CASE REPORT

Prosthetic Rehabilitation of Continuous Maxillary and Orbital Defect

¹Yogesh Kumar, ²Vinayak Bharate, ³Dinesh Babu, ⁴Chandralekha Verma

ABSTRACT

Orbital exenteration along with hemimaxillectomy for malignant tumor of maxilla usually results in continuous orbital and maxillary defect. A removable maxillofacial prosthesis with adequate retention and stability during functional movement along with good esthetics is the key for successful rehabilitation of such patients. This case report describes a novel and yet cost-effective method for retention of silicone orbital prosthesis using acrylic resin base attached to maxillary obturator using pin and socket of an electric plug which results in better retention of both the prosthesis.

Keywords: Continuous defect, Obturator, Orbital prosthesis.

How to cite this article: Kumar Y, Bharate V, Babu D, Verma C. Prosthetic Rehabilitation of Continuous Maxillary and Orbital Defect. *Int J Prosthodont Restor Dent* 2017;7(2):77-80.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Surgical resection for orofacial malignancy is extremely debilitating in nature because of its deep psychological impact with severe disfigurement and functional impairment. It often results in communication between the oral and nasal cavity that causes difficulty in swallowing and speech, nasal regurgitation, and unesthetic facial appearance. Such defects are usually rehabilitated by a facial prosthesis to restore function and appearance along with an intraoral obturator to restore speech and swallowing.¹ Various methods used for retention of such prosthesis include spectacle frame,² anatomic retention

using acrylic conformer relined by a soft liner,³ adhesives,⁴ stud attachments, magnets,⁵ and osseointegrated implant.⁶ With use of spectacle retained prosthesis, it becomes mandatory for the patient to wear spectacles during use of prosthesis. Limitations of adhesives include possible allergic reactions, decreased efficacy with use, and need for daily application and removal. Although osseointegrated implants may provide the most reliable prosthesis retention, additional surgeries, expenses, inadequate bone, and prior radiation to the area may contraindicate their use. Other means are use of magnets or buttons to attach orbital prosthesis with obturator.⁷ Limitations of magnets include high cost, corrosion, and loss of magnetism with time. This case report describes an innovative technique for retention of silicone orbital prosthesis to maxillary obturator with use of pin and socket of an electric plug.

CASE REPORT

A 55-year-old female patient reported to the Department of Prosthodontics, CDER, AIIMS, New Delhi, with a chief complaint of missing right eye and regurgitation of food since last 3 months (Fig. 1). Patient had undergone orbital exenteration and hemimaxillectomy of the right side because of squamous cell carcinoma eroding the right orbital floor, posterior wall of maxilla, infratemporal fossa, right hard palate, medial wall of maxilla, right nasal cavity, and right ethmoidal air sinuses. This led to the formation of right orbital defect which was continuous with intraoral maxillary defect. For prosthetic rehabilitation of this patient, silicone orbital prosthesis attached to a hollow closed bulb obturator with the help of electric pin and socket was planned.

Impression Procedure for Obturator and Orbital Defect

Primary impression of intraoral maxillary defect was made with alginate and poured with dental stone (type III). Maxillary cast was then surveyed and undesirable undercuts were blocked. Custom tray was thus fabricated, border molding of the defect was done and final impression was made with light body addition silicone. On final working, model of obturator record base was fabricated, jaw relation was made followed by try in patient to check

^{1,3}Senior Resident, ²Assistant Professor, ⁴Postgraduate Student

¹Department of Dentistry, All India Institute of Medical Sciences Raipur, Chhattisgarh, India

²Department of Prosthodontics, Dr. D. Y. Patil Dental College & Hospital, Pune, Maharashtra, India

³Department of Dental Surgery, PSG Hospital, Coimbatore, Tamil Nadu, India

⁴Department of Oral Pathology, Rungta College of Dental Sciences & Research, Bhilai, Chhattisgarh, India

Corresponding Author: Vinayak Bharate, Lecturer, Department of Prosthodontics, Dr. D. Y. Patil Dental College & Hospital Pune, Maharashtra, India, Phone: +918826810845, e-mail: vinayakbharate@gmail.com.

Figs 1A and B: Orbital defect and intraoral maxillary defect

Figs 2A and B: Intraoral maxillary obturator

esthetics and function. After try-in was completed, the orbital impression was made with trial denture in place covering the intraoral defect. Patient was draped for impression and extraoral marking was made on the face with indelible pencil so that it can replicate exact position of anatomical landmarks over the cast. Custom tray was fabricated with the help of impression compound with additional relief holes. Alginate was used as a primary impression material. Final impression of orbital defect was made with light body addition silicone with custom acrylic tray.

