

## Cast Metal Definitive Obturator – Rehabilitating A Maxillectomy Patient

### Authors:

**Dr. Tripty Rahangdale, Dr. Debashish Panigrahi, Dr. Saurabh Shrivastava, Dr. G. Balamurugan, Dr. Johnson Ngangbam Singh, Dr. Manisha Parpiyani.**

*Prof and Head, Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College, Bhopal*

*Private practitioner, Raurkela, Odissa*

*Reader, Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College, Bhopal*

*Final Yr Postgraduate, Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College, Bhopal*

*Final Yr Postgraduate, Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College, Bhopal*

*Second Yr Postgraduate, Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College, Bhopal*

Name and address of the department or institution to which the work should be attributed-

Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College, Bhopal

### Corresponding Author:

Dr. G. Balamurugan

Final year postgraduate, Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College, Bhopal

Article Received: 30-July-2023, Revised: 11-August-2023, Accepted: 01-September-2023

### **ABSTRACT:**

**Introduction:** Maxillectomy defects can result in oroantral communication that causes difficulty in mastication and deglutition, impaired speech and facial disfigurement. The prosthodontist plays an important role in rehabilitation of such defects with obturators. **Case Characteristics:** Name- Hemraj Prajapati, Age/Gender- 58yrs, Patient complains of nasal regurgitations and difficulty in speech and swallowing since past 2yrs due to maxillary defect. Patient gives history of ameloblastoma, which was surgically treated 2yrs back. **Outcome:** The patient was satisfied with the final prosthesis as it not only helped to improve his mastication and speech but also enhanced his appearance and gave him confidence to socialize. **Discussion:** This paper presents a clinical report of fabricating a definitive obturator with a cast metal framework using a single flask and one time processing method. **Conclusion:** This definitive process is rehabilitating the patient by providing better masticatory efficiency, improving the clarity of speech and enhancing the quality of life of patient.

**Keywords:** Maxillectomy, obturator, ameloblastoma, rehabilitating, Cast partial denture

### **INTRODUCTION:**

Malignancies are common in oral region. In India, particularly in males, oral cancer is the most prevalent cancer and are treated through surgical interventions. Surgery creates communication between the oral cavity, nasal cavity and maxillary sinus. It also reduces the residual teeth and tissue's ability to provide optimal cross arch support, stability and retention.<sup>1</sup>

Maxillectomy defects leads to difficulty in mastication and deglutition, along with impaired speech and facial disfigurement. These defects dispose the patient to hypernasal speech, leakage of fluid into nasal cavity and impaired masticatory function. Such prosthesis needs special prosthesis to establish the oronasal seal, which can be provided by an Obturator.<sup>2</sup>

The Glossary of Prosthodontic Terms defines an obturator as "A maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar or soft tissue structures".<sup>3</sup> The main goal of prosthetic rehabilitation for total and partial maxillectomy patients include separation of oral and nasal cavities to allow adequate deglutition and articulation, and also possible support to orbital contents to prevent enophthalmos and diplopia, soft tissue's support to restore midfacial contour and acceptable aesthetic result. It also aims to restore speech, mastication, transport of bolus, avoidance of aspiration and nasal regurgitation. The extension of the obturator varies according to the configuration of defect, character of its lining tissue, and functional requirements for stabilization, support and retention of prosthesis along

with number of remaining teeth, amount of bone support and ability of the patient to adapt to the prosthesis.<sup>4</sup>

The following case report present one such scenario, followed by fabrication of obturator prosthesis.

### **CASE REPORT:**

A 45 years old male patient had reported to the Department of Prosthodontics and Crown & Bridge, Mansarovar Dental College and Hospital, Bhopal, India with a chief complaint of missing teeth, difficulty in chewing, drinking, speech and deformity of left side of face due to surgical removal of tumor. His medical history was not contributory. The patient treatment report revealed that he was suffering from ameloblastoma of maxillary ridge extending from right central incisor to second molar regions, which was operated in private hospital. On intra oral examination patient has Armany's class I maxillectomy defect on left side of face associated with lack of lip support and depressed nasolabial fold. The patient was initially rehabilitated with interim obturator for 6 months and currently replaced with definitive cast partial obturator along with replacing 21 to 27 teeth.

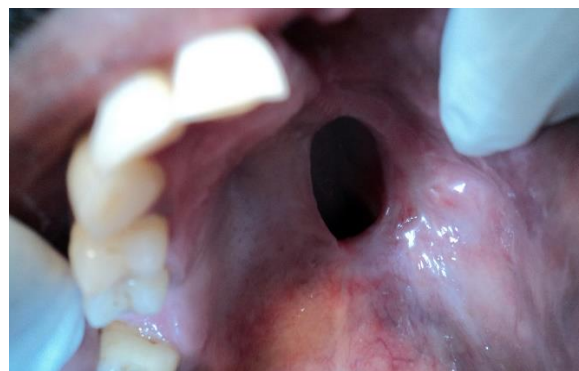
### **PROCEDURE:**

Maxillary and mandibular primary impressions were made using alginate (septodont mariflex T<sup>M</sup>) and casts were poured using type II dental plaster (gem stone T<sup>M</sup>). These casts were surveyed and cast partial framework design was planned Embrasure clasps were planned in

