

**Rehabilitation of complete maxillectomy patient effected by mucormycosis post covid infection with hollow bulb obturator using lost salt technique - A case report**

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**Conflicts of Interest:** Nil

**Abstract**

Mucormycosis is a rapidly progressing fungal infection involving the nose and paranasal sinuses of head and neck region with high mortality and morbidity. It is predominantly seen in compromised immunological conditions like uncontrolled diabetics mellitus, Leukaemia, prolonged use of steroids. Aggressive surgical debridement including resection of involved maxillofacial structures is the treatment protocol in such conditions. Rehabilitation of acquired maxillary defects is challenging, and the goal is usually achieved by closing the oronasal communication which is retentive and has a stable seal using an obturator. This clinical report describes prosthetic rehabilitation of a patient with residual maxilla secondary to surgical management of complete maxillectomy by fabricating a hollow bulb obturator using lost wax technique for better retention

and stability of the prosthesis and thereby providing complete functional and Esthetic rehabilitation of the patient.

**Keywords:** Mucormycosis, hollow bulb obturator, lost salt technique.

**Introduction**

Mucormycosis was first described by “Paltauf” in 1885. It is a rapidly progressive, fulminant and life-threatening infection. It caused havoc during the catastrophic COVID-19 epidemic's second wave by a rapid and deadly surge with up to a 50% fatality rate. While the actual reason for its sharp rise is still unknown, it has been discovered that diabetics and immunocompromised patients who have recovered from COVID-19 infection are more susceptible to mucormycosis.<sup>(1)</sup>

It leads to ciliary dysfunction, cytokine storm, thrombo-inflammation, microvascular coagulation, and eventual

immune exhaustion. This facilitates secondary bacterial and fungal infections, especially in critically ill patients.

The infection begins in the nose and paranasal sinuses due to inhalation of fungal spores. This infection can spread to the orbital and intracranial structures by direct invasion or through the blood vessels.<sup>[2]</sup>

This article describes the rehabilitation of a patient who had undergone complete maxillectomy due to post COVID-19 mucormycosis with a completely hollow light weight prosthesis fabricated using lost salt technique

### **Case report**

A 48yr old female patient reported to Bowring and Lady Curzon hospital with a chief complaint of fever, nasal obstruction, swelling of right eye and pain and swelling of face since last 3 months. She complained of moderate pain which aggravated on bending head and chewing food beside nasal congestion and headache.

On examination, an extensive bony erosion was seen involving maxillary alveolar process and hard palate crossing the midline. Patient was advised for a CT and MRI scan. CT scan showed mucosal thickening in bilateral residual maxillary, ethmoid and sphenoid sinus. MRI reports suggested polypoidal mucosal thickening involving bilateral frontal, ethmoidal, maxillary and sphenoidal sinus. Hence, patient was diagnosed with mucormycosis and was advised a total maxillectomy with bilateral endoscopic sinus surgery with bilateral orbital decompression under general anaesthesia.

After a healing period of 3 months the patient was recalled for an interim obturator.

On extra oral examination collapsed mid facial region with limited mouth opening was seen post operatively. On intraoral examination an ovoid large defect involving the alveolar ridge, hard and soft palate crossing the midline was seen. The patient was completely

edentulous w.r.t maxilla. The mucosa surrounding the defect had healed completely and the borders of the defect were well defined. Based on the size of the defect A hollow bulb interim obturator was planned for the patient using lost salt technique.

A preliminary impression was obtained using irreversible hydrocolloid with a gauze tied to a thread placed in the defect area. The preliminary cast was poured with dental stone class III to analyse the defect and a custom tray was fabricated using auto polymerizing resin.

Sulcus depth was recorded using green stick compound and impression compound was used to record the defect area, followed by a definitive wash impression of the maxillary defect and the residual ridge was obtained using light body polyvinyl siloxane impression material. Denture base with extension in the defect was made and occlusal rims were fabricated with modelling wax for bite registration.

After bite registration mounting was done on mean value articulator and try-in procedure was followed.

The denture was waxed up and invested in a denture-curing flask and acrylised to fabricate a hollow bulb obturator using the lost salt technique. After processing, the salt was removed by injecting water. The open bulb was closed using auto-polymerizing resin. After the acrylic had set, the obturator was trimmed, finished, polished and delivered to the patient.

### **Discussion**

Rehabilitation of acquired maxillary defects is challenging, and the goal is usually achieved by means of micro-vascularised flaps or by prosthetic intervention. Reconstructive surgeries are done when extensions of the defects are small. Prosthetic rehabilitation is a better alternative for larger defect and the prosthesis that is,

fabricated to repair the defect is called as a maxillary obturator.

