



## Attachment Retained Hollow Definitive Obturator For A Post Mucor Maxillectomy Patient: A Case Report

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### ABSTRACT

*Mucormycosis is a fungal illness that affects the maxillofacial region, with a significant death and disability rate. The most prevalent predisposing factors for this disease include compromised immune disorders such as uncontrolled diabetes, leukemia, and chronic use of steroids. In such cases, aggressive surgical debridement with excision of affected maxillofacial features is the most common treatment procedure. A prosthodontist faces a major challenge while rehabilitating the resultant defects such as dislodgment of the prosthesis due to scarring of the excised soft tissues, absence of underlying bone, loss of PPS area, and immunocompromised status of patients all of which affect the defect's healing rate. Mucormycosispt who required a total single side maxillectomy is described in this clinical report. The definitive obturator was retained, supported, and stabilized using O ring attachments. The patient's mastication, deglutition, articulation, and midfacial profile were restored.*

*Keywords: Definitive obturator, maxillectomy, O-ring attachment*

Received 18.07.2022

Revised 14.08.2022

Accepted 24.10.2022

### INTRODUCTION

Mucormycosis is one of several opportunistic fungi that become invasive and pathogenic in people who have a weakened immune system or changed metabolic conditions. A branching, non-septate hypha infects and spreads through artery routes, causing thrombosis and tissue infarction. The nasal mucosa is the entry point spread to the paranasal sinuses, throat, palate, orbit, and brain. Prosthetic rehabilitation of the maxillofacial region has helped patients with acquired maxillary abnormalities improve their quality of life[1]. The extent of maxillofacial prosthetic treatment is determined by several criteria, including the defect's size and position, and the presence or absence of tissue undercuts around the defect cavity[2,3].

We attempt to keep the remaining dentition safe and sound by avoiding any stress more than they could bear during partial denture therapy. This is a more severe difficulty for maxillofacial patients because their soft tissue covering the residual ridge is fragile without any support underneath it. As a result, the appliance, which might be big and hefty, puts a lot of strain on the abutment teeth[4]. The shape and weight of the bulb are crucial in patients with substantial maxillary abnormalities, as the obturator's weight exerts dislodging and rotating stresses on the abutment teeth[5]. Combining intraoral magnets and dental implants increases the support and stability of the prosthesis[6]. This is supposed to significantly improve chewing, speaking efficiency, and deglutition[7]. Due to the expensive expense of implants, the only choice for rehabilitating maxillofacial patients was to adopt acrylic resin prosthesis. This case report aims to show the benefits and applicability of employing the O-ring stud prosthetic lab equivalent, which is a readily available material that can be used for maxillary obturator prosthetic rehabilitation in an Aramany class 1 condition[8].

### CASE STUDY

A 50-year-old female patient reported to the department OPD with difficulty in chewing food and speaking. There was a huge intraoral defect with oroantral communication on the right side of the maxilla with all teeth present on the left side. The muscles of the soft palate exhibited normal movement and

salivary flow was adequate. The oroantral communication and defect was Aramany class I, which was not crossing the midline (fig.1 and 2).

**The treatment plan included:**

- Metal ceramic full veneer crowns on teeth 21 and 22 connected with an Implant O-ring stud analog.
- Definitive two-piece hollow bulb obturator replacing teeth 11, 12, 13, 14, 15, 16, and 17.

**Treatment:**

U/L diagnostic impressions were made using alginate and poured with a dental stone, the size of the defect in the maxillary arch, periodontal condition of the remaining dentition, and availability of the space was evaluated.



Fig. 1 Pre-operative intra oral view      Fig.2 Intra oral frontal view

Tooth preparation was done for the metal-ceramic crown on the central and lateral incisor (fig 3), and final impressions were made with the putty wash technique. The cast was poured with die stone, and wax patterns for copings were fabricated. Implant O ring system used for implant-supported overdenture was procured, and the stud attachment was duplicated with the help of a putty index and pattern resin. The attachment was tried on the duplicated stud attachment to check for a good fit. (Fig 4) After that the duplicated stud attachment was attached to the pre-fabricated wax crown copings on the abutment using a connector.



Fig 3.Tooth preparation for PFM restoration      Fig 4. O ring attachment system.

Surveyor was used to ensure the stud attachment's parallelism with the abutment teeth. The framework and the attachment were cast using conventional technique. After the clinical trial of the framework, ceramic build-up was done and crowns were cemented with temporary cement on the abutment teeth.



