



Prosthetic rehabilitation of maxillary defect using obturator - A case report

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Abstract

Intraoral defects in the maxilla cause communication with the nasopharyngeal complex. The surgically removed palate has a devastating effect on the appearance and speech of the patient. The prosthodontic rehabilitation of maxillary defects is a challenging and demanding task which requires careful pre-surgical and post-surgical planning. A prosthodontist encounters problems such as absence of support, poor retention, and lack of prosthesis stability in treating these patients. The present case Report describes a procedure to fabricate a definitive obturator prosthesis for the rehabilitation of a total maxillectomy defect.

Keywords: maxillectomy, mucormycosis, obturator, prosthesis, rehabilitation

Introduction

Mucormycosis, an angio-invasive opportunistic fungal infection, was a “talk-of-the-town” in the COVID-19 pandemic era.¹ The most frequent causes attributed to the rise of mucormycosis in COVID-19 patients are uncontrolled diabetes, the excessively dispensed corticosteroids for suppressing the cytokine storm, and long-term hospitalization in the intensive care unit.² India contributed to approximately 45% of the new cases detected globally and nearly 34% of the deaths globally during the third week of May, 2021.³ Mucormycosis (earlier called Zygomycosis) is a rare but severe fungal infection caused by a group of molds called mucormycetes.⁴ It is a potentially lethal infection occurring primarily in immunocompromised patients, particularly

in those with diabetes mellitus, haema to logical malignancy, haema to poieticstemcell trans plantation, and soli dorgan trans plantation.⁵

The infection in the maxillofacial region can lead to a debilitating condition for the affected patient which may cause facial disfigure ment, impaired functions like speech due to hypernasality, rumination, and a significant impact on patient's quality of life.⁶The infection begins in the nose and paranasal sinuses due to the inhalation of fungal spores.⁷ This infection can spread to the orbital and intracranial structures by direct invasion or through the blood vessels.⁸ The fungus invades the arteries leading to thrombosis that subsequently causes necrosis of hard and soft tissues.⁹ Early diagnosis and treatment can reduce the morbidity and mortality of this lethal fungal infection. Treatment principles may include anti-fungal agents along with surgical debridement or resection.^{8,9}

This article describes the fabrication of a customized obturator for the reha bilitation of a patient with maxil lectomy of the maxilla due to post-covid mucormycosis. The role of the prosthodontists in reha bilitating such patients can be challenging as well as rewarding if proper protocols are followed. Prosthodontic rehabilitation by an obturator gives the advantage of improving the overall quality of life for the patient before definitive treatment can be provided.

Case Report

A 54-year-old Male patient was refered to the Department of Prosthodontics, Crown and Bridge, Pandit Deendayal Upadhyay Dental College and hospital, Solapur with a complain of difficulty in eating Food, nasal regu rgitation and speech problemas shown in figure 1. On taking the medical history, the patient was suspected with Covid-19 infection earlier as the patient had difficulty in breathing.

The patient developed symptoms of mucormycosis like blocked nose, pain in tooth and swelling on the left side of the face. He was diagnosed with post-covid mucor mycosis later. Endo scopic Sinus Surgery with total Maxi lectomy of the left maxilla was done eight months back.



Figure 1: extraoral appearance of patient

Intraoral examination revealed large maxillary defect on the left side with or antral - communication and parti ally dentulou sarch. As shown in figure 2 and 3 below. The treatment plan was to fabricate a definitive ob turator with a cast partial metal frame work.



Figure 2 and 3: intraoral view

Prior to impresi3n Mak ing the defect was blocked with a gauze piece lubricated with petroleum jelly. An irreversible hydro colloid preliminar y impresi3n was made of the maxillary and mandibular arch using stock

impresión trays as shown in fig. 4. The impresión was the n Pou red with type III dental Stone.

