

Prosthetic Rehabilitation of Rhino-Cerebral Mucormycosis Patient - A Case Report

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Abstract: Due to the lethal triad of COVID-19 infection, diabetes, and widespread corticosteroid use, mucormycosis—an uncommon fungal infection associated with diabetes is becoming quite common. The article's case study explains prosthetic rehabilitation for a deformity resulting from a maxillectomy. The case report focuses on the prosthetic rehabilitation of individuals who have developed maxillectomy abnormalities following COVID-19 infection-related mucormycotic necrosis, as well as strategies to address associated comorbidities such as tissue deficiency. The patient undergoing the maxillectomy had uncontrolled blood sugar levels and a COVID-19 contraction, which resulted in a superinfection of mucormycosis. The case study describes a method for creating hollow obturator prosthesis using a lost salt approach and a functional impression technique to get retention and support from the remaining soft and hard tissues in order to address complications such as a lack of supporting structures. Depending on the clinical obstacles faced, prosthetic rehabilitation in such difficult instances must be modified.

Keywords: maxillectomy, lost salt technique, functional impression

1. Introduction

Physicians have been aware of mucormycosis due to its detrimental pathophysiology, since serious fungal infections have become more common during the COVID-19 pandemic. Not only it is potentially lethal, but following surgery, the patients lose significant maxillofacial structures, which severely traumatizes them mentally. It is therefore impossible to overestimate the significance of a prosthodontist's role, especially in cases of rhinocerebral mucormycosis when there is a high requirement for maxillofacial rehabilitation after surgery. Therefore, a detailed understanding of the disease's cause, course, and available treatments is necessary before addressing the maxillofacial deformity itself. The purpose of this clinical report is to present a summary of a patient's prosthodontic rehabilitation for a maxillectomy defect.

2. Case Report

A 75-year-old male patient, status-post maxillectomy for a case of mucormycosis, reported to the Department of Prosthodontics in AME's Dental College, Raichur with the chief complaint of defect in the posterior right side of palate and missing teeth in the right maxillary arch that affected his aesthetics and masticatory function. The patient also complained of nasal regurgitation of food, hypernasality of voice and unintelligible speech. At the time of presentation, the patient was moralized and psychologically stable. On extraoral examination, facial asymmetry was found. His past medical history revealed that the patient had uncontrolled type II diabetes mellitus for which he had been on medication for the past 15 years. The patient was malnourished and was taking nutritional supplements for the

same. The patient was diagnosed with mucormycosis of the right maxillary sinus 3 years earlier for which he underwent surgical debridement prior to presentation.

On intraoral examination of the patient, a maxillary defect was seen on the right side of the palate. The defect showed its extension from the central incisor region to the posterior aspect of the hard palate. The mediolateral extension was from midpalate region to the buccal mucosa. The patient had a partially dentate maxillary arch with 8 teeth (21, 22, 23, 24, 25, 26, 27, 28). The oral side of the defect extended from midline to the posterior part leaving large defect. Due to his medical condition the soft tissues surrounding the defect were not healed and the patient was under medication for the same. The patient had a completely set of dentition in the mandibular arch. A maxillary hollow bulb obturator was planned for this patient.

Prosthodontic Intervention:

After discussing the possible treatment options with the patient, considering his age and medical condition, fabrication of a conventional partial denture prosthesis along with hollow bulb obturator that would restore aesthetics and function, as well as obliteration of the defect, was planned. A maxillary and mandibular preliminary impression was taken with irreversible hydrocolloid (DPI Algitek) using a stock tray, after packing the defect with gauze to prevent impression material from entering the nasal cavity. An impression was poured with dental stone Type IV (Kalabhai) and a custom tray was fabricated using auto polymerizing acrylic resin (DPIRR Cold Cure). Border molding was done with green stick compound, and a secondary impression was made with elastomeric impression material after blocking the defect with gauze. In the master cast, the vestibular and

palatal defect was blocked with wax to relieve undercuts before fabrication of the denture base and occlusal rim. Tentative jaw relation recorded and transferred to a mean value articulator for artificial teeth arrangement. During the wax try-in appointment, the patient's centric relation, esthetics, and phonetics were assessed. It was then processed with heat-cured acrylic denture base material using lost salt technique using cellophane sheet to obtain a hollow bulb obturator. The denture after processing, salt is eliminated and the bulb of the obturator was made hollow to reduce the weight of the prosthesis. During the denture insertion appointment, the patient's occlusion, phonetics, and esthetics were checked, and the patient was asked to drink water to check for nasal regurgitation of fluids.

patient was reviewed after 24 hours and once every two weeks for the next three months.



