

Case Report

Cast Partial framework Obturator- A Promising rehabilitation for oral cancer patients: Case Report

Dr. Anandmayee Chaturvedi¹, Dr. Rupal J. Shah²

¹Consultant Prosthodontist, ²H.O.D. & Professor

Department of prosthodontics, Government dental college & hospital, Ahmedabad

*Corresponding author

Dr. Anandmayee Chaturvedi

Email: dranandmayee@gmail.com

Abstract: Malignancies are common in the oral region. In Indian male, oral cancer is the most prevalent cancer; these cancers are treated through surgical intervention. Surgery creates communication between the oral cavity, nasal cavity, and maxillary sinus. Post-surgical maxillary defects pre-dispose the patient to impaired masticatory function, hyper nasal speech and fluid leakage into the oral cavity. A prosthesis used to close such palatal defect in a dentate or edentulous mouth is referred to as an obturator. Because of the cantilever suspension of the obturator section, a good mechanical retention device should be used. There are many technical methods and mechanical devices for obtaining maximum retention and stability. The purpose of this article is to describe the procedure for making a partial denture obturator with cast framework to improve retention, stability and support of the obturator.

Keywords: Obturators, Hemi maxillectomy cast partial denture with obturator, Oro-antral communication

INTRODUCTION:

The goal of prosthodontics is rehabilitation of missing oral and extra oral structures along with restoration of the normal functions of mastication, speech, swallowing, appearance and so on. (remove coma after appearance). Malignancies are common in the oral region. In Indian male, oral cancer is the most prevalent cancer; these cancers are treated through surgical intervention. Surgery creates communication between the oral cavity, nasal cavity, and maxillary sinus and reduces the residual teeth and tissue's ability to provide optimal cross-arch support, stability, and retention. Post-surgical maxillary defects pre-dispose the patient to impaired masticatory function, hyper nasal speech and fluid leakage into the oral cavity [1]. Maxillofacial defects can also affect a patient's physical, psychological, and social status. Probably the most common of all intraoral defects are in the maxilla, in the form of an opening into the antrum and nasopharynx. In such cases, it is very difficult for the patient to perform various normal functions like mastication, swallowing, speaking. A prosthesis used to close such palatal defect in a dentate or edentulous mouth is referred to as an obturator [1]. Lack of support, retention, and stability are common prosthodontic treatment problems for patients who have had a maxillectomy. Because of the cantilever suspension of the obturator section, a good mechanical retention device should be used [2]. In the total rehabilitation of

the maxillectomy patient, the maxillofacial prosthodontist has two primary objectives:

1. To restore the functions of mastication, deglutition, and speech and
2. To achieve normal oro-facial appearance [3].

Ambroise Pare was the first to use artificial means to close a palatal defect as early as the 1500s. The early obturators were used to close congenital rather than acquired defects. Claude Martin described the use of surgical obturator prosthesis in 1875. Fry described the use of impressions before surgery in 1927, and Steadman described the use of an acrylic resin prostheses lined with gutta-percha to hold a skin graft within a maxillectomy defect in 1956 [4,5]. An obturator may be used to act as a framework over which tissues may be shaped by the surgeon; to serve as a temporary prosthesis during the period of surgical correction and to restore a patient's cosmetic appearance rapidly for social contacts. An obturator can also be used at such places where surgery is contraindicated.

The obturator can improve deglutition and mastication, when they are impaired due to defect. It may be used to keep the wound or defective area clean, and may enhance the healing of traumatic or post-surgical defect. It can also help to reshape and reconstruct the palatal contour and/or soft palate. It improves speech or in some instances makes speech

possible (especially in patients with defect in maxilla). It can be used to correct facial contour, to benefit morale of patient's undergone surgery. It reduces the flow of exudates into the mouth. The obturator may be used as a stent to hold dressings or packs post-surgically in maxillary resections. It reduces the possibility of post-operative hemorrhage, and maintains pressure either directly or indirectly on split-thickness skin grafts, thus causing close adaptation of the graft to the wound which prevents the formation of a hematoma and ultimate failure of the graft [1].

CASE REPORT:

A patient aged 35 years reported to the department of prosthodontics six months after surgery. The chief complaint was inability to chew food because of loss of some teeth and change in voice after surgery. The patient was operated for mucoepidermoid carcinoma after being diagnosed by biopsy. The site of surgery was the maxillary right buccal sulcus area and half of the hard palate on that side. All the teeth of that arch were also removed. Intraoral examination revealed complete healing of the operated site. The missing teeth were 21, 11, 12, 13, 14, 15, 16, 17, and 18. Considering patient's age, economical condition and healing of defect, a definitive obturator with cast partial framework was planned.



