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## Case Report

# Prosthetic rehabilitation in patient with post COVID-19 rhino orbital cerebral mucormycosis - A case report

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### ABSTRACT

Mucormycosis usually occurs in patients with compromised immune system, and also in patients with uncontrolled diabetes, with rampant use of corticosteroids owing to the deadly triad of COVID-19 infection. The involvement in the maxillary region may need to be surgically resected and the debridement of the necrosed areas can lead to extensive maxillary defects which can create difficulties in the patient's normal function.

This case report describes the prosthetic rehabilitation of a patient with post COVID-19 rhino orbital cerebral mucormycosis.

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## 1. Introduction

The recent rise in cases of COVID-19 in India during the second wave of the pandemic had been associated with increase in reporting of invasive mucormycosis post COVID-19 due to the widespread use of corticosteroids in patients having uncontrolled diabetes mellitus. Rhino orbital cerebral mucormycosis, also known as zygomycosis, is a rare disease caused by an opportunistic pathogen, angiotropic fungus of order mucorales commonly found in immunocompromised individuals affecting nose, paranasal sinus and brain.<sup>1</sup> The mucormycosis infection can be aggravated either through direct invasion or via blood vessels leading to entry of the fungus in the arteries resulting in thrombosis which subsequently leads to necrosis of tissue in the oral cavity, the maxillary resection as a treatment modality may lead to extensive defects. The prosthodontist plays an important role in rehabilitation of patients with mucormycosis with an aim to improve their quality of life in individuals undergoing aggressive

debridement and need comprehensive restoration of the masticatory apparatus. This case report described the procedure of restoring maxillary defect using one piece closed hollow bulb obturator in post surgical mucormycosis patient.

## 2. Case Report

A 72-year old female patient, reported to the Department of Prosthodontics and Crown & Bridge, Seema Dental College and Hospital with a chief complaint of diminished masticatory function post surgical partial maxillectomy and she also complained of regurgitation of food from the nasal cavity and hypernasal tone of voice due to presence of oro nasal communication. Patient gave the history of testing covid-19 positive with uncontrolled diabetes and histopathological diagnosis revealed Rhinocerebral mucormycosis. At the time the patient reported her reports revealed fasting blood sugar 180mg/dl and patient was taking medications for the same. The patient seemed demoralized and was psychologically dealing with traumatic loss.

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**Fig. 1:** Pre operative view of patient feeding using Ryle's Tube

On extraoral examination, facial asymmetry and feeding using Ryle's tube was observed in the patient (Figure 1). Surgical orbital exenteration was also done in the Department of Ophthalmology, AIIMS Rishikesh and was referred for cosmetic rehabilitation after the healing phase.

Intra oral examination revealed Armany's class III defect with edentulous maxillary arch. There was presence of oro-nasal and oro-antral communication due to partial maxillectomy (Figure 2). Patient presented with poor oral hygiene.



**Fig. 2:** Intra oral view showing defect in maxillary region

After discussing the present oral condition of the patient, various treatment options were explained to the patient, and considering her age and compromised medical condition, fabrication of one piece, closed hollow bulb obturator was planned.

### 2.1. Procedure

The following clinical steps were carried out for the patient's oral rehabilitation.

#### 2.2. Primary impression

Initially the defect cavity was packed with sterile gauze to control the excessive flow of impression material from entering the nasal cavity after which preliminary impression using irreversible hydrocolloid material (Zelgan 2002) was recorded and cast was poured using dental stone type IV.

A Type I simple base plate obturator or an interim obturator was fabricated using autopolymerizing acrylic resin to block the defect area at the first appointment so that the patient could resume her normal masticatory function. Patient was also advised to remove Ryle's tube so that she could have her normal diet.

#### 2.3. Secondary impression

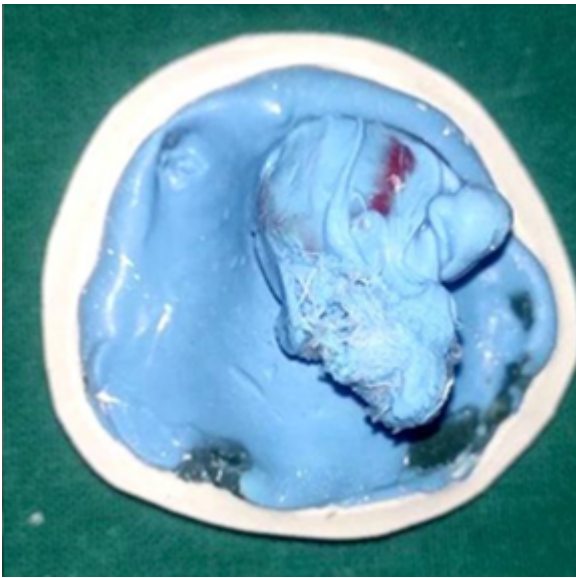
Custom tray was made using self cure acrylic resin on the primary cast. Tray was adjusted in the patient's mouth and trimmed, after which border molding was done using low fusing green stick compound and impression compound was used in the defect to provide support. Final impression was recorded using medium bodied polyvinyl siloxane impression material (Affinis, Coltene) (Figure 3). The final impression was poured using die stone material and unwanted lateral undercuts were blocked (Figure 4) and denture base was fabricated with autopolymerizing acrylic resin on the master cast.

