

Case Report

Mid Facial Defect Rehabilitation Using Extra Oral and Intraoral Prosthesis Retained by Magnets

Ashfaq Yaqoob¹, Rafi Tagoo², Umar Amin Malik³, Gowhar Yaqub⁴

¹Asst Professor CODS King Khalid University Abha Saudia Arabia

²Professor at CODS King Khalid University Abha Saudi Arabia

³Consultant Prosthodontist, MOI Jizan Saudi Arabia

⁴PG scholar OMR at Govt Dental College Srinagar India

Corresponding Author: Ashfaq Yaqoob

Received: 13/11/2016

Revised: 05/12/2016

Accepted: 20/12/2016

ABSTRACT

Mid facial defects with radical maxillectomy leading to extended defects in hard and soft tissues resulting in communication between oral cavity and orbit. These defects lead to aesthetic, functional and psychological problems.

This case report presents a technique for prosthetic rehabilitation of such defects using two piece prosthesis. A hollow bulb obturator and silicon orbital prosthesis with magnetic retention. Prosthesis improved the patients speech, mastication, swallowing and esthetics.

Key words: orbital prosthesis, magnet retained prosthesis, silicon prosthesis, obturator.

INTRODUCTION

Maxillofacial defects cause functional, esthetic and psychological impairments that adversely affects patients quality of life. Mid facial defects in particular affect patients' speech, mastication, quality of life, psychology, and social behavior. [1-4] Mid facial defects are facial defects that have an intraoral communication. Marunick et al. [5] classified mid facial defects into 2 major categories: midline mid facial defects, which include the nose and/or upper lip; and lateral defects, which include the cheek and orbital contents. Combinations of these 2 categories also exist. [6] These mid facial defects can be result of treatment of tumours, trauma, burns, congenital defects. [7] Large mid facial defects are rarely rehabilitated by surgical reconstruction alone. They usually require a facial prosthesis to restore function and esthetic. [8] In addition, an intraoral

prosthesis such as an obturator should restore speech and mastication deglutition by re-establishing oronasal separation. Fabrication of a facial prosthesis challenges the artistic ability of prosthodontists. On the other hand, size and weight of facial prostheses endanger the retention of them. Factors that affect the prosthetic prognosis for these patients are the size of defect, number of remaining teeth amount of remaining bony structure, quality of existing mucosa, radiation therapy, and patient's own ability to adapt to the prosthesis. [9] This clinical case report describes the prosthodontic rehabilitation of partially edentulous patient with a large mid facial lateral defect. The main aim of this rehabilitation was to provide the esthetic needs of the patient and to improve the patient's quality of life.

Clinical Report a 35 year old male patient (Fig.1) was referred after two

months of surgery for prosthetic rehabilitation of surgically excised left maxilla including the orbit on the ipsilateral

side along with its contents for an adenocarcinoma of left maxillary antrum.



Figure 1



Figure 2

On Extraoral examination, the patient revealed exenterated left eye and left facial asymmetry with loss of lip support. [Figure 1]

On intraoral examination, the patient revealed severe halitosis, atrophic oral mucosa, reduced salivary flow, and Aramany's Class I maxillary defect with extra-oral communication. The patient presented with generalized dentinal hypersensitivity and generalized periodontitis with poor oral hygiene. Based on history and clinical findings treatment plan was divided into three phases: Phase I included pre-prosthetic phase included oral prophylaxis, fluoridation, and improvement of oral hygiene. Phase II included fabrication of intraoral and extra oral prosthesis (6-10 months); phase III involved replacement with definite prosthesis depending on the overall response and general medical health of the patient. Treatment plan was explained to the patient and photographs, radiographs, and informed consent was obtained. Decision for prosthetic rehabilitation was undertaken after ruling out surgical reconstruction owing to the financial constraints.

