

# PROSTHODONTIC REHABILITATION OF HEMIMAXILLECTOMY PATIENT WITH CAST PARTIAL DENTURE AND HOLLOW BULB OBTURATOR: A CASE REPORT

\*Akanksha Ramkrushna Sonone, \*\* Santosh Daulat Shingote

\* Post-Graduate Student, \*\* Professor and Guide, Department of Prosthodontics and Implantology, VPDC Dental College, Sangli, Maharashtra University of Health Sciences, Nashik | Corresponding Author: Dr. Akanksha Ramkrushna Sonone, E-mail: akankshasonone22@gmail.com

<https://doi.org/10.55231/jpid.2023.v06.i02.03>

## Abstract:

*Obturator prosthesis is required for the restoration of speech, deglutition, and improvement of esthetics in patient after maxillectomy. The presence of oral tumors necessitates the surgical removal of all or part of the maxilla, leaving the patient with a defect that compromises the integrity and function of the oral cavity. The maxillofacial Prosthodontist, as a member of the surgical team, plays an important role in the recovery and rehabilitation of maxillectomy patient by fabricating and placing a surgical obturator. This clinical report describes the use of definitive hollow bulb obturator with cast partial denture framework for the treatment of a 65-year-old patient with hemimaxillectomy. This technique will improve the speech, mastication, swallowing and esthetics for the patient.*

**Key words:** *Cast partial denture framework, Hemimaxillectomy, Hollow bulb obturator*

## Introduction

Rehabilitation of maxillofacial defects can be challenging for maxillofacial Prosthodontist. Frequently, the contiguity of oral cancer necessitates the surgical removal of all or part of

the maxilla, leaving the patient with a defect that compromises the integrity and function of the oral cavity.<sup>1,2</sup> Postsurgical maxillary defects predispose the patient to hypernasal speech, leakage of fluid into the nasal cavity, and impaired masticatory function. The prosthesis needed to repair the defect is known as a maxillary obturator. An obturator (Latin: obturare, to stop up) is a disc or plate, which closes an opening or defect of the maxilla as a result of a partial or total removal of the maxilla.<sup>3</sup> The primary objective of intraoral prosthesis is to enhance function i.e. swallowing, mastication and speech thereby enhancing the psychological well being of the individual.<sup>4</sup> Successful obturation depends on the volume of the defect and the positioning of the remaining hard and soft tissues to be used to retain, stabilize and support the prosthesis.<sup>5</sup> The hollow bulb obturator design is an aid to improve the retention and the resonance of voice as it is light in weight.<sup>6,7</sup> Thus hollow obturator is the treatment of choice in such cases. This clinical report describes the fabrication of a hollow definitive obturator with cast partial denture framework for a patient with a unilateral acquired maxillary defect to improve retention, stability and support of the obturator.

## Case Report:

A 65 year old male patient reported to Department of Prosthodontics, Vasantdada Patil Dental College, with a chief complaint of difficulty in speech and mastication. The patient's dental history revealed that he had undergone surgical resection of left maxilla. He had a small soft tissue mass in oronasal region which went on gradually increasing and experienced breathlessness. The soft tissue mass was removed along with adjacent tissues and alveolar structures resulting into palatal defect. After 7-8 days the patient was given a delayed surgical obturator which he was using since 10-11 years (figure 1). Patient was not able to explain about detected pathology and neither report regarding his past treatment was maintained by the patient. On intraoral examination, class 1 Armany maxillectomy defect was found on the

left side.<sup>8</sup> The resection involved the hard palate, alveolar bone, teeth, and soft tissue. The operated site was well-healed. The Missing teeth were 11 and from 21 to 26 (figure 2). Severe attrition and extrusion of lower anterior teeth with reduced vertical dimension of occlusion.

In this present case the treatment objectives were:

- Establishment of vertical dimension due to severe attrition
- To maintain harmonious occlusion
- To restore function like phonation ,mastication and swallowing

## Esthetics

The patient's surgical obturator was relined



Figure 1



Figure 2



Figure 3: Facebow recorded



Figure 4: Bite recorded



Figure 5: cementation of crowns done

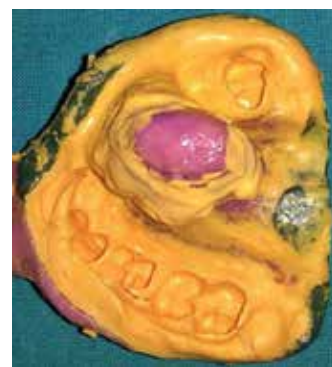


Figure 6: Final impression

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Official Publication of Indian Prosthodontic Society  
Kerala State Branch

and used as interim obturator without bulb. Establishing lost vertical dimension by giving crowns on remaining maxillary teeth followed by definitive hollow bulb obturator with cast partial denture framework replacing missing teeth were planned. Initially, an alteration in surgery from prosthetic point of view, the mucosal band connected to palatal defect was resected 3 months back to favorable type of defect to facilitate retention, stability and support. The maxillary and mandibular diagnostic impressions were made with irreversible hydrocolloid. Cast was poured with dental stone. Face bow record was made using orbitale as anterior point of reference and maxillary cast was mounted on Hanau wide Vue articular using facebow transfer. Mandibular cast was mounted using centric relation record.

The bite was raised by 3mm, as there was loss of vertical dimension and the mockup was done.<sup>9</sup> Tooth preparation for metal ceramic restoration was done with minimal occlusal reduction. The retraction was done. Impressions of the prepared teeth were made with vinyl polysiloxane. New facebow record was made (figure 3). A centric record was made with bite registration material (figure 4). Temporization was done. Wax patterns were fabricated with cast partial framework

components. The crowns were examined with Cingulum rest seat on 13, Occlusal rest seat on 14, 16 distally and mesially on 15, 17 and 27 and finally luted with glass ionomer cement (figure 5). Then undercut areas were blocked on diagnostic cast and spacer was adapted over cast. Auto polymerizing resin custom tray was fabricated for making final impression. Border moulding was done in defect area using low fusing compound (DPI Pinnacle Tracing Sticks). The final impression for definitive obturator was recorded using light-body elastomers (3M ESPE Soft putty) (figure 6). The master cast was made in die stone (Kalabhai ,Ultrastone) & duplicated in refractory material. Cast partial framework was planned with components. Embrasure clasp in relation to 14, 15 and 16, 17; Cingulum rest on 13; occlusal rest on 27; modified complete palatal type major connector extended till palatal surfaces of teeth.<sup>10</sup> Partial framework of the cast was fabricated with the help of various wax patterns. Casting of the metal framework was carried out. Trial of the finished and polished framework on cast & intraorally (figure 7) was done and needed adjustments were done. Wax occlusal rim was made on the framework. The jaw relations were recorded. After teeth arrangement try-in was done. The final prosthesis was fabricated with heat cured



Figure 7: cast partial denture framework on cast



Figure 8: Final prosthesis



Figure 9: postoperative view

resin material (figure 8). Final prosthesis was adjusted in patient's mouth (figure 9). Occlusal adjustments were done to make passive contacts on defect side. Final prosthesis was functionally and esthetically pleasing.

## Discussion:

In this present study, the patient had a well-healed defect so rehabilitation has been achieved with definitive hollow bulb obturator with cast partial denture framework. Hollow bulb provides advantages such as reduction in weight and making prosthesis comfortable. Here, Cast partial framework was planned for prosthesis because; with well-extended hollow bulb obturator it offered adequate retention, satisfactory occlusion, stability, durability and increases longevity.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

## Financial support and sponsorship

Nil.

## Conflict of interest

There is no conflict of interest.

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