Fig 1: Intra-oral view of right side hemimaxillectomy defect



Fig 2: Pre-operative dentition & Occlusion (Frontal View)

1. The primary maxillary and mandibular impression were taken with irreversible hydrocolloid material alginate (Zelgan 2002; Dentsply-India, Gurgaon, India) and the cast was poured with dental stone (type III) (Kalstone; Kalabhai Karson, Mumbai, India)

2. Surveying of primary maxillary cast was done and undercut areas were blocked.
3. As patient was case of class-I hemimaxillectomy defect according to Aramany classification, and there were not enough anterior teeth to provide support, a linear cast partial denture design was planned.
4. Rest seat and guide plane preparations were done.
5. Border molding of defect area was done with green stick (Pinnacle, Dentsply) and final impression was recorded using light-body addition silicone material (Aquasil LV; Dentsply International, Milford, Delaware, USA)



Fig 3: Border molding of defect area



Fig 4: Final wash impression of defect area & prepared rest seat

5. Final impression was poured with die stone (type IV) (Kalstone; Kalabhai Karson, Mumbai, India) and the cast was duplicated in refractory material.
6. Partial framework of the cast was fabricated with the help of various wax patterns.

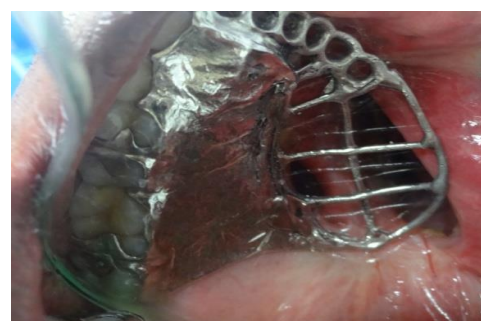


Fig 5: Framework try-in

7. Jaw relation was recorded with modeling wax (No. 2; MDM Corporation, New Delhi, India) and after teeth arrangement; a try-in was done.

8. The prosthesis was cured with heat-cured acrylic resin (Trevlon; Dentsply, Gurgaon, India) and properly finished and polished.

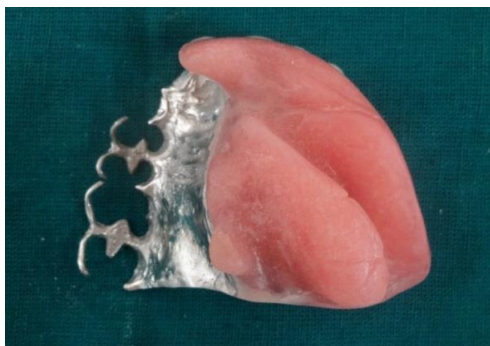


Fig 6: Final cast partial denture with obturator (Intaglio surface)

9. The prosthesis was finally inserted and the patient was educated regarding oral hygiene and future maintenance of the prosthesis.



Fig 7: Post-operative image with obturator in place



Fig 8: Occlusion with obturator in place

DISCUSSION:

A definitive obturator is not indicated until the surgical site is healed and the patient is prepared physically and emotionally for the restorative care that maybe necessary. Though, excessive delay should be avoided, because most of the time mouth opening reduces due to muscular fibrosis, which makes dental procedures difficult. Lack of retention, stability, and support are common problems of treatment for patients who have had a maxillectomy.

According to Parr *et al.*; in 1989 [6] the Aramany classification system of post-surgical maxillary defects is a useful tool for teaching and developing framework designs for obturator prostheses and for enhancing communication among prosthodontists [7]. The abutment teeth and periodontium should be restored and healthy before commencing the rehabilitation. The classification is divided into six different groups based on the relationship of the defect area to the remaining abutment teeth. The general principles of removable partial denture (RPD) design apply to obturator prosthesis design as well.

The basic principles of removable partial denture designing should be reviewed when designing a framework for an obturator. Major connectors should be rigid, occlusal rests should direct occlusal forces along the long axis of the teeth, guide planes should be designed to facilitate stability and bracing, retention should be within the physiological limits of the periodontal ligament and maximum support should be gained from the residual soft tissues [8]. Multiple occlusal rests are suggested to improve stability and support for the obturator prostheses and to minimize the movement of the prosthesis towards the tissue.

The linear design is used for the class I defect when there are no anterior teeth present or when one does not desire to use the anterior teeth. The remaining posterior teeth are usually in a relatively straight line. In the linear design, support is provided by the remaining posterior teeth and the palatal tissues. The palate becomes more important in the linear design because the use of leverage to resist vertical dislodging forces is decreased. Retention is usually provided by the combined use of buccal premolar retention and lingual molar retention. Lateral and distal wall of defect are should be recorded accurately in such cases, because these wall help in retaining the prostheses.

The most important aspect of stability is occlusion. The stress created by lateral forces is minimized by the correct selection of an occlusal scheme, elimination of premature occlusal contacts, and wide distribution of stabilizing components [2, 7]. Acrylic resin teeth with a reduced occlusal contact area are indicated.

CONCLUSION:

The management of the patient with maxillectomy requires a multidisciplinary approach. The retention and stability of the obturator for the patient who has had a hemi maxillectomy are major problems. Contemporary materials and techniques for obturator prosthesis can provide solution for various clinical conditions. Depending on the case, the operator should select the best suitable material and technique for successful rehabilitation and thereby improving

quality of life of the patient. Though it is difficult to improve the quality of life for hemi maxillectomy patients compared with patients with conventional prostheses, this can be achieved with skill, knowledge and experience of specialists.

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