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Rehabilitation of Post-Mucormycosis Surgical

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Abstract

Mucormycosis is a life-threatening fungal infection that has seen a surge in incidence, particularly following COVID-19, with immunocompromised individuals at highest risk. Surgical debridement often results in maxillary defects that severely impact speech, mastication, and aesthetics. This case report presents the prosthetic rehabilitation of a 59-year-old male with a right-side maxillary defect using a definitive obturator. The obturator successfully restored oral function, improved facial appearance, and enhanced the patient's quality of life. Prosthetic rehabilitation remains a critical component in the comprehensive management of post-mucormycosis maxillary defects.

INTRODUCTION:

Mucormycosis could be a extreme parasitic disease that enters profound into substantial tissue. This "dark organism" picked up noteworthy consideration amid the later surge of COVID-19 cases. It is caused by parasites having a place to the bunch *Mucormycetes* and overwhelmingly influences people with debilitated resistant frameworks. Conditions such as diabetes, cancer, organ transplantation, intemperate press levels, long-term corticosteroid utilize, physical wounds, inveterate neutropenia, and destitute nourishment are common hazard components [1,2]. The disease can show in a few shapes, counting rhinocerebral, rhinomaxillary, pulmonary, gastrointestinal, cutaneous, and systemic sorts. The foremost common course of contamination is through the inward breath of parasitic spores [3].

Treatment for mucormycosis regularly includes a combination of antifungal solutions, surgical evacuation of influenced tissues, and adjustment of basic metabolic conditions [2,4]. Surgical mediation frequently requires total evacuation of the tainted region. The disease can quickly spread to zones such as the midface, possibly driving to genuine complications like palatal apertures, oro-antral communications, maxillary bone expulsion, vision misfortune, and other craniofacial impedances [3,4].

Such anatomical absconds can result in issues like nasal discourse, inadvertent section of liquids into the nasal cavity,and disabled chewing work. In these cases, an obturator prosthesis is frequently utilized to seal the communication between the verbal and nasal cavities [5]. Agreeing to the Glossary of Prosthodontic Terms, an obturator could be a maxillofacial prosthesis planned to shut an obtained or inherent imperfection, essentially including the difficult sense of taste and encompassing delicate or alveolar tissues [7]. The plan and degree of the obturator depends on the estimate and sort of the imperfection, the nature of the encompassing tissue and the utilitarian needs for retention, support and solidness of the prosthesis [6].

Prosthetic rehabilitation could be a pivotal portion of reestablishing work and moving forward the quality of life for patients influenced by such absconds. This article talks about the prosthetic administration of a postsurgical deformity coming about from mucormycosis.

CASE REPORT:

A 59-year-old male patient reported to the Department of Prosthodontics and Crown & Bridge with chief complaints of difficulty in eating food and an unesthetic appearance. He also experienced nasal regurgitation of water and food, along with a noticeable nasal twang during speech. Additionally, he reported a loss of cheek fullness, which contributed to a poor facial appearance. These issues were attributed to a postsurgical defect located on the right side of the palate, significantly affecting both his function and facial esthetics.

PAST MEDICAL HISTORY:

Revealed that patient was known a diabetic and underwent right partial maxillectomy due to post Covid-19 mucormycosis of maxilla 1 year back. Pt is a kown case of diabetic and hypertension and under medication since 12 years.

EXTRA ORAL EXAMINATION:

On clinical examination, the temporomandibular joint (TMJ) was found to be normal, with no signs of pain, clicking, or restricted movement. The patient exhibited a square facial form; however, facial asymmetry was evident due to a noticeable collapse of the right cheek. This asymmetry is likely a consequence of the postsurgical defect, contributing further to the patient's compromised facial aesthetics and functional concerns.