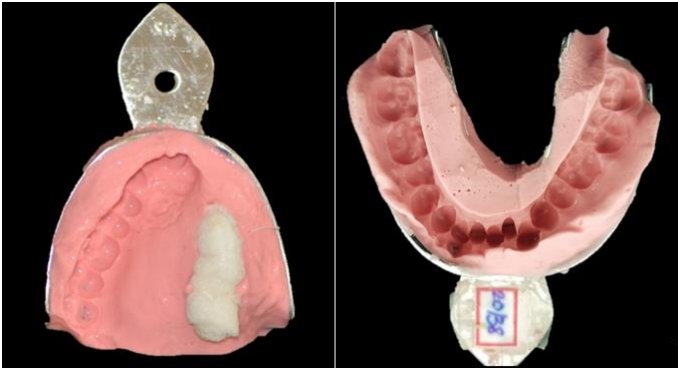


Figure 4: primary impression made using stock impresión trays

After obtaining the primary cast as shown in figure 5, a special tray was fabricated with self-cure acrylic resin (DPI RR Cold Cure) as shown in figure 6.

Border moulding and the full extent of the defect was recorded using green stick material (DPI Pinnacle tracing sticks) and wash impression was made to record the undercuts which aid in anatomic retention with monophas poly ether impression material (3M™) as shown in figure 7.

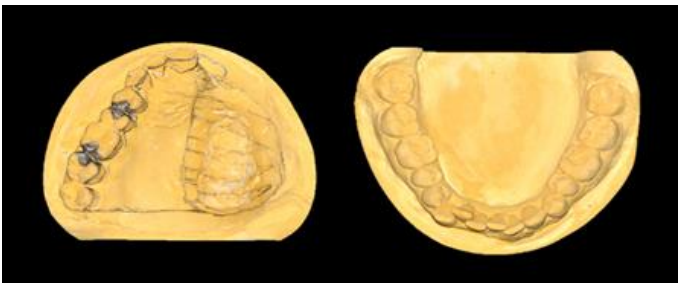


Figure 5: primary cast

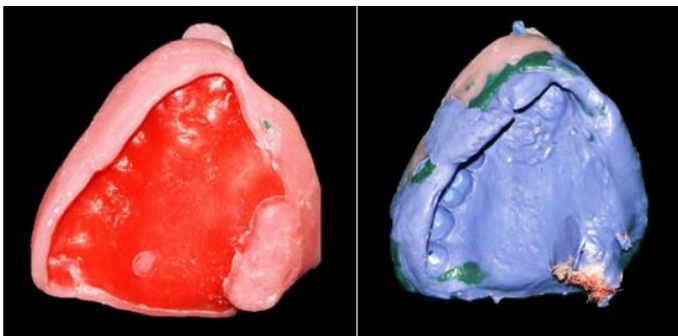


Figure 6 and 7: fabrication of special tray with self-cure acrylic resin and a polyether wash impression

Final impresión was then poured with using type IV die stone. After the master cast had been obtained, a cast partial framework was fabricated on the refractory model and trial done. as shown in figure 8. occlusal rim was fabricated on cast partial framework to make occlusal registration record with the help of which casts were mounted and cross-linked acrylic teeth were set.



Figure 8: cast partial denture framework

A jaw relation record was then obtained and mounted on semi adjustable articulator as shown in figure 9 and 10. After mounting teeth arrangement has been done and the trial denture was then tried in the patient's mouth as shown in figure 11.



Figure 9: facebow transfer.

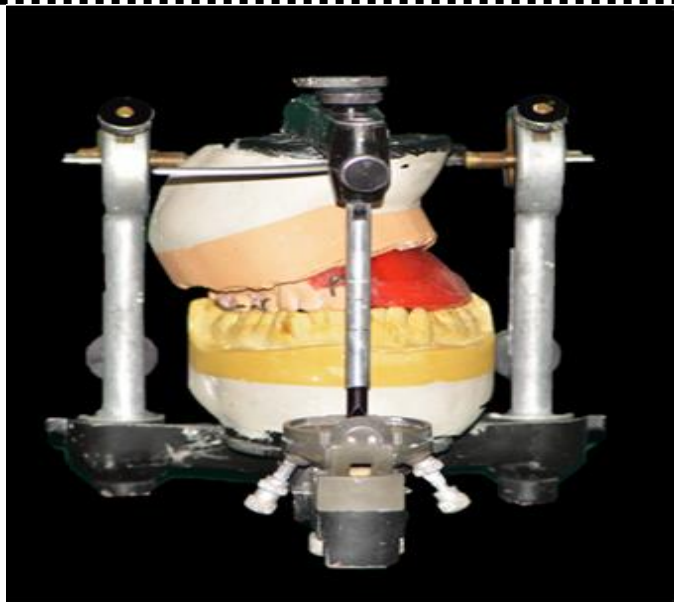


Figure 10: showing Mounting on H2 articluator.