relation to 14, 15 and 17,18 along with I-bar on 11. A complete palatal type of major connector was planned. The spacer was then fabricated using modelling wax (Pyrax) over this custom tray was fabricated using selfcure acrylic resin (DPI RR). Final impression was the made using light body elastomeric impression material (GC Flexceed light body). The final cast was poured with die stone (Gem stone T<sup>M</sup>). Blockouts were made before duplicating the refractory cast using investment material (S.P.E. Phosphate bonded investment material). On this refractory cast desired wax pattern was fabricated using pattern wax (YETI dental pattern wax) and casting was carried out using Co-Cr dental alloys. Trial of this framework was done and needed adjustments were made. Later occlusal rims were fabricated on framework and jaw relation was recorded. It was than mounted onto an articulator and teeth arrangement was done using acrylic teeth (Acryrock), this arrangement was than checked in the patient for satisfactory esthetics and phonetics. Then, the prosthesis was processed using heat cure acrylic resin (DPI RR), finished using burs (Zenplus acrylic trimmer kit), and polished using EiTi acrylic polisher points in the usual manner. During the time of insertion, the pressure indicator (Master-dent pressure indicator paste 2.25OZ) was used to inspect for any pressure areas. The denture was inserted and post-insertion instructions were given to the patient for the care and use of the obturator. The patient was re-viewed bimonthly for three months, after that the patient was recalled every 3 months.



**FIG 1: Preoperative view**



**FIG 2: Intraoral view**



FIG 3: Primary Impression



FIG 4: Primary cast

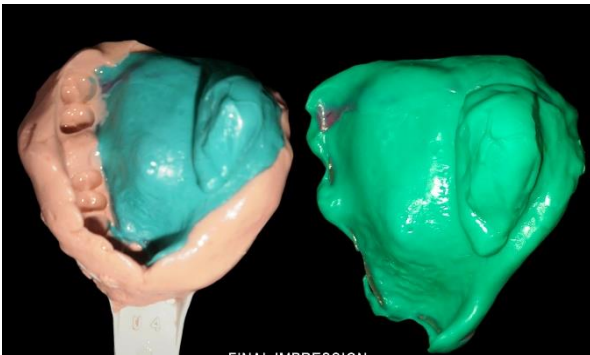


FIG 5: Final Impression

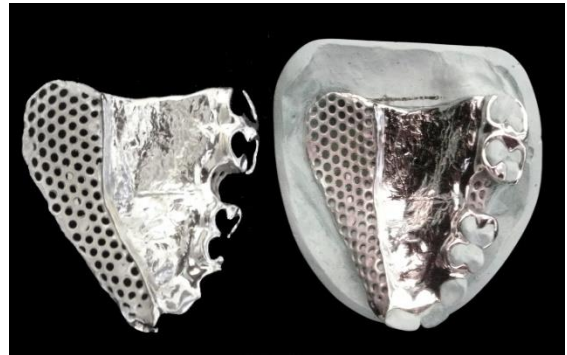


FIG 6: Refractory cast with metal framework



FIG 7: Jaw Relation



FIG 8: Wax try-in

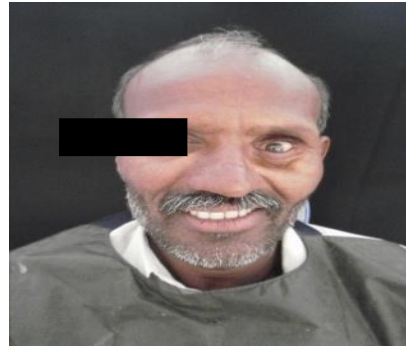


FIG 9: Post operative view

## **DISCUSSION:**

Maxillofacial prosthesis is the art & science dealing with the anatomical, functional & cosmetic reconstruction using inert substitute. Prosthetic rehabilitation of an acquired large palatal defect is very challenging.<sup>5</sup> However, rehabilitation of maxillary defect is relatively simpler than rehabilitating mandibular defects, but greater efforts are needed to deal with large defects especially to obtain retention & support.<sup>6</sup>

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 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.<sup>7</sup> With newer materials and technologies coming into play, the modern-day obturator has begun gaining popularity. 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 may also be used as a stent to hold dressings or packs postsurgically in maxillary resections cases. 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 graft failure. Obturator prosthesis is necessary to restore the contours of the palate and to recreate the functional separation between the oral cavity, sinus and nasal cavity. Therefore, proper understanding and knowledge of the obturator is a necessity to make the treatment efficient.

