

# Prosthetic Rehabilitation of a Patient with Maxillary and Mandibular Intraoral Defects Due to Mucormycosis

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## Abstract

Inborn or acquired abnormalities of the palate and contiguous structures need special prosthesis for proper intra oral rehabilitation. The Glossary of Prosthodontic Terms defines obturator as “a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures” This article presents a simplified technique for fabrication of dentures in anatomically compromised arches, wherein a hollow maxillary denture with obturator and an internally weighted mandibular partial denture is given using a cast metal insert in a processed denture base.

**Keywords:** Hollow Denture, Obturator, Internally weighted dentures, Resorbed ridge

## INTRODUCTION

Inborn or acquired abnormalities of the palate and contiguous structures need special prosthesis for proper intra oral rehabilitation<sup>1</sup>. The Glossary of Prosthodontic Terms defines obturator as “a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures”<sup>2</sup>. On the basis of extent of involvement of the defects, these prosthesis may differ in shape and size. Hence a number of hollowing techniques intend to provide a light weight prosthesis that is readily accepted by the patient as the size of the prosthesis increases it leads to added weight to the same. These difficulties lead to abnormal functional occlusion and unacceptable oroantral or oronasal seal<sup>5</sup>.

Severe resorption of the mandibular alveolar ridge leads to instability and discomfort of the conventional acrylic resin denture. Grunewald introduced gold as the metal of choice for the resorbed mandibular residual ridge. He compared the weight of the average gold base with the weight of the teeth and bone lost through extraction and extensive resorption and suggested a gold base of approximately 16dwt (25g) dwt [Dead weight tonnage]. [20dwt = 31.104gms] for the average-sized mandible<sup>14</sup>. Utilizing a cast lower denture base and sufficient base extension will help to address these shortcomings.

This article presents a simplified technique for fabrication of dentures in anatomically compromised arches, wherein a hollow maxillary denture with obturator and an internally weighted mandibular partial denture is given using a cast metal insert in a processed denture base

## CASE REPORT

A 52-year-old male patient visited Department of Prosthodontics, People's Dental Academy, Bhopal with the chief complaint of difficulty in chewing, nasal regurgitation of fluids, compromised esthetics, disharmony, and difficulty in speech with nasal twang in his voice. Patient provided with a history of post covid-19 mucormycosis infection and surgical removal of the tissue.

Extra oral examination revealed gross facial asymmetry with depressed left malar region (Figure 1). On intraoral examination an oroantral defect on the left side of maxillary arch involving part of left buccal vestibule with all the maxillary teeth missing was observed (Figure 2) and left hemialveolotomy (Figure 4) of mandible with the hard and taught labial and buccal tissue on the same side was observed (Figure 3). A hollow denture with obturator in maxillary arch was planned, since the weight of the obturator leads to loss of retention and discomfort for the patient and as the mandibular ridge was highly resorbed an internally weighted mandibular partial denture was planned for the prosthetic rehabilitation of this patient.



Figure 1: Extra oral examination



Figure 2: Intraoral examination of defect area



Figure 3: Intraoral examination of mandible

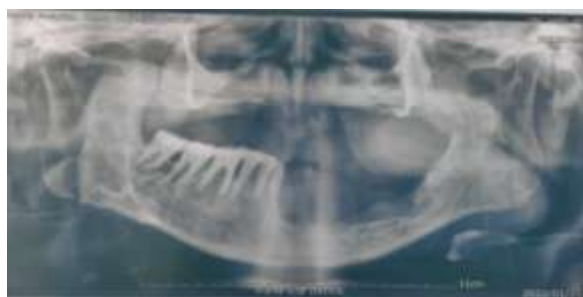


Figure 4: Orthopantomogram of patient

#### PROCEDURE

A preliminary impression of upper and lower arch was made using irreversible hydro-colloid (Zelgan 2002 dust-free easy mixing, DENTSPLY India Pvt. Ltd., Haryana). The custom tray was fabricated using auto polymerizing acrylicres in (self-cure acrylic repair material, DENTSPLY India Pvt. Ltd., India), and border molding was carried out using green stick impression compound (DPI Pinnacle, tracing stick, Dental Products of India, Mumbai). Final impression was made with light viscosity addition silicone impression material (Reprosil, DENTSPLY Caulk, USA) as shown in (Figure 5) and the master cast was fabricated using die stone (Kalstone, Kalabhai Karson Pvt. Ltd., India). The undesirable undercuts present in the defect were blocked out by wax.

