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Case Report

Rehabilitation of Maxillary defect using Removable Maxillary Cast Partial Denture Hollow Prosthesis for managing Mucomycosis patient: A Clinical Case Report

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hollow occlusal rim (shim);
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cast partial denture;
maxillary defect

ABSTRACT

Introduction: Mucormycosis is the fungal infection which especially affects immunocompromised patients. **Case Report:** In this case report, prosthetic rehabilitation of maxillary defect due to past mucormycosis in an uncontrolled diabetic patient was discussed by means of lightweight prosthesis by attaching a hollow occlusal shim to cast partial denture framework as absence of alveolar ridge on the defect side tends to increase the weight of the prosthesis which would have compromised the retention of the prosthesis. **Conclusion:** This technique is simple, economical and less time-consuming.

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INTRODUCTION

Mucormycosis is one of the most common fungal infections, which affects maxilla especially in immunocompromised patients.¹ Rhino-cerebral mucormycosis begins in the nose and para nasal sinuses due to inhalation of fungal spores and then spreads to orbital and intracranial structures by direct invasion or through the vascular supply leading to thrombosis and subsequent necrosis of hard and soft tissues.² Such cases often require surgical debridement with total or subtotal maxillectomy. Rehabilitation of maxillectomy defects aims to restore the function of mastication, phonetics, psychological balance and hence improved the quality of life.³

This case report describes the prosthetic rehabilitation of a past mucormycosis, maxillary defect in an uncontrolled diabetic patient by means of cast partial denture framework with hollow occlusal shim.

CASE REPORT

A 35 years male patient with history of diabetes mellitus since 6 years, reported to the Department of Prosthodontics of our institute with the chief complaint of loss of masticatory function and speech. Patient had undergone right endoscopic debridement with inferior partial maxillectomy under general anesthesia 7 months earlier for sino-nasal mucormycosis. Extraoral examination of the patient showed no deformities. (Figure 1a) Intraoral examination revealed well healed Aramany class 2 defect with all teeth present in second quadrant i.e. 21-28. (Figure 1b) Small size of defect opening and presence of teeth in second quadrant did not warrant extension of obturator into the defect for retention. A Cast Partial Denture with hollow occlusal shim to reduce the weight of the prosthesis was planned.

A preliminary impression was made using irreversible hydrocolloid (Zelgan, DENTSPLY) in a perforated stock tray. Final impression was made using irreversible hydrocolloid in an auto-polymerizing acrylic resin (DENTSPLY) custom tray (Figure 2a,b) and poured with Type III dental stone (Kalstone) to obtain the cast.(Figure 2c) A cobalt-chromium metal framework with complete palate type major connector and embrasure clasp assemblies on premolars (24,25) and molars (26,27) for retention was designed, cast and tried in patient's mouth for retention and fit. (Figure 2d) Maxillomandibular relationship was then recorded and transferred to an articulator. (Figure 2e)

After that, putty was used for contouring height and width of hollow shim (Figure 3a) Auto-polymerizing

resin was adapted over putty (Figure 3b) to form hollow shim (Figure 3c). The shim was joined with cast partial denture framework with the help of an auto-polymerizing resin before teeth arrangement. Then teeth arrangement and trial was done. After wax up, flasking, packing and processing were carried out in the conventional manner. (Figure 4a) The prosthesis was inserted and checked for occlusal errors. (Figure 4b,c)



Figure 1. (a) Extraoral photograph (b) Intraoral photograph showing well healed defect

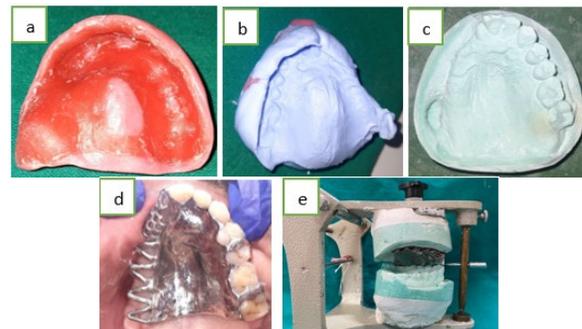


Figure 2. (a) Custom tray (b) Alginate Impression (c) Master Cast (d) Cast Partial Denture Framework (e) Articulation

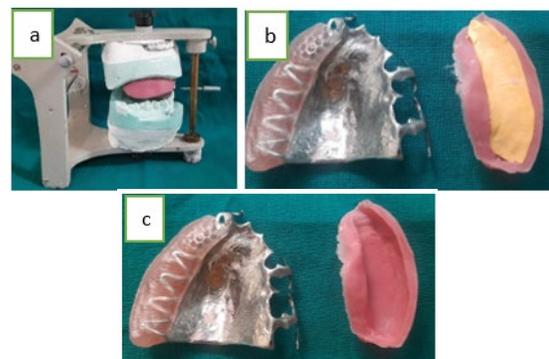


Figure 3. (a) Putty index for occlusal shim fabrication (b) Acrylic adapted over index for occlusal shim fabrication (c) Acrylic shim with or without putty index

DISCUSSION

Mucormycosis is a fungal infection that usually occur in immunocompromised patients, but can infect healthy individuals as well.¹ Patient had uncontrolled diabetes, which is a predisposing factor for mucormycosis because

of impaired host defense mechanism and increased availability of micronutrients such as iron.⁴ The general health of the patient was good and he did not develop ketoacidosis hence the infection didn't disseminate to other organs. Therefore, the patient had a localized rhino-maxillary form of the rhinocerebral mucormycosis. Postsurgical defect predisposed the patient to hyper nasal speech, impaired masticatory function and fluid leakage into the nasal cavity.⁵

In present case, absence of alveolar ridge on the defect side tends to increase the weight of the prosthesis which would have compromised the retention of the prosthesis. Also, the buccal sulcus on the affected side was obliterated so a simple, economical and less time-consuming technique to fabricate a lightweight prosthesis by attaching a hollow occlusal shim to cast partial denture framework was planned as a long-term definitive treatment option for the patient. This prosthesis covered the intra oral defect area and corrected the mastication and speech problems.

Additional silicone Putty was used to contour the height and width of hollow shim over which acrylic resin was adapted in uniform thickness. Thin shim was attached to cast partial denture framework using autopolymerising resin to get a single piece prosthesis which is always superior to a two piece prosthesis.⁶

In this case a complete palate type (major connector) cobalt-chromium metal framework with embrasure clasp assemblies on premolars (24,25) and molars (26,27) for retention was designed. For embrasure clasps, distal marginal ridge of first premolar (24) and first molar (26) and mesial marginal ridge of second premolar (25) and second molar (27) had been prepared to ensure adequate bulk of metal.

Only one processing in heat cured resin as a single unit with predictable internal dimension of the hollow space ensured reduced weight of the prosthesis. Outer heat cure acrylic resin layer over occlusal shim eliminated the micro leakage problem which usually occurs with the use of self-cure acrylic for sealing. The technique was economical and simple to execute and restored patient's function, self-esteem and quality of life.

CONCLUSION

Surgical debridement followed by prosthetic rehabilitation to close the defect and restore the function in the established treatment protocol for mucormycosis patients. A retentive and comfortable prosthesis is important for rehabilitation of such patients. Reduction in

bulk weight of prosthesis in addition to biomechanically planned retention elements of framework are key to success of such prosthesis.

DECLARATION OF PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent forms

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Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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