



CASE REPORT

MANAGEMENT OF SEVERELY RESORBED MAXILLARY RIDGE WITH A MODIFIED LIGHT-WEIGHT HOLLOW COMPLETE DENTURE AND MONOPLANE TEETH: - A CASE REPORT

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ABSTRACT

Retention, stability and support are the basic principles on which the success of a complete denture relies on. The skill lies in applying these principles efficiently in critical situations. Extreme resorption in one or both of the residual alveolar ridges accompanied by resilient maxillary denture bearing tissues in the edentulous patient presents a difficult restorative problem and may lead to problems with prosthetic rehabilitation. This article highlights on a technique for the fabrication of a maxillary denture with a part of it made hollow in a situation where there is excessive resorption in a part of maxillary residual alveolar ridge due to the constant impingement of the opposing teeth in that area. Vinyl-polysiloxane putty material is used in this technique as a spacer to create the hollow cavity inside the maxillary denture. This technique greatly reduces the weight of maxillary denture and thus ultimately results in increased retention and stability of the denture.

INTRODUCTION

Dentures are designed to replace missing teeth, and are worn by the patient for considerable period of time. Extreme resorption in one or both of the residual alveolar ridges presents difficulty with prosthetic rehabilitation due to a narrower, more constricted residual ridge, and a resultant large restorative space between ridges. Although not universally accepted, (Ohkubo and Hosoi, 1999) it has been suggested that gravity and the addition of weight to the mandibular complete denture may aid in prosthesis retention. (Jacobson and Krol, 1983 and Wormley and Brunton, 1974) & reducing the weight of a maxillary prosthesis, has been shown to be beneficial (el Mahdy, 1969). Historically, various weight reduction approaches have been achieved using a solid 3-dimensional spacer, including dental stone, (el Mahdy, 1969; Worley and Kniejski, 1983; Holt, 1981; Jhanji and Stevens, 1991; Elliott, 1983; DaBreo, 1990 and Fattore *et al.*, 1988) cellophane wrapped asbestos,⁵ silicone putty, (Holt, 1981; Jhanji and Stevens, 1991) or modelling clay (Elliott, 1983; DaBreo, 1990) during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis. Holt (Elliott, 1983) used a spacer which was later removed and the 2 halves luted with autopolymerized acrylic resin. But there

was increased risk of seepage of fluids at the junction. Fattore *et al.* (1988) 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. This case report describes management of severely resorbed maxillary ridge with a modified light-weight hollow complete denture.

CASE REPORT

A 76 year old male patient reported to the outpatient department of Prosthodontics and Crown & Bridge, PGIDS, Rohtak with the chief complaint of replacing missing teeth (Figure 1). After a thorough history taking and clinical examination it was found that 45 and 46 were present and patient had been using 45 and 46 for mastication since almost 6 years because of which there was excessive residual ridge resorption of maxillary ridge in area opposite these teeth (Figure 2). On clinical and radiographic examination (Figure 3) it was found that 45 and 46 had severe bone loss and thus were not sound enough to be retained and hence, it was decided to extract these teeth followed by fabrication of complete denture. The treatment options considered were implant-supported complete denture, conventional complete denture and maxillary complete denture with hollow cavity and conventional mandibular complete denture. After careful

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analysis of each available option, it was decided to fabricate a maxillary complete denture with hollow cavity corresponding to the severely resorbed area and conventional mandibular complete denture. The patient also approved of the treatment modality as it was light in weight, inexpensive and non-surgical procedure.



Figure 1. Pre-operative; 1(A) Front view; 1(B) Profile views



Figure 2. Pre-operative (Intra-oral views)

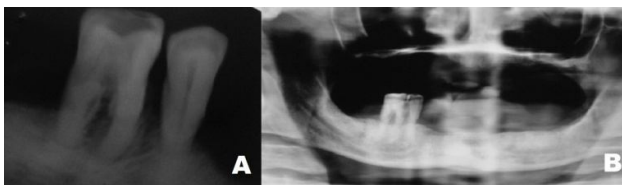


Figure 3. Pre-operative; 3(A) IOPA; 3(B) OPG

PROCEDURE

1. Primary and secondary impressions were made using the conventional techniques (Figure 4), and permanent denture bases were fabricated in heat-cure acrylic resin [Figure 5(A)]
2. Vinyl polysiloxane putty material was placed in the severely resorbed region of maxillary permanent denture base as a spacer to create the hollow cavity [Figure 5(B)].

3. Wax occlusal rims were fabricated and jaw relations were recorded following the conventional technique [Figure 6(A)].
4. Teeth arrangement was done using the monoplane teeth as monoplane teeth are indicated for excessively resorbed ridges, followed by wax-try-in in patient's mouth [Figure 6(B)].
5. Then a window was created on the buccal surface of the maxillary trial denture corresponding to the severely resorbed region by removing wax deep enough to expose the putty, to facilitate removal of putty at later stage [Figure 7(A)] and Aluminium foil was adapted as a separating medium [Figure 7(B)] and a wax lid was prepared for the window [Figure 8(A)] and a wax handle was attached to it for easy handling [Figure 8(B)].
6. The dentures and the lid were then processed separately in heat-cure acrylic resin (Figure 9).
7. After processing of dentures and lid, the Vinyl polysiloxane putty material was removed through the window using a lecron carver and hence a hollow cavity was created in the maxillary denture corresponding to the severely resorbed region (Figure 10).
8. The lid was then attached with cold-cure acrylic resin and the handle was cut-off and dentures finished and polished in conventional manner [Figure 11(A)].