The aim of a maxillofacial prosthodontist is to rehabilitate a maxillary defect by closing the oronasal communication which is retentive and has a stable seal using an obturator.

The first step in fabricating such extensive defects is making an accurate impression of basal tissues & or adjacent teeth is the stepping stone to making a denture with good retention, stability and support.

In this case border moulding was done with green stick compound followed by impression compound to record the defect region and then followed by a wash impression taken with light body polyvinyl siloxane impression material. This is done because impression compound can be moulded easily and repeatedly to record the defect area correctly.

The success of a total or subtotal maxillectomy prosthesis depends mainly on the volume of the defect and the amount of healthy soft and hard tissues left postoperatively to provide better retention and stability to the prosthesis. The weight of the prosthesis can act as a dislodging force; hence a light weight prosthesis is preferred.

The fabrication of a hollow bulb obturator in patients with severe maxillary defects can provide retention and stability by decreasing the weight. There are many techniques for fabricating hollow bulb obturators. Different materials, such as sugar, salt and ice, can be incorporated into the resin during the packing stage to produce a hollow bulb obturator. MA talon and LA Fuente used sugar during the processing of the obturator, which was removed by drilling a hole. El Mahdy et al. described the two-flask technique to process the obturator and the tooth portion separately. Mc Andrew et

al. fabricated the prosthesis in two halves and sealed them using auto polymerizing resin.

In this case the hollow bulb obturator was made using the lost salt technique. Table salt was filled in the defect area and acrylic resin was used to cover the opening. After curing, a small hole was made on the base of the hollow bulb and water was used to remove the salt completely. The hole was then sealed using auto polymerizing resin and was finished and polished. This technique reduces the laboratory time considerably.

### **Conclusion**

This technique is simple, quick, and economical method for construction of a hollow bulb obturator for acquired maxillary defects.

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#### Legend Tables



Figure 1: pre-operative image of patient



Figure 2: pre-operative intraoral view

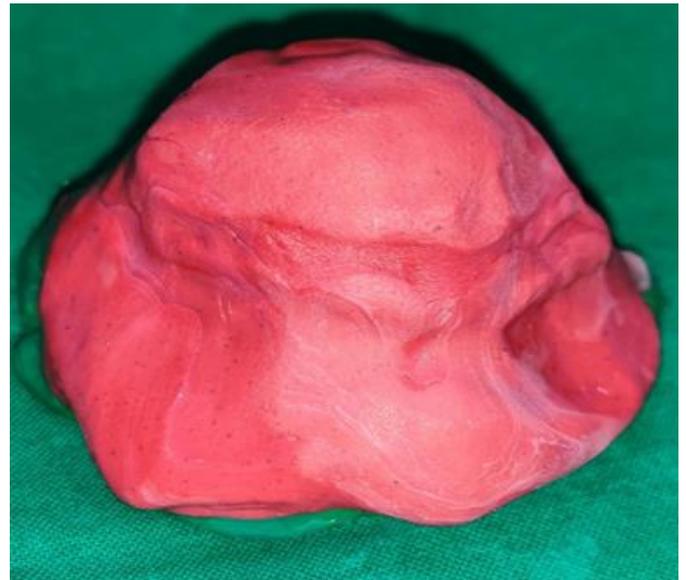


Figure 3: border moulding and impression of the defect using impression compound

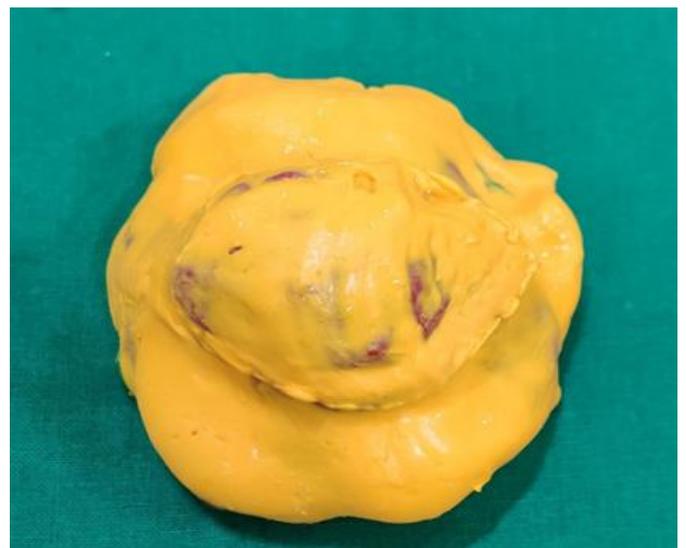


Figure 4: secondary wash impression taken



Figure 5: try-in done



Figure 8: post operative extraoral image



Figure 6: final prosthesis with the hollow bulb obturator



Figure 7: post operative intraoral image