

## Rehabilitation of Maxillary Defect Using an Obturator with Cast Partial Denture Framework- An Alternative Approach

Dr. Rajesh Shetty<sup>1</sup>, Dr. K kamalakanth Shenoy<sup>2</sup>, Dr. Sanath Shetty<sup>1</sup>, Dr. Savita dandekeri<sup>1</sup>, Dr. Mallikarjuna Ragher<sup>3</sup>, Dr. liya Zacharias vithayathil<sup>4\*</sup>, Dr. Tehseen zakir<sup>4</sup>

<sup>1</sup>Professor, Department of prosthodontics, Yenepoya dental college, Mangalore, Karnataka, India

<sup>2</sup>Professor and HOD, Department of prosthodontics, Yenepoya dental college, Mangalore, Karnataka, India

<sup>3</sup>Assistant Professor, Department of prosthodontics, Yenepoya dental college, Mangalore, Karnataka, India

<sup>4</sup>PG student, Department of prosthodontics, Yenepoya dental college, Mangalore, Karnataka, India

### Case Report

#### \*Corresponding author

Dr. liya Zacharias  
vithayathil

#### Article History

Received: 03.04.2018

Accepted: 18.04.2018

Published: 30.04.2018

#### DOI:

10.21276/sjds.2018.5.4.10



**Abstract:** A maxillofacial patient's quality of life is distorted and social integration becomes difficult. An obturator is a maxillofacial prosthesis used to close a congenital or acquired tissue defect, primarily of the hard palate and/or contiguous alveolar/soft-tissue structures. Subsequently, it restores the esthetics, speech, and function. The present clinical report aimed for the prosthetic rehabilitation of a maxillectomy defect by the incorporation of cast partial denture along with obturator. The retentive elements of the tooth and the undercuts of the defect gave dual retention. A patient is quite satisfied with bulb less, lightweight cast partial and hollow shim palatal obturator. This technique is beneficial because it helps patients maintain good esthetics and their ability to speak, swallow, and chew just after surgery.

**Keywords:** maxillofacial, lightweight, palatal obturator.

### INTRODUCTION

Acquired and/or congenital maxillectomy defects cause communication between the maxillary antrum and the oral cavity and oropharynx or nasopharynx, which results in impaired facial esthetics, compromised mastication, swallowing, and speech, and significant reduction in the quality of life [1]. Surgical reconstruction of maxillectomy defects is not always possible because of the general health of the patient [2]. The primary goal of a prosthetic obturator is closure of the maxillectomy defect and separation of oral cavity from sinonasal cavities [3].

Removable partial dentures are defined as dental prostheses that artificially replace teeth and associated structures in a partially edentulous jaw and can be removed from the mouth and replaced at will.'

A obturator has been defined as prosthetic rehabilitation of a dentulous maxillectomy patient with utilization of the remaining palate, the defect, remaining dentition and soft tissues to maximize retention, stability, and support [4]. The prosthesis should facilitate speech and deglutition by replacing those tissues lost because of the disease process and, as a result, reduce nasal regurgitation and hypernasal speech, improve articulation, deglutition, and mastication. An obturator prosthesis is classified as surgical, interim, or definitive and reflects the intervention period used in the maxillofacial rehabilitation of the patient. Prosthodontic restoration of a defect often includes use of a surgical obturator, interim obturator, and definitive obturator [5].

However, the prosthesis in this clinical case report is really two prostheses in one. The metal

framework and that portion of the denture base containing artificial teeth may be considered as one part, and the obturator portion, the part that actually closes the defect, can be considered as another. The framework design which retains the obturator involves considerations that may require its design to be treated differently. The partially edentulous maxillectomy patient will be used as an example of a patient requiring an obturator.

This clinical report describes the prosthodontic rehabilitation and fabrication of an obturator used for a partially edentulous patient with an acquired unilateral oro-antral communication defect.

### CASE REPORT

A 35 year old man reported to our out-patient department with the chief complaint of missing teeth

and difficulty in chewing and swallowing. He also complained of water coming out through his nose on intake of fluids. A thorough history was taken which included going through his old medical reports which revealed that the patient was diagnosed with Schwannoma of the left eye when he was 6 years old. The left eye was resected and a soft tissue graft was placed. In the following years, a soft tissue growth was observed by the patient. A biopsy revealed that it was a soft tissue sarcoma. The patient then underwent removal of the soft tissue tumor and also a hemi-maxillectomy was done. A forehead flap was raised and used to cover the defect.

The patient now complains of loss of teeth which has decreased his chewing efficiency & swallowing ability & altered speech. He also complains of fluids coming out through his nose following the hemi-maxillectomy.

Extra-oral examination revealed asymmetry of the face due to the forehead flap on the left side as well as a missing left eye. He had adequate mouth opening with normal lip length. TMJ examination revealed no deviation, clicking or any other abnormalities.

Intra-oral examination revealed partially edentulous maxillary arch with teeth number 21 to 28 missing. A keloid measuring 10\*10mm was observed on the left buccal mucosa due to the skin graft. There was an oro-antral communication noticed on the posterior maxilla on the left side due to the surgical resection during hemi-maxillectomy. Some part of the hard palate and adjacent mucosa was intact. The mandibular arch was completely edentulous. The final diagnosis was as follows:

- Chronic generalized gingivitis
- Dental caries limited to enamel irt tooth no.37
- Armanys class 1 defect Kennedy's Class III partially edentulous maxillary arch with oro-antral communication on the left side.