Thus, a modified hollow maxillary denture was fabricated to reduce the weight of denture. (Figure 11(B), 11(C))



Figure 4(A) Primary impression; 4(B) Final impressions

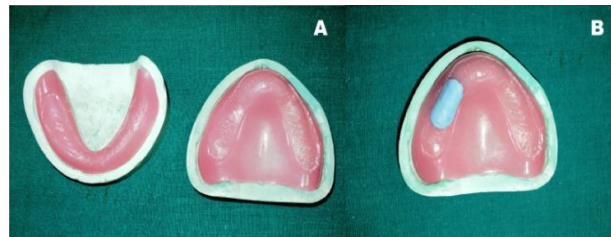


Figure 5(A) Permanent denture bases; 5(B) Vinyl polysiloxane putty material placed at severely resorbed region



Figure 6(A) Recording jaw relations; 6(B) Wax try-in

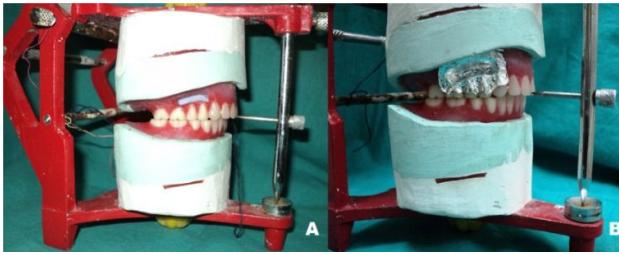


Figure 7(A) Wax removed in severely resorbed region in trial denture; 7(B) Aluminium foil adapted

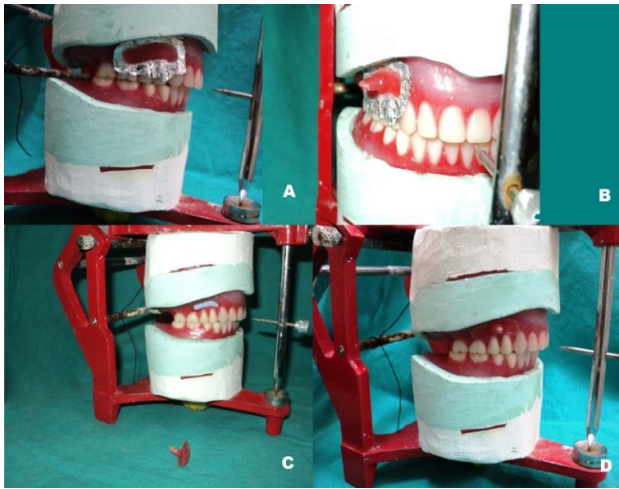


Figure 8(A) Wax lid prepared, 8(B) Handle attached to lid; 8(C) Window and lid; 8(D) Lid placed in window



Figure 9. Acrylization done separately for lid and denture



Figure 10(A) Denture with putty in place after acrylization; 10(B) Putty removed from aperture; 10(C) Hollow cavity in denture



Figure 11(A) Lid attached to denture and finished; 11(B) Post-operative front view; 11(C) Post-operative profile view

DISCUSSION

Rehabilitation of patient with severely resorbed ridges is a challenge to the dentist. Even though, the choice for rehabilitation can be implant supported over denture but many a times the patient come with such a problem are geriatric patients with systemic illness, economic constrains, possess reluctance for a long duration treatment procedure and unwillingness for any kind of surgical procedure. Hence, the best way is to rehabilitate them with conventional complete dentures modified to reduce the weight. The advantages of hollow denture are reduction in the excessive weight of the acrylic resin, which normally replaces lost alveolar ridge in the interridge space of the denture wearer, resulting in the lighter prosthesis making the patient more comfortable. The method described has advantages over previously described techniques for hollow denture fabrication. The small window on the cameo surface facilitates recovery of the spacer in an area that is not commonly adjusted after denture insertion and has a small margin along which leakage could occur. Advantages of using silicone putty as a spacer include its stability, its ability to be carved, and the fact that it does not adhere to acrylic resin and it can be stabilized by use of tray adhesive that can be easily separated later.

SUMMARY

In this case report, patient reported with severely resorbed maxillary ridge due to constant impingement of opposing teeth, and hence a light-weight hollow denture with monoplane teeth arrangement was fabricated to manage the same. Hollow maxillary has a dual action of reducing the weight of the denture as well as reducing the leverage action of the same. This ultimately results in increased retention and stability and to some extent it is also possible to preserve the existing residual alveolar ridge.

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