Figure 1: Intraoral examination

Post-insertion instructions on proper use, care, and maintenance of the prosthesis were given to the patient. The

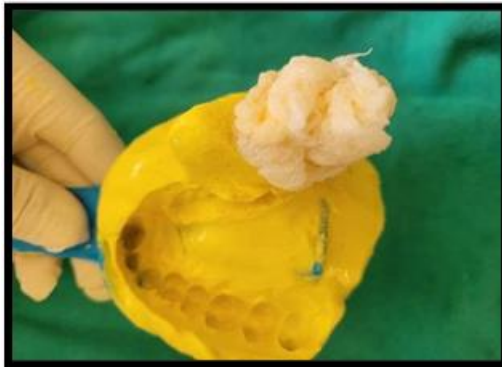


Figure 2: Primary impression and primary cast

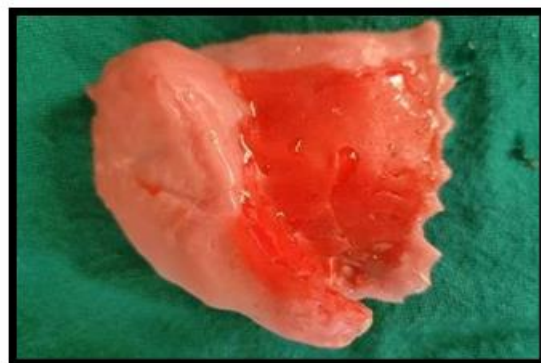


Figure 3: Custom tray with spacer

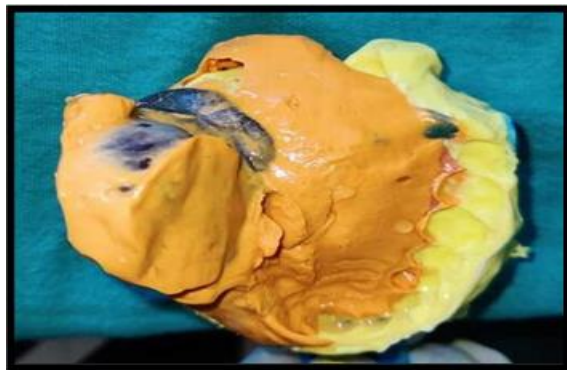


Figure 4: Border molding and secondary impression using elastomeric impression material



Figure 5: Teeth arrangement and flasking

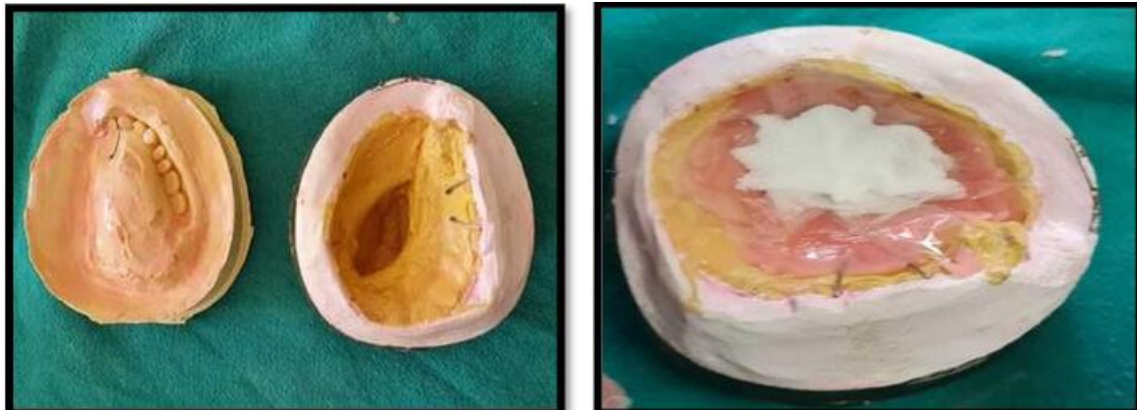


Figure 6: Dewaxing and Packing with salt and cellophane sheet for fabricating hollow bulb obturator