A successful prosthetic design is such that it utilizes the remaining portion of palate and dentition to maximize the support, stability, and retention of an obturator. In

dentate patients, remaining teeth, soft tissue undercuts and scar band, play an essential role in primary retention, support, and stability of a prosthesis.<sup>8</sup>

The technique described in the article for the fabrication of obturator is convenient and easy. Besides this, rather than recording depth of the defect and subsequent increasing height of prosthesis, broad coverage and water-tight seal were given more importance, which eliminates the need for hollow prosthesis, which most often leads to decreased strength of the obturator.

Preservation of remaining structure has been of prime importance in any prosthetic rehabilitation. This is easy to achieve with the cast metal definitive obturator. As the metal framework not only stabilizes the prosthesis, but also reduces the soreness and discomfort of soft tissue in the superior- lateral aspect of the defect. This helps to obtain accurate jaw relation record and try-in in terms of esthetic and phonetics. In comparison to the conventional acrylic obturator, it also provides better support and retention and also the abutment teeth and soft tissue undercuts were subjected to less stress. Furthermore, midline fatigue fracture is not very common issue with cast obturators.<sup>9</sup> Care must be taken to effectively restore the abutment teeth and periodontium to health before commencing the rehabilitation.

Occlusion is the most important aspect of stability. The lateral stresses can be minimized by the correct selection of an occlusal scheme, elimination of premature occlusal contacts, and wide distribution of stabilizing components. Acrylic resin teeth with a reduced occlusal contact area are indicated. Stabilization and indirect retention components must be positioned effectively to retard the movement of the defect extension portion away from its terminal position.<sup>10</sup>

Different types of retentive aids such as magnets, snap-on (friction-type) attachments, acrylic buttons, retentive clips, and implants can also be used for the conventional obturator prosthesis. However, cost, health of the patient, and bone qualities are some of the factors

which play a crucial role in determine the treatment plan for such patients.

**Sources of support:** Nil

#### **REFERENCES:**

1. Anandmayee Chaturvedi et al., Sch. J. Dent. Sci., Vol-4, Iss-5 (May, 2017), pp-246-249.
2. Rieger, J. Wolfaardt, H. Seikaly, N. Jha, "Speech outcomes in patients rehabilitated with maxillary obturator prostheses after maxillectomy: a prospective study," International Journal of Prosthodontics, vol. 15, no. 2, pp. 139–144, 2002.
3. K. J. Ferro, S. M. Morgano, C. F. Driscoll et al., "The glossary of prosthodontic terms," Journal of Prosthetic Dentistry, vol. 94, no. 1, pp. 10–92, 2005.
4. Cardelli P, Bigelli E, Vertucci V, Balestra F, Montani M, De Carli S, Arcuri C. Palatal obturators in patients after maxillectomy. ORAL & implantology. 2014 Jul;7(3):86.
5. Sawhney A, Dwivedi H, Singh S, Dhar S, Gupta S, Choudhary P. Hollow bulb obturator- a simplified approach. Arch of Dent and Med Res. 2016; 2(1):59-63.
6. Alhadj MN, Ismail IA, Khalifa N. Maxillary obturator prosthesis for a hemimaxillectomy patient: A clinical case report. The Saudi Journal for Dental Research. 2016; 7(2):153-9.
7. Huryn JM, Piro JD. The maxillary immediate surgical obturator prosthesis. The Journal of prosthetic dentistry. 1989 Mar 1; 61(3):343-7.
8. Reham ME, Lobna ME, Ahmed MA, Mohamed MA. The speech outcome of definitive obturators constructed using two different impression techniques. The Egyptian Journal of Otolaryngology. 2016; 32(1):61.
9. Garhnayak M, Kumar V, Garhnayak L. Cast Metal Definitive Obturator Prosthesis for Hemimaxillectomy Patient: A Case Report. Indian Journal of Forensic Medicine & Toxicology, October December 2020, Vol. 14, No. 4.
10. Aramany MA. Basic principles of obturator design for partially edentulous patients. Part I: Classification. The Journal of prosthetic dentistry. 2001 Dec 31; 86(6):559-61.

#### **How to Cite:**

Dr. Tripty Rahangdale, Dr. Debashish Panigrahi, Dr. Saurabh Shrivastava, Dr. Balamurugan Gurunathan, Dr. Johnson Ngangbam, & Dr. Manisha Parpiyani. (2023). CAST METAL DEFINITIVE OBTURATOR-REHABILITATING A MAXILLECTOMY PATIENT. *International Journal of Medical Science in Clinical Research and Review*, 6(05), Page: 818–822. Retrieved from <https://ijmscrr.in/index.php/ijmscrr/article/view/600> <http://doi.org/10.5281/zenodo.8310509>

© Dr. Tripty Rahangdale, Dr. Debashish Panigrahi, Dr. Saurabh Shrivastava, Dr. Balamurugan Gurunathan, Dr. Johnson Ngangbam, & Dr. Manisha Parpiyani. (2023) Originally Published in the Journal of "International Journal of Medical Science in Clinical Research and Review" (<https://ijmscrr.in>), 02.September.2023. This is an open-access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>)