The treatment plan was discussed with the patient and he was given all the options of replacing the missing teeth and closing the oro-antral communication in the form of:

- Acrylic removable partial denture with obturator
- Flexible removable partial denture with obturator

- Cast partial denture with obturator
- Implant supported partial denture with obturator

After explaining all the advantages and disadvantages of all options, the patient decided to opt for a cast partial denture with obturator. The final treatment plan was as follows:

- Scaling & Polishing
- Composite restoration in relation to tooth no. 37
- Cast partial denture with obturator

1) A primary impression of the maxillary defect (Figure-1) was made with irreversible hydrocolloid impression material (tropicalgin, zhermack) This primary impression captured all the intraoral structures on the non-resected side and part of the resection defect, but with sufficient extension for the production of a cast framework for the maxillary obturator. Removal of the impression without discomforting the patient was possible. This impression was poured in dental stone (goldstone, Asian chemicals),

2) Surveying and designing of the components of the cast partial denture was done

3) A self-cured acrylic custom tray was fabricated for secondary impression. The impression of the resection defect was made with addition silicone medium body impression material (Aquisil ultra monophase; Dentsply Caulk) using monophase or single viscosity technique. In this technique, a single mix was made and a part of the material was placed in the tray and the other portion was injected onto the margins of the defect. The tray was then inserted intraorally and the impression was recorded

4) The impression was poured using type 3 dental stone (goldstone, Asian chemicals) and a master cast was obtained. Arbitrary and parallel blockout of the master cast was done. The master cast was then duplicated and wax pattern was made on the refractory cast obtained.

5) The wax pattern (Figure-2) was then invested and metal framework was obtained using the lost wax technique. The finished and polished metal framework was then tried in the patient's mouth.



**Fig-1: maxillary defect**



**Fig-2: Wax pattern design**

6) Jaw relation was recorded. After the arrangement of artificial teeth, occlusion, and esthetics were verified intraorally, the partial removable dental prosthesis was processed with a heat-polymerized denture base acrylic resin. The denture was then processed and finished (Figure-3)

7) The maxillary cast partial denture obturator was finished, polished, and inserted intraorally. At insertion of the maxillary cast partial denture obturator, the fit

and extension of denture base flanges were verified (Figure-4). Adjustments were made to compensate for the changes that occurred as a result of obturator processing. Pressure over the soft tissue was relieved with rotary cutting instruments. Also, the occlusion was evaluated with articulating paper. After the obturator prosthesis fit had been verified and adjusted and the occlusion corrected, the retentive clasp arms were activated.



**Fig-3: Obturator after finishing and polishing**



**Fig-4: Final insertion of the prosthesis**

8) The patient was instructed in hygiene procedures, and follow-up appointments were recommended every 3 to 6 months, or as needed, to evaluate the denture fit (especially the obturator fit at the entrance of the resection defect) and to examine the condition of the oral mucosa.

#### **SUMMARY**

The less retentive prosthesis/obturator is the main problem in acquired maxillary defect patients. The factors which affect the retention of obturator are size of the defect, remaining teeth, remaining bony structure and the ability and time taken by the patient to adapt to the prosthesis there are various causes for maxillofacial defects such as congenital and acquired. Communication can be created between oral cavity and maxillary sinus or nasopharynx by these maxillary defects. By using this impression technique described, it was possible, to make an accurate impression of the non-resected part of the maxilla and the resection defect. with proper designing and fabrication of the maxillary cast partial denture obturator we were able to achieve adequate closure of the resection defect with adequate obturator retention, stability, and support, thus improved oral function, speech, and esthetics. The patient's acceptance and adaptability plays an important role in success of obturator prosthesis. There are two treatment procedures for correction of the maxillary defects, such as surgical procedure or by prosthetic rehabilitation. The surgical treatment demands on more surgical procedure for the patient and it may lead to failure of graft material. The prosthodontic rehabilitation is easy and technically reversible.

#### **REFERENCES**

1. Vojvodic D, Kranjic J. A two-step (altered cast) impression technique in the prosthetic rehabilitation of a patient after a maxillectomy: A clinical report. *J Prosthet Dent* 2013; 110: 228-231.
2. Okay DJ, Genden E, Buchbinder D, Urken M. Prosthodontic guidelines for surgical reconstruction of the maxilla: A classification system of defects. *J Prosthet Dent* 2001; 86: 352-63
3. Roumanas ED, Nishimura RD, Davis BK, Beumer J. Clinical evaluation of implants retaining edentulous maxillary obturator prostheses. *Journal of Prosthetic Dentistry*. 1997 Feb 1;77(2):184-90.
4. Gu T, Shi C, Pu W, Yan W, Liu M, Yan M. New Progress on Certified Reference Materials for Platinum-Group Elements: IGGE GPt-8, GPt-9 and GPt-10. *Geostandards and Geoanalytical Research*. 2007 Jun 1;31(2):125-32.
5. King, C. E.: Dual-path design for removable partial dentures. *J Prosthet Dent* 39:392, 1978.