Figure 11: try in of trial denture

The denture was invested in a denture-curing flask and acrylised to fabricate an obturatoras shown in figure 12a and b below.



Figure 12: flasking and counter flasking

The obturator was finished and polished as shown in figure 13 and then delivered to the patient with intraoral adjustments. The patient was instructed about the main tenance of the prosthesis and periodic recall check-up.

The patient on recall reported improved masticatory function and phonetics as well.

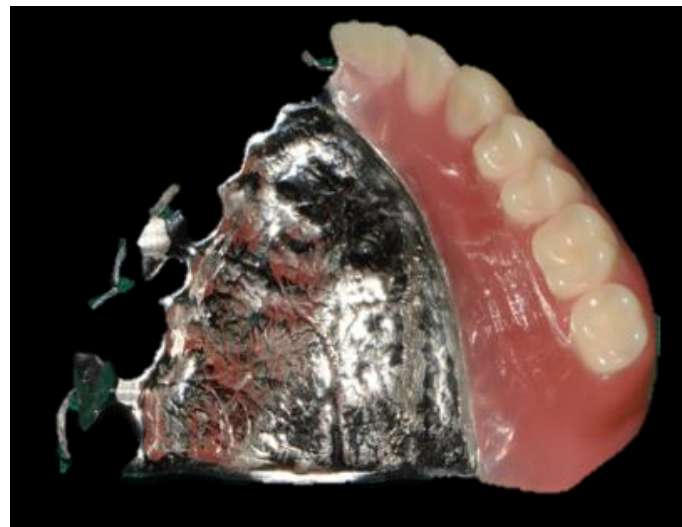


Figure 13: finished and polished acrylised prosthesis

Titanium cast framework was chosen as it is half the weight of Cobalt (Co)-Chromium (Cr) framework. If Co-Cr is used, it may affect the retention of the prosthesis due to added weight of the obturator. Obturator with CPD improved the retention, stability, speech & phonation and masticatory efficiency of the patient.



Figure 13: antero-posterior view with the fabricated prosthesis

Discussion

It is really a tough task to rehabilitate acquired maxillary defect as it presents with functional and facial deformity. It becomes a great challenge to the prosthodontist to restore the form, function, and the esthetics of such patients.¹⁰

In the above documented case, the aim was to eliminate the communication of the oral and nasal cavity by giving an obturator prosthesis which not only provides adequate functions of chewing, swallowing, and speech but also gives an acceptable esthetic appearance.⁹ Extension of the bulb into the maxillary defect helps in providing resonance during the speech.¹⁰

Obturator prostheses are commonly used for the rehabilitation of patients with maxillary defects.¹²The primary goal of the obturator prosthesis was to cover the defect and separate the oral cavity from the nasal cavity. It is preferred over surgical reconstruction as they are easy to maintain, and easy to fabricate and most importantly the cavity underneath the obturator can be examined at any time to check for the signs of tumor recurrence.⁶⁻⁸ Other advantages of fabrication of obturator includes decrease in the fluid leakage into the nasal cavity & sinus cavity, also improves the efficiency of mastication, swallowing and speech.¹¹⁻¹²

There are numerous other techniques available for taking support for prosthetic rehabilitation by placement of zygomatic and pterygoid implants.¹³ Owing to great psychological and financial impact maxillary resections and long Covid symptoms had on these patients, obturators were agreed upon as they had shorter treatment duration, were relatively inexpensive and provided a sense of immediate relief to the patient in terms of phonetics and mastication.¹⁴⁻¹⁵

Conclusion

Rehabilitation of the maxillectomy defects is complex and challenge to prosthodontists. A proper treatment method has to be selected for the defect coverage. Rehabilitation with obturator and CPD prosthesis appears to be a functional and effective treatment modality. This article describes the fabrication of an interim customized obturator for the rehabilitation of a patient with maxillectomy of the maxilla due to post-covid mucor mycosis.

The obturator provided to the patient increased function by providing better masticatory efficiency, phonetics by adding resonance, and also improved the esthetics.

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