#### 2.4. Tentative jaw relation

Occlusal rims were fabricated in the routine manner and tentative jaw relation records were obtained (Figure 5). Teeth shade was selected for teeth arrangement procedure. These records were transferred to a semi adjustable articulator for carrying out teeth arrangement.

#### 2.5. Try in appointment

The patient's centric relation was assessed. There was an improvement in the phonetics which was observed in the try in stage. Facial and functional harmony of the anterior teeth was checked and shown to the patient for approval of facial esthetics. (Figure 6).



**Fig. 3:** Border moulding and secondary impression



**Fig. 5:** Bite registration



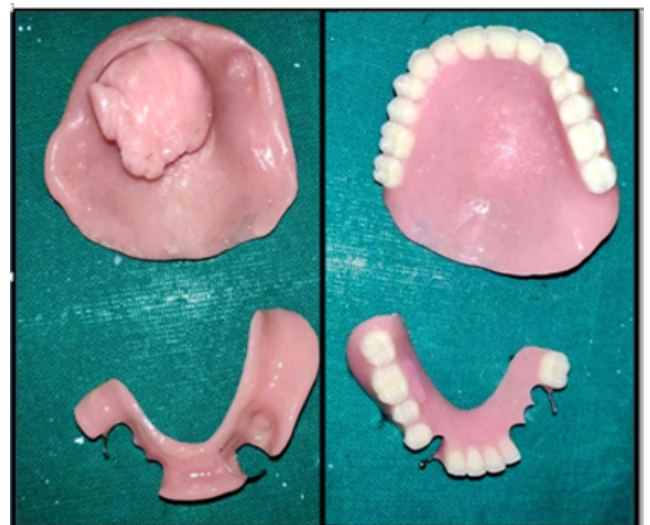
**Fig. 4:** High grade tumor budding in invasive lobular Ca (H&E, 40x magnification)



**Fig. 6:** Try in

### 2.6. Insertion of the obturator

The obturator was then cured using heat polymerized acrylic resin using lost salt technique. The obturator was punctured slightly to allow the escape of salt and later on patched using chemical cure acrylic resin. Finishing and polishing was then carried out in the conventional manner (Figure 7). The patient's centric relation was checked, along with improvement in phonetics, and the patient appreciated the final esthetics of the denture. The patient was finally asked to verify nasal regurgitation of fluids by asking her to drink water (Figure 8).



**Fig. 7:** Intaglio view and Occlusal view of the final prosthesis



**Fig. 8:** Insertion of Obturator

### 2.7. Follow up and maintenance

Post insertion instructions were given to the patient and explained to her caretaker for proper care and maintenance of the prosthesis (Figure 9). The patient was recalled after a day post insertion and then once in every 2 weeks interval for follow up. The patient was educated and motivated for meticulous oral hygiene for maintenance of the obturator.



**Fig. 9:** Post insertion frontal view

### 3. Discussion

Maxillofacial deformities can negatively affect the patient's physical and psychological health, resulting in serious psychiatric, familial, and social problems.<sup>2</sup> These deformities can be caused due to presence of malformation, congenital defects, pathologies and developmental disturbances, or may be acquired, as a result of post oncosurgery or trauma.<sup>3</sup> Maxillofacial prosthesis can immediately correct the defects that occur post surgery which may serve as a boon to their self esteem.<sup>4</sup> Several materials and techniques have been used in the literature for the fabrication of maxillofacial prostheses. However the choice of material and retentive aid depends upon the patient's specific esthetic demands, size and type of defect, their lifestyle and financial condition.

In defects pertaining to the maxillary region, the prosthodontist helps in rehabilitating the oral structures by allowing the patient to return to normal function of speech and mastication. Malignancies are commonly treated by surgical intervention leading to anatomical defects which may create communication between oral and nasal cavity.<sup>5</sup> To encounter this difficulty, obturators are fabricated. The major drawback associated with restoration of a large defect is the weight of prosthesis, as it may be very bulky leading to compromised retention. Hollow obturators are made to troubleshoot this problem. The materials available for the fabrication of prostheses is polymeric in nature, which include vinyl chloride polymer and copolymers, acrylic type and silicon rubbers (heat vulcanizing and room temperature vulcanization (RTV) and foaming type. Newer materials are also available like silicone block copolymers and polyphosphazenes.<sup>6</sup> However, due to economical restraints of the patient, acrylic resin was used for the fabrication of prosthesis. Numerous methods and techniques can be advocated for the fabrication of an open or a closed hollow bulb obturator. Both these types of obturators can be made for restoring the oral cavity as they are lightweight prostheses which can easily be accepted by the patient.<sup>7</sup> However, the major disadvantage that is associated with open type is that it can accumulate food and mucous which may in turn lead to bad taste and odor. This problem can be resolved by acquiring addition of numerous cleanings or vents to the prosthesis to eliminate the accumulation in the bulb.<sup>8</sup> This is the reason why a closed hollow bulb obturator was planned for the present case with Aramany's class III maxillary defect.

### 4. Conclusion

Oral and facial deformities either acquired or congenital, is seen in a large segment of the population. The prosthodontic rehabilitation in such patients appeared to have a positive impact on their quality of life, particularly on social relations and self-esteem. The primary objective

of rehabilitation is to preserve and restore the functional activities and esthetics of the patient so that they can return to society with confidence which was affected due to maxillofacial defect.

## 5. Source of Funding

None.


## 6. Conflict of Interest

None.

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