Maxillary and mandibular impressions were made with irreversible hydrocolloid (Tropicalgin Chromatic, Zhermack, Badia Polsine, Italy) using stock

trays after moist gauze was packed to prevent the flow of impression material into the undesired areas of the defect and poured in type III dental stone (Kalstone, Kalabhai Karskarson Pvt. Ltd., Mumbai, India) and custom tray was fabricated for maxillary arch with auto-polymerizing acrylic resin (DPI-cold cure, Dental Products of India Ltd., Mumbai, India). A final impression was made with light-body addition silicone impression material (Aquasil, Dentsply, Germany) in the modeling compound border-molded custom tray and poured in type III dental stone (kalstone, Kalabhai Karskarson Pvt. Ltd., Mumbai, India.) to obtain master cast. After block-out of the master cast, the casts were mounted on a semi-adjustable articulator (Hanau Wide-View, Waterpik, and Fort Collins, USA) using face-bow transfer and jaw relation record. Teeth were arranged in the intra oral prosthesis on the defective side using fixed guidelines to aid in the function comfort and esthetics in the patient. Primarily, a hollow bulb obturator partial denture prosthesis was fabricated with Challan and Barnett technique, [10] using heat cure acrylic resin (DPI-Heat cure, Dental Products of India Ltd., Mumbai, India) [figure 2]. Necessary corrections were made after the prosthesis was worn for a few days.



Figure 3

Figure 4

Figure 5



Figure 6

Figure 7

Interim obturator was then placed in patients mouth prior to impression making of the facial defect area. Facial mouldage was made using irreversible hydrocolloid (Tropicalgin Chromatic, Zhermack, BadiaPolsine, Italy), [figure 3] material was reinforced with gauze and dental plaster. Impression was boxed and poured in Type III dental stone (Kalstone, Kalabhai Karskarson Pvt. Ltd., Mumbai, India) for sculpting [figure 4]. An auto-polymerizing acrylic resin (DPI-cold cure, Dental Products of India Ltd., Mumbai, India) core was fabricated on the cast for attaching the ocular part of the orbital prosthesis. An acrylic shell was fabricated simulating sclera of the patient and an iris button of appropriate size was chosen and painted. During iris orientation, patient was asked to gaze straight ahead. The distance from the pupil of the normal eye to the midline was used in establishing the horizontal position of the prosthetic pupil's centre. Its vertical

position was determined by the can thus relationships. [11] Marked coordinates of the pupil were used to circumscribe the diameter of the iris. Subsequently the eye shell was packed with transparent acrylic to give a natural appearance. Wax pattern for the orbital prosthesis was carved out on the master cast. The carving was done in manner to retain the same characteristic of contralateral side of the face. A 3-mm thick and 2.5 cm in diameter, disc-shaped attractive Co5-Sm magnet (Innovadent, Dental ventures of America, Corona, USA) with magnetizable metal ferromagnetic keeper. was attached with wax to the superior most portion of the bulb and the area of the silicone orbital prosthesis that is in close contact with the intra oral prosthesis Indelible pencil was drawn on the surface of the first magnet, and the facial prosthesis was positioned in its location to demarcate the area of most contact. A trial fit was then performed to asses all the functional and

esthetic requirements of the facial prosthesis [figure 5]. Proper orientation of magnetic attachments was verified and sealed with

auto polymerising acrylic resin (DPI-cold cure, Dental Products of India Ltd., Mumbai, India) [figure 6]



Preoperative extraoral view



Post operative extraoral view

The entire wax pattern with the ocular prosthesis was lifted from the facial cast and invested and mould formed. Then, the acrylic substructure was placed on the mold after dew axing and was packed with a MDX4-4210-basesilicone (Dow Corning Corp., Midland, USA). Laminar intrinsic staining was used in packing according to the patient's skin color. [11] The silicone was heated for 2 hours at 90°C, disinvested, trimmed, and cleaned. The prosthesis was trial fitted and extrinsically colored by medical adhesive type A (Dow corning, Midland, MI) and oil pigments (Factor II, Lakeside, USA). The prosthesis was then finished and polished [figure 7].

The patient was instructed regarding the method of placement and removal of the sections as well as the techniques for cleansing of the prostheses and anatomic

defects at home. Patient was recalled on frequent appointments to eliminate pressure areas and adjustments and to ascertain proper tissue healing and patient comfort.