Fig. 5 final impression with light bod      Fig 6. Master cast mounted on articulator

A special tray with a double spacer was fabricated on the diagnostic cast covering the affected area. A final impression was made after the defect site was border molded (fig 5). The cast was poured after the framework was removed from the patient's mouth and placed in the impression. Jaw relations were recorded and try un was done. Wax up was done and attachment was reattached on the metal head after dewaxing. The heat cure polymer was then packed in two stages: first, a thin layer of acrylic resin was packed in the cast's bulb area, then a cellophane sheet was placed over the bulb, and the rest of the acrylic resin was loaded into the mold and carefully closed and cured. Due to the existence of a cellophane covering, the bulb was easily separated utilizing light force during deflasking. After hollowing out the bulb with an acrylic trimmer while keeping the margins intact, the two halves were closely approximated and bonded with the use of cold-cure acrylic resin (fig 7).



Fig. 7 Finished definitive obturator Fig. 8 Frontal view of maxillary rehabilitation

Relief was added to the tissue surface of the prosthesis in the abutment area to lessen the forces imparted to the abutment teeth, allowing the O-ring attachment to move freely. The prosthetic was completed, polished, and sterilized before being put into the defect. The occlusion was equilibrated, and the tissue surface was modified to relieve pressure regions. After that, the patient was shown how to utilize the obturator prosthesis and given homecare instructions. The patient's speech has significantly improved. Her jaw movement has improved as well, thanks to the restored cheek support (fig 8). For further rehabilitation, the patient was referred to a speech therapist. For a year, the patient was evaluated every three months, and postoperative radiographs were taken. The outcome of the treatment was positive, and the patient has been functioning normally.

## DISCUSSION

Any patient who has a maxillectomy for Mucormycosis, radical therapy of a malignancy, or aesthetics has major mastication, swallowing, speaking, and aesthetics issues[9]. For these people, reconstruction is critical, but it is also a significant difficulty. The uneven palatal anatomy, the lack of dentition, and the loss of vestibular sulcus all make prosthesis manufacture more challenging [10]. A stable obturator prosthesis is required for successful functional and aesthetic recovery following maxillectomy. However, due to unfavorable postoperative conditions such as edentulous maxilla and/or severe resection, standard prosthesis treatment rarely results in a stable prosthesis[11].

When compared with the previous techniques, in the present case report, O ring attachment was utilized to enhance retention and stability of the prosthesis with a shorter treatment time and less morbidity. The degree of resistance to dislodgment when the prosthesis was pulled downward supported this. The O-ring attachment is categorized as a resilient attachment because it acts as a retentive device without transferring loads to the remaining abutment[12].

The real benefit of the implant attachment is that it offers greater force in removal, ease of insertion and removal, and patient comfort. The use of wire clasps on the remaining natural dentition improved retention even more. The weight of the prosthesis affects the ability to form an atmospheric seal, so this affects satisfactory function in partially dentulous patients with hard and soft palate abnormalities is difficult to achieve[13]. The weight of the prosthesis was lowered in this case by manufacturing it as a closed hollow prosthesis. Hollow bulb prosthesis has several advantages, including reduced weight of prosthesis, which is more comfortable and efficient [14]

The part of the prosthesis in contact with the defect area of the patient was polished and made absolutely smooth to avoid any trauma to the soft tissues and improve patient satisfaction. Despite employing acrylic resin obturator prostheses, the patient has expressed satisfaction with her ability to swallow, masticate, and create understandable speech. Following ablative surgery, obturator prosthesis made from

easily available materials can provide satisfactory functional and aesthetic results in patients with significant maxillectomy defects[15]

## CONCLUSION

Because maxillofacial deformities are so unique, the clinician must draw on all of his knowledge and experience to create a functioning prosthetic. Patients do not have the option of complete rehabilitation without a definite prosthesis. When supplying patients with prostheses for the acquired palatal deficit, there are many different presentations and obstacles, and the restorative dentist must be creative and ingenious. The key to a successful treatment, like with any other, is to understand and adhere to the principles

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## CITATION OF THIS ARTICLE

B K Yadav, S Guttal, P Ritwal, P Yadav, O Shetty, A Nagpal. Attachment Retained Hollow Definitive Obturator For A Post Mucor Maxillectomy Patient: A Case Report. *Bull. Env.Pharmacol. Life Sci., Spl Issue* [2]: 2022: 317-320