Attachment of Pin and Socket to Acrylic Conformer and Obturator

An acrylic conformer of orbital defect was fabricated and trial was made. To provide a mechanical undercut for the retention of orbital prosthesis, a 4 mm thick sprue wax was attached to the base of acrylic conformer. An obturator plate made of cold cure acrylic resin was also adjusted in patient's mouth. On the base of acrylic conformer, a

pin of electric plug was attached and a corresponding socket was attached to the top of bulb of the maxillary obturator and fit of both the parts were checked for easy insertion and removal of prosthesis. Flasking, dewaxing, and packing with heat cure acrylic resin was carried out for both acrylic conformer and obturator. Processed heat cure bases were tried on the patient for accurate adaptation, retention, and stability during functional movements (Fig. 2).

Fabrication of Orbital Prosthesis

To replicate pupil-iris size, color, contour, and sclera shape of contralateral eye accurately, a customized ocular prosthesis was fabricated. Its final orientation was first refined on the working model with the help of recorded facial measurement and then tried on patients face. Missing structures like eyelids and associated anatomical structures were sculpted in modelling wax. Final completed wax pattern was tried on the patient face for evaluation of ocular orientation gaze, eyelid

Figs 3A and B: Trial of obturator and orbital prosthesis

Figs 4A and B: Final silicone eye prosthesis and intraoral obturator

aperture, size, and volume of sclera visible and prosthesis margin fit as compared to the contralateral eye (Fig. 3). Patient's opinion was also taken regarding the esthetics acceptability of prosthesis. This was followed by flasking, dewaxing, and packing in room temperature vulcanizing (RTV) silicone. Retrieved orbital prosthesis was characterized and was delivered to the patient with intraoral obturator in place (Fig. 4).

DISCUSSION

Surgical resection of the maxilla usually results in communication between the oral and nasal cavity that causes difficulty in swallowing, nasal regurgitation, unintelligible speech, and unesthetic appearance. Surgical reconstruction in such patient may add major financial burden and also has certain limitations, such as donor site morbidity, risk of recurrence, and compromise in esthetics. Therefore, prosthetic rehabilitation is usually preferred for such defects as it is quite inexpensive, allows for periodic examination and cleaning, and is also an alternative to surgery in medically compromised patients.

For rehabilitation of such patient, selection of biologically and functionally acceptable material for fabrication of prosthesis with economically feasible retentive aid should be used. For fabrication of orbital prosthesis, Factor II RTV silicone was used as it has better marginal adaptation, adequate edge strength, more lifelike appearance and better color stability as compared to other available material for maxillofacial prosthesis fabrication.⁸ In present case, to retain the obturator and orbital prosthesis together economic and household electric pin and socket was used.

With the use of osseointegrated implant and magnets, a much better final outcome with improved retention and stability would have been achieved but this was not possible because of financial constraints. Advantages of this technique are adequate retention, economical, tissue tolerance, noninvasive, and comfort for use and wear.

CONCLUSION

Orbital exenteration along with hemimaxillectomy with an ablative surgery as a treatment procedure for malignant

tumor of maxilla resulting in continuous maxillary and orbital defect severely affects the vital functions, such as mastication, speech, swallowing, deglutition, and facial esthetics. For rehabilitation of such defects, removable maxillofacial prosthesis with adequate retention and stability during function along with good esthetics is necessary. A simple and economic attachment which provides adequate retention for both orbital and obturator prosthesis made up of a pin and socket of an electric plug, was used in this case.

REFERENCES

1. Brignoni R, Dominici JT. An intraoral-extraoral combination prosthesis using an intermediate framework and magnets: a clinical report. *J Prosthet Dent* 2001 Jan;85(1):7-11.
2. McClelland RC. Facial prosthesis following radical maxillofacial surgery. *J Prosthet Dent* 1977 Sep;38(3):327-330.
3. Fattore L, Edmonds DC. A technique for the obturation of anterior maxillary defects with accompanying midfacial tissue loss. *J Prosthet Dent* 1987 Aug;58(2):203-205.
4. Wolfaardt JF, Tam V, Faulkner MG, Prasad N. Mechanical behavior of three maxillofacial prosthetic adhesive systems: a pilot project. *J Prosthet Dent* 1992 Dec;68(6):943-949.
5. Boucher LJ, Heupel EM. Prosthetic restoration of a maxilla and associated structures. *J Prosthet Dent* 1966 Jan-Feb;16(1):154-168.
6. Nishimura RD, Roumanas E, Moy PK, Sugai T. Nasal defects and osseointegrated implants: UCLA Experience. *J Prosthet Dent* 1996 Dec;76(6):597-602.
7. Lemon JC, Chambers MS. Locking retentive attachment for an implant-retained auricular prosthesis. *J Prosthet Dent* 2002 Mar;87(3):336-338.
8. Rodrigues S, Shenoy VK, Shenoy K. Prosthetic rehabilitation of a patient after partial rhinectomy: a clinical report. *J Prosthet Dent* 2005 Feb;93(2):125-128.