, Luiz Evaristo Ricci Volpato, Luiz Fernando Passos Casela, Andreza Maria Fábio Aranha. Recovering the personal identity of an elderly patient with cleft lip: a case report.
- 6 Orhan Guven, Ayhan Gurbuz, Evre Baltal, Burak maz, Murat Hatipo. Surgical and Prosthetic Rehabilitation of Edentulous Adult Cleft Palate Patients by Dental Implants. *J Craniofac Surg* 2010; 21: 1538-41.
- 7 Rahat Ali, Peter J Nixon, Martin F W-Y Chan. Restorative Management of the Cleft Patient: CLP Series Part 10. *Ortho Update* 2014; 7: 42-47.
- 8 Jyotsna Murthy. Management of cleft lip and palate in adults. *Indian J Plastic Surg* 2009; 42(3): 116-22.
- 9 Peter D Hodgkinson, Susan Brown, Dorothy Duncan, Christine Grant, Amy Mcnaughton, Polly Thomas, Rye Mattick. C. Management Of Children With Cleft Lip And Palate: A Review Describing The Application Of Multidisciplinary Team Working In This Condition Based Upon The Experiences Of A Regional Cleft Lip And Palate Centre In The United Kingdom.