

## Hollow Bulb Obturator for Rehabilitation of Maxillary Resection

Upreti S<sup>1</sup>, Thakur SN<sup>2</sup>, Mishra S<sup>2</sup>, Rajbanshi MK<sup>3</sup>

<sup>1</sup>Post Graduate Resident at Department of Prosthodontics and Maxillofacial Prosthetics, Chitwan Medical College, Chitwan, Nepal

<sup>2</sup>Associate Professor, Department of Prosthodontics and Maxillofacial Prosthetics, Chitwan Medical College, Chitwan, Nepal

<sup>3</sup>Lecturer, Department of Prosthodontics and Maxillofacial Prosthetics, Chitwan Medical College, Chitwan, Nepal

### ABSTRACT

Maxillary resection of tumors can result in significant functional and aesthetic challenges for patients. This case report describes successful rehabilitation of a patient who underwent partial maxillary resection following tumor removal. A custom-made hollow-bulb obturator was used to restore the oral function and facial aesthetics. This report outlines the treatment process, prosthetic design, clinical and prosthetic aspects of the interim obturator, prosthesis fabrication and patient adaptation.

**Key words:** Carcinoma; Hollow bulb obturator; Maxillary resection; Prosthetic rehabilitation

### INTRODUCTION

An obturator is a prosthesis used to close a congenital or an acquired tissue opening, primarily of the hard palate and/or contiguous alveolar structures.<sup>1</sup> There are three types of obturator which are used based on phase of treatment, they are surgical, interim and definitive obturator. surgical obturators are used immediately post-surgery to aid in initial healing and function. Interim obturators bridge the gap during the healing phase, providing essential functional and psychological benefits. Finally, definitive obturators offer long-term rehabilitation, restoring the patient's speech, mastication, and aesthetic appearance.<sup>2</sup>

Maxillary resection is often extensive which can lead to oro-antral communication leading to substantial defects affecting speech, functions,

and facial aesthetics. Interim prosthetic solutions plays crucial role in bridging the gap and enhance patient comfort and functionality.<sup>3</sup> A hollow bulb obturator is a well-established method for addressing these challenges, it is specifically designed to reduce the weight of the prosthesis while effectively closing the gap between the residual hard palate and the pharynx.<sup>4</sup> This type of obturator is crucial for helping the patient regain functions such as speech and swallowing, thereby maintaining their quality of life after surgery and alleviating psychological trauma.<sup>5</sup>

This case report presents the successful use of a custom-made hollow bulb obturator in a patient following maxillary resection.

### CASE REPORT

A 50 years old male visited Department of Prosthodontics and Maxillofacial Prosthetics at, School of Dental Sciences, Chitwan Medical College, Nepal, with the chief complaint of palatal deformity with loss of his teeth in upper left arch and wanted them to be replaced by a prosthesis to restore oral functions.

*Conflict of Interest: None*

#### \*Corresponding Author

Dr. Sagishma Upreti  
PG Resident, Department of Prosthodontics and  
Maxillofacial Prosthetics  
Chitwan Medical College, Chitwan, Nepal  
E-mail: sajismauprety94@gmail.com

A thorough intraoral examination was done. The left side of maxillary arch reveals palatal defect involving hard palate, alveolar ridge due to hemimaxillectomy involving left maxillary sinus. All Teeth on left side were missing. According to Aramany classification it was classified as Class I defect (Figure 1). The deformity lead to alteration in speech, mastication and facial appearance. The patient expressed a strong desire for functional restoration.

The treatment plan involved fabricating an Interim Hollow Bulb Obturator since the patient, who had undergone surgery at another center, did not receive a surgical obturator and was on nasal feeding upon arrival. As an immediate intervention, the interim obturator was planned to close the oro-antral communication and boost the patient's motivation. This was necessary because the definitive prosthesis would take time, and the patient had yet to provide clearance from the ENT, information on any remaining radiotherapy sessions, or the possibility of carcinoma recurrence.

### **FABRICATION OF PROSTHESIS**

Accurate impressions of the maxillary defect were made using irreversible hydrocolloid (Zhermack, Germany). A diagnostic cast was obtained for prosthodontic evaluation, and undercut were blocked with modelling wax (Figure 2).