Figure 7: Hollow bulb obturator

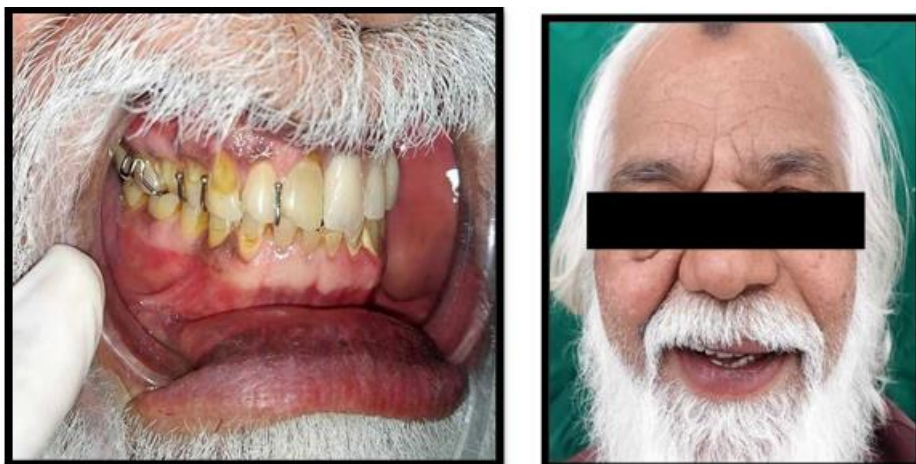


Figure 7: Post insertion

3. Discussion

The COVID outbreak has led to a large outbreak of black fungus disease.¹ When the body's defense system deteriorates, the illness becomes more serious. It has a major impact on those with impaired immune systems. There are several clinical manifestations of the disease, including pulmonary, gastrointestinal, cutaneous, and disseminated.²⁻³ The infections in rhinocerebral mucormycosis go from the sinuses to the brain. Patients undergoing kidney transplants or those with uncontrolled diabetes are known to experience it. The patient in this case study had uncontrolled diabetes, which weakened his immune system and increased the risk of developing mucormycosis. The illness can develop quickly throughout the orbital and midfacial regions, resulting in blindness, palate deformities, maxillectomy, oral-antral fistulas, and related craniofacial abnormalities.⁴⁻⁶ The afflicted individuals' functions are altered and significant scarring results from the postsurgical treatment. Defects range in severity from small intraoral to large midfacial. The main management strategy involves meticulous planning and prosthetic design.⁷ The prosthesis's design changes depending on the kind and extent of the deformity.⁸ The patient's quality of life was enhanced by the use of an obturator, particularly in the areas of phonetics, deglutition, and protecting the tissue for full recovery. The patient's unique aesthetic requirements, the size and kind of the defect, their lifestyle, and their financial situation all play a role in the material and retentive aid selection. The weight of the prosthesis is the main disadvantage of restoring a significant defect, if it is very heavy, retention may be hampered. The purpose of hollow obturators is to solve this issue. It is possible to recommend a variety of procedures and techniques for the manufacture of an open or closed hollow bulb obturator. Since both of these obturators are lightweight prosthesis that the patient can readily accept, they can be used to restore the oral cavity. In this case study, the patient received a hollow bulb obturator in accordance with the extent of the deformity and extra wrought wire clasps were given for additional retention. The main objective was to restore the function and esthetic of the patient without causing much irritation to the mucosa.

4. Conclusion

A sizable portion of the population has either congenital or acquired oral and facial abnormalities. For these individuals, the prosthodontic rehabilitation seemed to improve their quality of life, especially in terms of social interactions and self-worth. The main goal of rehabilitation is to maintain and improve the patient's functional abilities and appearance, which were impacted by their maxillofacial deformity, so they can confidently rejoin society.

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