INTRA ORAL EXAMINATION:

Clinical examination revealed a well-healed hard tissue defect in the maxilla involving the right side of the hard palate and alveolar ridge, resulting in both oro-antral and oro-nasal communication. Several teeth were missing, specifically 11, 12, 13, 14, 15, 16, 17, and 21. The alveolar ridge on the affected side was absent, accompanied by obliteration of the labial and buccal vestibules, further complicating prosthetic rehabilitation. Based on the extent and location of the defect, it was categorized as Aramany’s Class I

PROPOSED TREATMENT PLAN:

Rehabilitation with a definitive obturator with a cast metal framework.
Delayed reconstruction of hard and soft tissue followed by implant-supported prosthesis.
Patient was not willing for any surgical intervention so he chose rehabilitation with a definitive obturator with a cast metal framework.

PROCEDURE:

To begin the prosthetic rehabilitation, the palatal defect was gently packed with gauze coated in petroleum jelly to prevent impression material from entering the defect area(fig no-1,2). An initial impression was taken using an irreversible hydrocolloid material with a stock metal tray(fig no 3). This impression was poured using Type III dental stone to obtain a preliminary cast (fig no 4). Once set, the cast was removed and analyzed using a Ney surveyor to determine the optimal path of insertion and to facilitate design planning for the removable partial denture framework.
A digital framework design was developed based on the survey. Embrasure clasps were incorporated on teeth 24 through 27, while an I-bar clasp was designed for tooth 22. To enhance retention, indirect retention was achieved through rest seats on teeth 22 and 23. A mesh-type minor connector was planned

to extend over the palatal defect for improved tissue support, and a full palatal coverage major connector was included to ensure strength and stability of the prosthesis.

To support the framework, rest seat preparations were carried out: mesial occlusal rests were placed on teeth 25 and 27, distal occlusal rests on 24 and 26, and a cingulum rest seat was created on tooth 23. A definitive impression was then made using medium-body polyvinyl siloxane, capturing fine anatomical detail(fig no 5). This was poured in dental stone to produce the master cast.

The defect area was blocked out on the master cast using wax, and the cast was duplicated to fabricate a refractory cast. This refractory model was scanned digitally to finalize the design of the metal framework. The design was 3D printed using castable resin and processed through conventional investing and casting techniques.

Intraoral try-in of the framework was performed to verify its fit, and any occlusal discrepancies were adjusted. An occlusal rim was built up with modeling wax over the edentulous region, and the jaw relation was recorded after softening the rim intraorally. Tooth shade selection was done by comparing with adjacent natural teeth(fig no 6).

To improve adaptation over the defect, the altered cast technique was employed. Functional impressions were taken, and a modified cast was created. The recorded jaw relation was transferred to a mean value articulator, and prosthetic teeth were arranged accordingly. A try-in appointment allowed for the evaluation of esthetics, occlusion, and speech, with adjustments made as needed(fig no 7).

Once the setup was approved, the obturator prosthesis was processed using heat-cured acrylic resin. The final appliance underwent careful finishing and polishing before delivery. The patient received thorough instructions on usage, cleaning, and maintenance of the prosthesis, along with recommendations for follow-up visits to monitor fit and function(fig no 8).

Discussion

The prevalence of mucormycosis, an opportunistic, aggressive fungal infection, has significantly increased, especially in immunocompromised people and COVID-19 patients. The infection frequently results in major maxillofacial abnormalities and demands complex surgical procedures, including maxillectomy. Speech, mastication, deglutition, and facial aesthetics are all negatively impacted by these oro-nasal communication abnormalities, which lowers the patient's quality of life.

In order to restore function and appearance in these patients, prosthodontic rehabilitation is essential. The management of maxillary deformities is well-established and involves the use of a final obturator prosthesis (9). A definitive obturator with a cast metal framework was used in the case study, taking into account the patient's particular requirements, residual dentition, and defect size.

To provide optimal functional load distribution, the design included a whole palate main connector. Clasp placement and the use of soft tissue undercuts were used to achieve retention.

The obturator was selected to reduce dislodging forces during function and improve patient comfort. Additionally, this shape lessens nasal regurgitation during deglutition and promotes improved speech resonance (10).

In order to meet the unique needs of patients with mucormycosis, the rehabilitation process emphasizes the value of a multidisciplinary approach comprising prosthodontists, surgeons, and speech therapists. Long-term success and an enhanced quality of life depend on routine follow-up and patient education regarding prosthesis maintenance.