In this case, obturator was made from clear acrylic with clasp on dentulous side one anteriorly and other posteriorly, (Figure 3) because occlusal relation on dentulous side was maintained with lower teeth on this particular teeth. After adding layer of acrylic over cast, salt was incorporated as hollow bulb component to reduce weight of prosthesis (Figure 4).

A try-in was conducted (Figure 5) to evaluate the fit, comfort, and function of the obturator. Adjustments were made to improve retention

and speech. The patient received instructions on using and maintaining the interim obturator and was advised to perform speech and swallowing exercises to adapt more quickly, especially since he had no prior experience with a surgical obturator.

The patient achieved significant improvements in speech clarity, comfortable swallowing and no nasal reflux with the hollow bulb obturator.

### **DISCUSSION**

The successful rehabilitation of this patient following partial maxillary resection underscores the importance of a disciplinary approach.

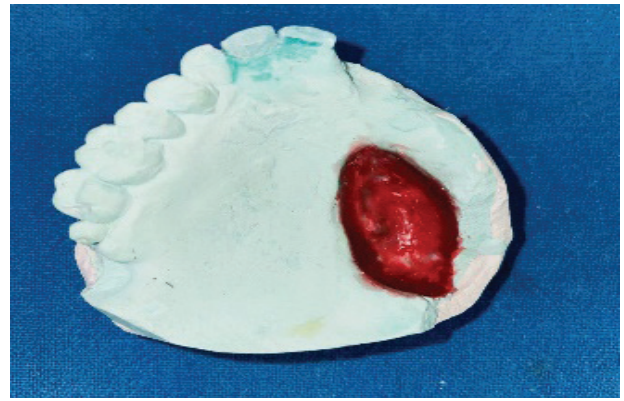
According to Blair et al. maxillary resection has a high level of morbidity with significant functional and psychological implications for the patient.<sup>6</sup> To re-establish functionality adequate closure of the defect is essential to prevent the passage of air, liquid and food between the nasal and oral cavity.<sup>7</sup>

In this case, an interim obturator was provided because the patient, who had been on nasal feeding for six months and had no history of using a surgical obturator, lacked medical clearance and relevant data, such as information on any remaining radiotherapy sessions or ENT clearance. His inadequate mouth opening and distress further complicated the situation. Given his distance from the hospital, the interim obturator was chosen to boost his confidence while awaiting clearance data and the opportunity to fabricate a definitive prosthesis. A definitive obturator is planned only after patient is prepared physically and emotionally for the restorative care.<sup>8</sup>

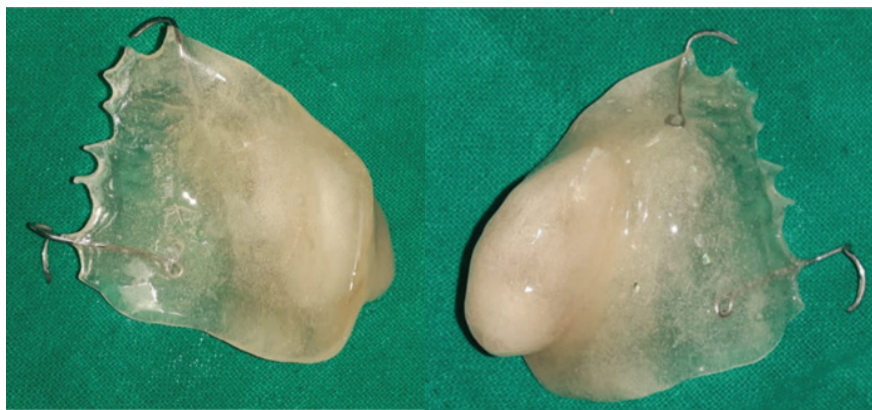
The bulb, or part of prosthesis extending into the defect, is usually hollow to reduce the weight of the prosthesis.<sup>5</sup> Different materials, such as sugar, salt and ice can be incorporated during fabrication process to produce a hollow bulb



