

# Prosthetic Rehabilitation of Mucormycosis Patients in the COVID 19 Pandemic

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## Abstract

The COVID 19 pandemic has affected people worldwide, leading to psychological, financial, educational and economic distress. The world has been experiencing numerous post COVID complications. In India the emergence of mucormycosis is being reported with an alarming rise in the number of cases. Often, mucormycosis requires surgical debridement of the infected tissues. Prosthetic rehabilitation is not only involved in pretreatment planning but also in the construction of temporary or permanent post treatment appliances which help the patient to live a normal life. This case report describes the prosthetic rehabilitation of a patient affected by mucormycosis by means of a hollow bulb obturator supported by cast partial denture framework along with an extra coronal attachment.

**Keywords:** Mucormycosis • COVID 19 pandemic • Cast partial denture • Extra coronal attachment • Hollow bulb obturator

## Introduction

The first case of COVID 19 was reported on November 2019 in Wuhan city, China. Since then the world has been suffering from this pandemic and by each passing day, post COVID complications have risen in the society. The surfacing of mucormycosis is being reported globally, with a dreadful rise in the number of cases from developing countries including India [1].

- The treatment includes four step
- Early diagnosis
- Reversal of underlying predisposing risk factors, if possible
- Surgical debridement where applicable
- Prompt antifungal therapy and early post-surgical rehabilitation.

The prosthodontist serves as a full member of the rehabilitation team and ordinarily is involved in pre-treatment planning as well as the construction of temporary or permanent post treatment appliances. Frequent observations in such patients include: Altered bolus transport, drooling, altered nasal reflux and aspiration which may lead to more serious problems of pneumonia, weight loss and dehydration. Many recent developments in polymer research and in the fabrication of appliances have permitted the maxillofacial prosthodontists to rehabilitate these patients physically and psychologically. Thus, this case report describes the prosthetic rehabilitation of mucormycosis patient by means of cast partial denture with extra coronal attachment and a unique way to fabricate a hollow bulb obturator.

## Case History

A 51-year-old female patient reported to the Department of Prosthodontics with a chief complaint of nasal discharge during eating, swallowing and unclear

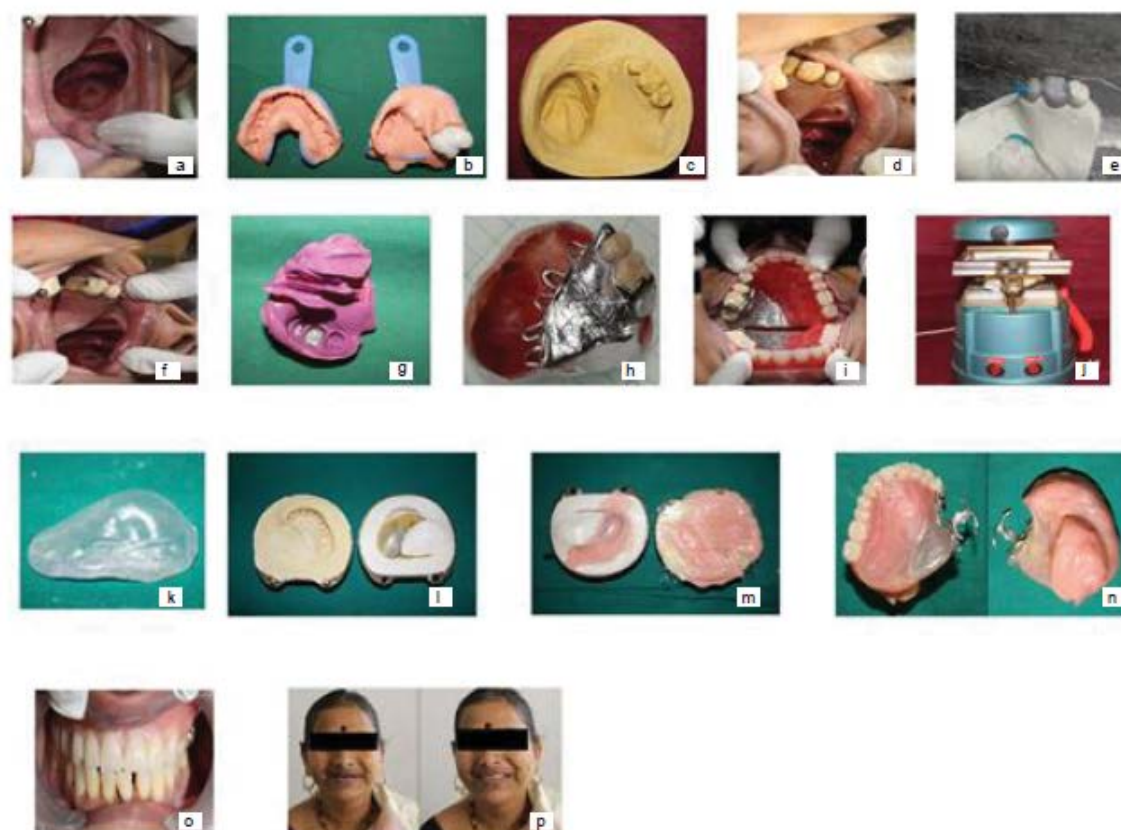
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sound. Medical history revealed that the patient was diabetic and suffered from COVID 19 infection 6 months back. After 3 months patient was diagnosed with mucormycosis and debridement along with surgical resection was carried out. Intra oral examination revealed a large maxillary defect extending from the right alveolar bone till the tuberosity, along with missing base of maxilla and palatal bone which is categorized as are many Class IV defects [2]. Since the intra oral defect was very large and only three teeth (25, 26 and 27) were remaining, prosthetic rehabilitation became difficult because of the weight of the prosthesis and inadequate bone support. To overcome this, an extra coronal attachment (CEKAPRECI- SAGIX) was utilized for the retention of hollow bulb obturator supported by cast partial denture framework (Figure 1).