CONCLUSION:

The use of a definitive obturator plays a vital role in the functional and esthetic rehabilitation of patients with maxillary defects resulting from mucormycosis surgery. In the case of a right-side maxillary arch defect, the obturator restores essential functions such as speech, mastication, and deglutition while also preventing oronasal regurgitation. Moreover, it provides psychological and social benefits by improving facial symmetry and patient confidence. A carefully planned and well-fabricated prosthesis, tailored to the specific defect and patient needs, ensures optimal support, retention, and stability. Long-term success depends on regular follow-up, maintenance, and possible prosthetic modifications as healing progresses or anatomical changes occur.

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Fig no 1 preoperative frontal

Fig no 2 intra oral occlusal view maxilla

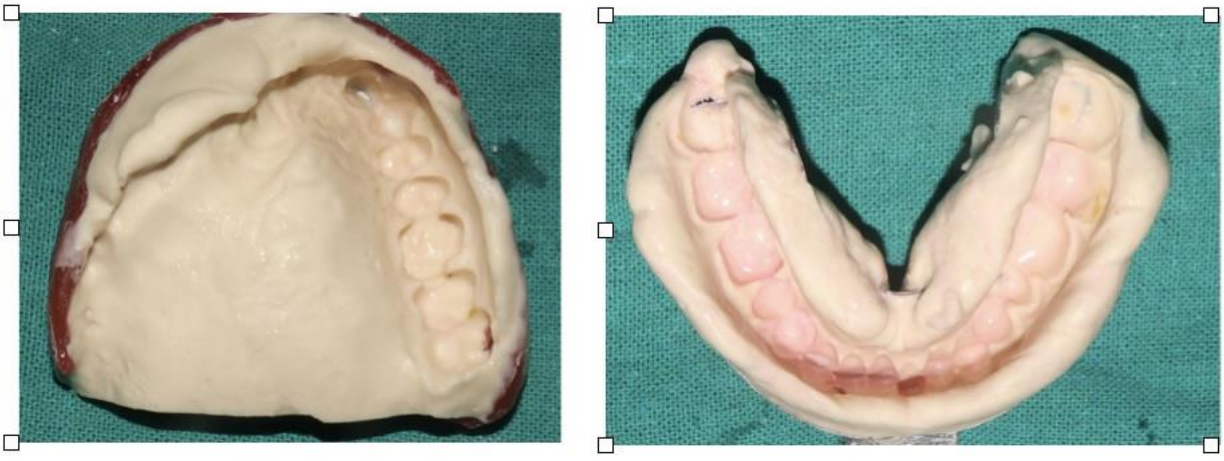

Fig no 3. Primary impression

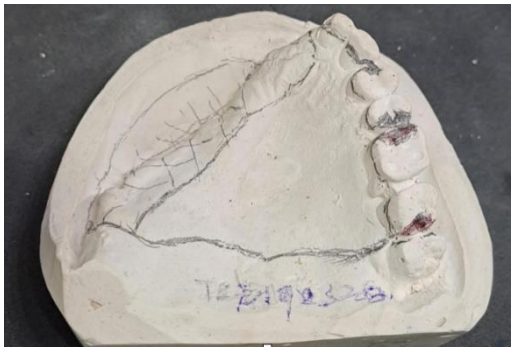

Fig no 4 surveying and designing

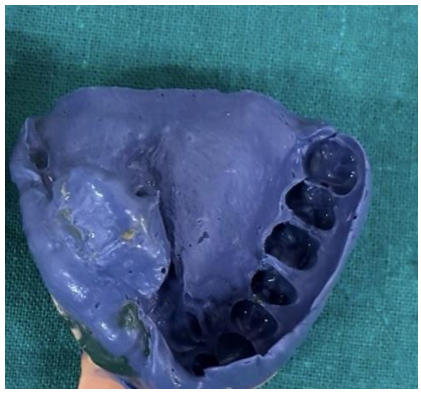

Fig no 5 tooth preparation and impression

Fig no 6 Fabrication of framework and teeth setting

Fig no 7 Tryin done

Fig no 8 Post operative dilvery