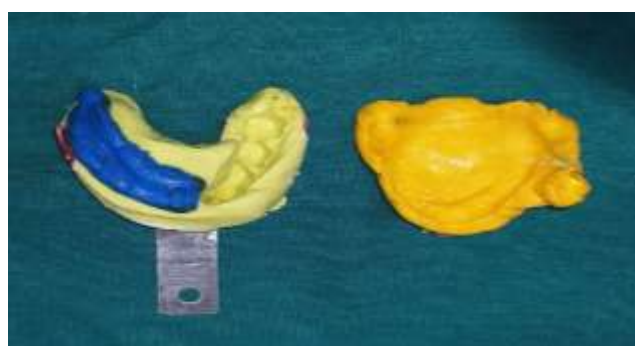


Figure 5- Final impression of maxillary and mandibular arch

To fabricate the casting metal alloy piece the mandibular cast was blocked out with pattern wax and duplicated in agar-agar material. Investment material was poured to get the refractory cast. Casting was done to get the piece of metal which will be inserted into the mandibular denture while curing. Using heat polymerizing acrylic resin, a denture record base was prepared incorporating the previously made metal piece and wax occlusal rim was made over it. Orientation jaw relation was then recorded and transferred to

semi adjustable articulator and was mounted in centric relation. Selection and arrangement of teeth were done and try-in was performed on the patient. The mandibular denture was packed with the casted metal piece in it and cured.

A 1.5mm thick soft thermoplastic sheet was adapted to maxillary teeth arrangement which was checked in the patient's mouth while try-in as a reference guide, and a wax block was made in this and refrigerated for few hours to make the maxillary denture hollow. Flasking and dewaxing procedures were carried out. During the packing procedure of maxillary denture the defect area was first loaded and packed with heat polymerizing acrylic resin with a thin plastic sheet in between the counter parts of flask. At the time of trial closure, the previously fabricated wax block was placed and cross checked with the thermoplastic guide (Figure 6), finally the whole area was loaded with heat polymerizing acrylic resin and curing was done. After the fabrication of the maxillary denture, a hole was made to eliminate the wax and later the hole was packed with self polymerizing acrylic resin, followed by finishing and polishing, and the procedures were carried out in a conventional manner (Figure 7 and 8).



Figure 6- Correct placement of wax



Figure 7- Maxillary denture with obturator



Figure 8- Hollow maxillary denture

Since the ridge was resorbed, the maxillary denture was lined by chairside permanent soft liner( mollosil relining material, detaxgermany) so as to incorporate the undercuts for the retention without harming the underlining sensitive tissue. first the adhesive was applied then the soft silicone material was applied to the intaglio surface of denture and placed in patient's mouth as per instruction given with product. after polishing and finishing the varnish is applied with the painting brush (Figure 9).



Figure 9- Permanent soft liner

Finally, the obturator prosthesis was inserted in the patient mouth (Figure 10). Patient was happy and satisfied with his improved function, speech, and esthetics.



Figure 10- Post-op front profile of the patient



Figure 11- Maxillary denture intra oral view





Figure 12- Mandibular partial denture intra oral view

## DISCUSSION

Nevertheless, it has been demonstrated that making an obturator lighter is advantageous when restoring a significant maxillofacial deformity. Given the extensive volume of the denture base material in prostheses provided to patients with large maxillofacial defects or severe residual ridge resorption, reduction in prosthesis weight may be achieved by making the denture base hollow.

The technique described in this article for the fabrication of the hollow bulb obturator was described by Janakirama Reddy Sridevi et al<sup>16</sup>. However, there are several methods available in the literature for the fabrication of the hollow bulb obturator. Matalon and LaFuente described the technique of adding sugar during processing of the obturator, which is later removed by drilling a hole in the superior surface and the hole is filled with autopolymerizing resin<sup>15</sup>. The opening can also be filled by using a non detachable screw cap. Fattore et al. used a variation of a double flask technique for obturator fabrication by adding heat polymerizing acrylic resin over the definitive cast and processing a minimal thickness of acrylic resin around the teeth using a different drag. Both portions of resin were then attached using heat-polymerized resin<sup>16</sup>.

## CONCLUSION

Patients with large maxillectomy defects present a significant challenge for prosthetic rehabilitation. These patients' retention is substantially affected, which causes problems with speech and mastication.

Hollow maxillary complete denture considerably reduces the weight of the prosthesis which in turn prevents transmission of detrimental forces which would otherwise be transmitted from a conventional heavy prosthesis to the underlying tissues. Thus it helps to preserve underlying tissues and bone.

An ideal treatment option in situations of significantly resorbed anterior mandibular ridge is to reinforce the denture with a specially designed metal framework that is well suited to the ridge. This reinforcement will aid in resisting fracture of the resulting denture

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