1. Irreversible hydrocolloid was used to make diagnostic impression with sterile gauze packed into the defect.
2. Surveying of the diagnostic cast followed by proper designing of the prosthesis was carried out.
3. Since only few teeth were remaining in the arch, additional retention was planned by fabricating splinted prosthetic crowns along with the extra coronal attachment. (Cekapreci-Sagix)
4. Tooth preparation was done and impression was made with silicon impression material.
5. Crown prosthesis trial was done, custom tray was fabricated and border moulding was carried out using head and neck movements, breathing and swallowing exercises and pick up impression of crown prosthesis with the female component of the attachment was done for the fabrication of cast partial denture.
6. After the fabrication of cast partial denture, porcelain fused to metal crowns with extra coronal attachment was cemented intraoral.
7. Cast Partial denture framework trial was done.
8. Face bow record with jaw relation was mounted on the semi adjustable articulator.
9. Try in was carried out.
10. Since the defect was large an innovative method to make the obturator hollow was done with the help of thermoplastic bulb.
11. For the fabrication of hollow bulb, first a thermoplastic template was adapted on the master cast. The defect area was packed with gauze followed by adapting another template over it to seal the open end of the obturator.



**Figure 1.** Prosthetic rehabilitation of mucormycosis patients in the COVID 19 pandemic.

(a) Intra oral defect occlusal view; (b) Diagnostic impression; (c) Diagnostic cast; (d) Tooth preparation; (e) Wax pattern with ceka sagix attachment; (f) Trail of crown prosthesis with attachment; (g) Pick of impression for cast partial denture with female attachment; (h) Fabrication of cast partial denture; (i) Cast partial denture frame work trail; (j) Biostar machine for template preparation; (k) Thermo plastic bulb; (l) Trail of bulb before packing; (m) Incorporation of bulb during packing; (n) CPD after processing; (o) Insertion of final prosthesis; (p) Pre and post operative extra oral frontal view.

12. A small part of the 2nd adapted template was cut and the packed gauze was removed with the help of tweezers. The cut end was then sealed with a heated flame forming the lid of the bulb.
13. This thermoplastic bulb was incorporated into the defect during packing, which made the bulb light weighted and did not require sealing with self-cure acrylic which can be a potential site for micro leakage.
14. The final denture was inserted with intra oral lining of the defect area with soft tissue liner.
15. Patient was recalled after 24 hrs to check for any discomfort caused by the bulb part of the prosthesis.

## Discussion

World Health Organization (WHO) declared the COVID 19 disease as a global pandemic on March 11, 2020 [3]. With the dramatic surge of COVID 19 cases in India, post COVID complication like mucormycosis has risen exorbitantly. The primary route of infection is via air spore inhalation, which deposits in the paranasal sinuses and the lung [4]. Other routes less frequently encountered result from ingestion or direct skin inoculation. On May 2021, Department of Health Research, Ministry of Health and Family Welfare, Government of India has decided to set up a multidisciplinary approach team including prosthodontist as a rehabilitation member [5].

Postsurgical defects predispose the patient to hyper nasal speech, fluid leakage into the nasal cavity, impaired masticatory function, and in some patients, varying degrees of cosmetic deformities. Prosthodontic rehabilitation for such patients with acquired surgical defects can be categorized into 3 phases of treatment [6]. The initial phase is called "surgical obturation" and

entails the placement of a prosthesis at surgery or immediately thereafter which will act as a guide for resection. This prosthesis must be modified at frequent intervals to accommodate for the rapid soft tissue changes that occur within the defect during the organization and healing of the wound. The second phase of postsurgical prosthodontic treatment is called "Interim obturation". The objective of this phase is to provide the patient with a comfortable and functional prosthesis until healing is complete. Three to six months post-surgery, the surgical site becomes well-healed and dimensionally stable, thus permitting construction of the definitive prosthesis or the third phase of prosthodontic therapy [6].

In this case report rehabilitation of patient affected by mucormycosis was done by a hollow bulb obturator attached to cast partial denture framework which is a long term and definitive treatment option for the patient. The prosthetic appliance not only closed the intra oral defect area but also improvised the mastication and speech problems [7-9]. Since the defect was large additional retention was planned with the help of extra coronal attachment by Ceka Preci-Sagix which helps to maintain functional stability [10,11]. An innovative method was used to fabricate the hollow obturator to reduce the weight of the prosthesis and eliminating the use of self-cure acrylic for sealing which avoided micro leakage.

## Conclusion

The treatment of mucormycosis comprises of a multidisciplinary approach which includes proper diagnosis, treatment planning and post-surgical rehabilitation. Prosthodontic rehabilitation with an obturator along with cast partial denture accounts for complete rehabilitation of oral, physical, physiological and psychological wellbeing of the patient.

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## Conflict of Interest

No conflict of interest related to this article.

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