DISCUSSION

Mid facial defects can result in serious functional impairment of speech, mastication, and swallowing. The cosmetic deformity often has a significant psychological impact. Rehabilitation can be accomplished surgically or prosthetically or by combination of both. Selection of each method depends on many factors including size, location of the defect, and age of patient. [11] Facial prosthesis usually provides acceptable esthetic results but the retention can be challenging. Various methods of auxiliary retention for facial prosthesis have been described in the

literature; they include eyeglasses, [12] denture extensions that eng a get issue undercuts, [12,13] magnets, [12,14] facial prosthetic adhesives, [12] or combination of the above, [12,13,15] and craniofacial implants. [12,13,16,17] Respiratory epithelium is easily traumatized by frictional contact with prosthesis and limits the use of anatomic undercuts. [18] Soft tissues around defects may not always be ideal for adhesive retention because movements that occur during smiling compromise adaptation of prosthesis margins. [19,20] For the first time, Nadeau [21] described the use of combination of extra- and intraoral prostheses connected by magnets. Durability of surface coatings of the long-term magnets is a major concern; hence, it is advised to use the magnets with strong surface coatings. Connecting these prostheses often results in movement of facial prosthesis during mastication. [22,23] Although craniofacial implants may provide the most reliable prosthesis retention, additional surgeries, expenses, inadequate quantity or quality of the bone, and prior radiation to the area may contraindicate this type of treatment. [24,25] A hollow acrylic resin framework used for facial prosthesis is advantageous as there is no need to fabricate the whole prosthesis again in case of discoloration or damage of the silicone layer because the outer silicon layer can be removed and repacked with the new silicon on the acrylic resin frame work if the mold is preserved. The advantages of this prosthesis are that the technique is non invasive, cost effective, tissue tolerant, esthetic, comfortable to use, and easy to clean. The difficulty in maxillofacial rehabilitation of large defects often involves the compromise of functional adequacy versus esthetic.

CONCLUSION

The prosthesis, although static, helped restore the patient's appearance and confidence. Reconstruction of a large mid facial defect involving the orbit is a surgical challenge. Patients in such situation can be treated by giving an extra oral silicone

orbital prosthesis and intra oral obturator prosthesis and retained using magnets.

REFERENCES

1. J. B. Ludlow, L. E. Davies-Ludlow, S. L. Brooks, and W. B. Howerton, "Dosimetry of 3 CBCT devices for oral and maxillofacial radiology: CB Mercuray, New Tom 3G and i-CAT," *Dentomaxillofacial Radiology*, vol.35, no. 4, pp.219–226, 2006
2. "The glossary of prosthodontic terms," *J Prosthet Dent*, 2005. vol.94, no.1, pp.10-92,
3. C. A. Lascala, J. Panella, and M. M. Marques, "Analysis of the accuracy of linear measurements obtained by cone beam computed tomography (CBCT-New Tom)," *Dent maxillofacial Radiology*, 2004; vol.33, no.5:291-294.
4. D. M. Hecker, J. P. Wiens, T. R. Cowper et al., "Can we assess quality of life in patients with head and neck cancer? A preliminary report from the American Academy of Maxillofacial Prosthetics," *Journal of Prosthetic Dentistry*, 2002; vol. 88, no.3: 344-351,
5. M. T. Marunick, R. Harrison, and J. Beumer, "Prosthodontic rehabilitation of mid facial defects," *The Journal of Prosthetic Dentistry*. 1985; vol.54, no.4: 553-560.
6. Marunick MT, Harrison R, Beumer J III. Prosthodontic rehabilitation of midfacial defects. *J Prosthet Dent* 1985; 54:553-60.
7. S.Jain, K.Maru, J.Shukla, A.Vyas, R.Pillai, and P.Jain, "Nasal prosthesis rehabilitation: a case report," *The Journal of Indian Prosthodontic Society*, 2011; vol.11, no.4:265-269.
8. R.Brignoni and J.T.Dominici, "An intraoral-extra oral combination prosthesis using an intermediate framework and magnets: a clinical report," *J Prosthet Dent*. 2001; vol. 85, no.1:7-11.
9. Wang RR. Sectional prosthesis for total maxillectomy patients: A clinical report. *J Prosthet Dent* 1997; 78:241-244.
10. V. A. Chalian and M. O. Barnett, "A new technique for constructing a one-piece hollow obturator after partial maxillectomy," *The Journal of*