**Figure 1.** Partial maxillary defect with respect to left side.



**Figure 2.** Cast obtained and undercut was blocked with modelling wax.



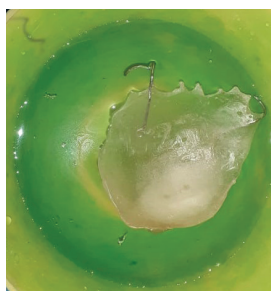
**Figure 3.** Hollow bulb obturator incorporating clasp



**Figure 4.** Placing salt as hollow bulb component



**Figure 5.** Intraoral picture after Insertion of obturator



**Figure 6.** Hollow bulb floating on water after removal of salt



**Figure 7.** Occlusion after insertion of obturator



obturator.<sup>9</sup> Here we have used salt to make bulb hollow as it is easily available, cheaper and easy to dissolve, thereby easy to fabricate prosthesis.

A multidisciplinary approach is essential for life-changing interventions like this, patients must be informed prior about the potential physical as well as psychological impacts following surgery. In this case, the absence of an early or delayed surgical obturator led to prolonged nasal feeding, inadequate mouth opening, and significant distress. Beyond providing a prosthesis, it's crucial to offer emotional support, reassuring the patient that there are ways to restore what has been lost.

## CONCLUSION

Custom-made hollow bulb obturators are crucial in rehabilitating patients after extensive maxillary resection due to tumors. This case report demonstrates successful outcomes in speech and swallowing, with the patient expressing happiness at the clarity of his voice and the ability to drink water through his mouth for the first time after surgery.

## INFORMED CONSENT

Informed consent was obtained from the patient for the publication of this case report and accompanying images.

## REFERENCES

1. Academy of Denture Prosthetics. Nomenclature Committee. Glossary of prosthodontic terms. Journal of Prosthetic Dentistry, CV Mosby; 1987.
2. Karim A. Definitive obturator rehabilitation on the maxilla defect post-tumor surgery. Indonesian Journal of Prosthodontics. 2022 Dec 3;3(2):101-4. DOI: <https://doi.org/10.46934/ijp.v3i2.130>
3. Suwal P, Shrestha P. Hollow bulb obturator in right total maxillectomy patient. Bangladesh J Med Sci. 2014 Nov 19;14(1):91-4. DOI: <http://dx.doi.org/10.3329/bjms.v14i1.16988>
4. Patil PG, Patil SP. A hollow definitive obturator fabrication technique for management of partial maxillectomy. J Adv Prosthodont. 2012 Nov;4(4):248-53. doi: 10.4047/jap.2012.4.4.248. Epub 2012 Nov 29. PMID: 23236579; PMCID: PMC3517965.
5. Ali MM, Khalifa N, Alhajj MN. Quality of life and problems associated with obturators of patients with maxillectomies. Head Face Med. 2018 Jan 5;14(1):2. doi: 10.1186/s13005-017-0160-2. PMID: 29329558; PMCID: PMC5795281.
6. Blair FM, Hunter NR. The hollow box maxillary obturator. Br Dent J. 1998 May 23;184(10):484-7. doi: 10.1038/sj.bdj.4809669. PMID: 9642863.
7. Prakash P, K Bhandari S, D'Souza DSJ. A novel technique to maximise retention in the rehabilitation of maxillectomy patients with three piece hollow bulb obturator – A case report. IP Ann Prosthodont Restor Dent. 2020 Dec 28;6(4):224-7. DOI:[10.18231/j.aprd.2020.047](https://doi.org/10.18231/j.aprd.2020.047)
8. Singh M, Bhushan A, Kumar N, Chand S. Obturator prosthesis for hemimaxillectomy patients. Natl J Maxillofac Surg. 2013 Jan;4(1):117-20. doi: 10.4103/0975-5950.117814. PMID: 24163568; PMCID: PMC3800374.
9. Krishna CH, Babu JK, Fathima T, Reddy GV. Fabrication of a hollow bulb prosthesis for the rehabilitation of an acquired total maxillectomy defect. BMJ Case Rep. 2014 Mar 26;2014:bcr2013201400. doi: 10.1136/bcr-2013-201400. PMID: 24671313; PMCID: PMC3975568.