- Prosthetic Dentistry, 1972. vol. 28, no. 4, pp. 448-453, View at Publisher. View at Google Scholar. View at Scopus
11. T. D. Taylor, Clinical Maxillofacial Prosthetics, Quintessence, CarolStream, Ill, USA, 2000.
 12. K. F. Thomas, J. Penchas, and M. Sela, "Prosthetic rehabilitation," Implant Dentistry, 1994. vol.3,no.3,p.198,
 13. J. B. Ludlow and M. Ivanovic, "Comparative dosimetry of dental CBCT devicesand 64-sliceCT for oral and maxillofacial Case Reports in Dentistry 5 radiology," Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology, 2008. vol.106,no.1,pp.106-114,
 14. H.B. Dumbrigue and A. Fylerb, "Minimizing prosthesis movement in a mid facial defect: a clinical report," Journal of Prosthetic Dentistry, 1997. vol.78,no.4,pp.341-345,
 15. Y. Yang, E. Schreibmann, T. Li, C. Wang, and L. Xing, "Evaluation of on-board kV cone beam CT (CBCT)-based dose calculation," Physics in Medicine and Biology,2007 vol.52,no.3,pp. 685–705,.
 16. H.Menneking, M.Klein, B.Hell, andJ. Bier, "Prosthetic restoration of nasal defects: indications for two different osseointegrated implant systems," Journal of Facial and Somato Prosthetics, 1998. vol.4,no.1,pp.29–33,
 17. J.Tulasne, P.Worthington, and P. Bran mark, Advanced Osseointegration Surgery, Applications in the Maxillofacial Region. Advanced Osseointegration Surgery, Applications in the Maxillofacial Region, 1992.
 18. Udagama and G. E. King, "Mechanically retained facial prostheses: helpful or harmful?" The Journal of Prosthetic Dentistry, 1983.vol.49,no.1,pp.85-86,
 19. A. Shifman, "Selective-pressure impression technique for nasal prostheses," The Journal of Prosthetic Dentistry, 1987.vol.58, no.3, pp. 349-351.
 20. A.L. Martone, "Anatomy of facial expression and its prosthodontic significance," The Journal of Prosthetic Dentistry, 1962.vol.12, no.6, pp.1020-1042.
 21. J. Nadeau, "Maxillofacial prosthesis with magnetic stabilizers," The Journal of Prosthetic Dentistry, 1956.vol. 6, no.1, pp.114-119,
 22. J. Nadeau, "Special prostheses," The Journal of Prosthetic Dentistry, 1968. vol.20, no.1, pp.62-76.
 23. S. Birnbach and G. L. Herman, "Coordinated intraoral and extra oralpro stheses in there habilitation of the or facial cancer patient," The Journal of Prosthetic Dentistry, 1987. vol. 58, no. 3, pp. 343-348.
 24. M. R. Arcuri, W. E. LaVelle, E. Fyler, and R. Jons, "Prosthetic complications of extra oral implants," The Journal of Prosthetic Dentistry, 1993; vol.69, no.3: 289292.
 25. E. Roumanas, R. Nishimura, J. Beumer, P. Moy, J. Weinlander, and J. Lorant, "Craniofacial defects and osseointegrated implants: six-year follow-up report on the success rates of craniofacial implants at UCLA," International Journal of Oral and Maxillofacial Implants, 1994.vol.9, no.5,pp.579-585.

How to cite this article: Yaqoob A, Tagoo R, Malik UA et. al. Mid facial defect rehabilitation using extra oral and intraoral prosthesis retained by magnets. Int J Health Sci Res. 2017; 7(1):301-306.
