

Case Report

An Alternative Treatment for Severely Resorbed Mandibular Ridge, Hollow Denture- A Clinical Report

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Abstract:

This article presents a case report for the treatment of severely resorbed mandibular ridge with hollow denture. It also presents the rationale behind the treatment that is reducing resorption by reducing weight of the denture by double flask technique for hollowing the denture with the objective of its use in cases where implants cannot be a realistic option.

Key words: Hollow denture, Resorbed ridges, Rehabilitation

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Introduction

one of the main challenges for Prosthodontic rehabilitation is severe atrophy of residual ridges. Conventional restoration of the severely atrophied mandibular residual alveolar ridge has sparked a number of different designs to accommodate patients who have difficulty wearing a mandibular denture. For more than 150 years, it was believed that the weight of the denture contributes to both the retention and stability of mandibular complete dentures. A number of clinicians still recommend 'weighted' mandibular dentures for the management of severely resorbed ridges.^{1,3} However, studies have shown that denture stability can be obtained without the addition of extra weight to the denture by improving the fit of the denture base.^{2,4} Ohkubo and Hosoi⁵ concluded from their study that the weight of a mandibular denture may not affect its retention or stability. Some criticism also arose that extra weight may in fact cause accelerated resorption of the residual ridges.^{6,10} Given the extensive volume of the denture base

material in prostheses provided to patients with severe residual ridge resorption, reduction in prosthesis weight may be achieved by making the denture base hollow.

The following case describes the laboratory technique where a hollow complete lower denture was provided for a patient with severe ridge resorption.

Case Report

A 84 year- old male patient reported with a ill-fitting lower denture. The patient gave a history of being a denture wearer for the past 20 years. His dentures were replaced thrice. There was no relevant Medical history means that there was no underlying systemic disorder. Intraoral examination revealed a severely resorbed lower ridge with prominent genial tubercles. [Figure 1] The patient was assessed with a view of providing him with an implant retained complete lower denture in order to minimize the rate of resorption. But because of age considerations and

unwillingness of patient for surgical procedures an alternative was planned, and that was a hollow complete lower denture.

Clinical procedures

Conventional clinical steps of primary impressions and final impressions were done. After final casts were made, processed record base was made on lower cast. The upper record base was made with self cure acrylic resin. Maxillo-mandibular relations were recorded and were transferred to the articulator. After trial insertion, the waxed denture was invested.

Laboratory procedure

Two split dental flasks with interchangeable top halves [Figure 2] were used to construct the hollow denture. A processed record base was made on the definitive cast by following conventional laboratory procedures. After trial insertion, the waxed mandibular denture was invested in the first flask with dental plaster, the wax was boiled out the two halves of the flask were separated [Figure 3]. A wax shim consisting of two layers of base plate wax was then applied over the denture teeth area of the flask [Figure 4] ensuring that the lid of the flask containing the invested definitive cast and the processed record base closed completely with the wax shim in place. The wax shim was thinned down in areas of interferences. The processed record base in the top half of the flask was set aside to be used later in the procedure.

The bottom half of the first flask containing the denture teeth with the wax shim in place was then topped and flaked using the lid of the second flask, the wax shim boiled out, separating media (Cold-mold seal, DPI Products, Mumbai, India) was applied and heat polymerized acrylic resin was packed and processed as usual [Figure 5]. This resulted in two halves i.e., the processed record base and the half containing the denture teeth, which had to be then fused together. Notches were made along the borders of the two halves to be fuse. Any excess acrylic resin on the inner surface of

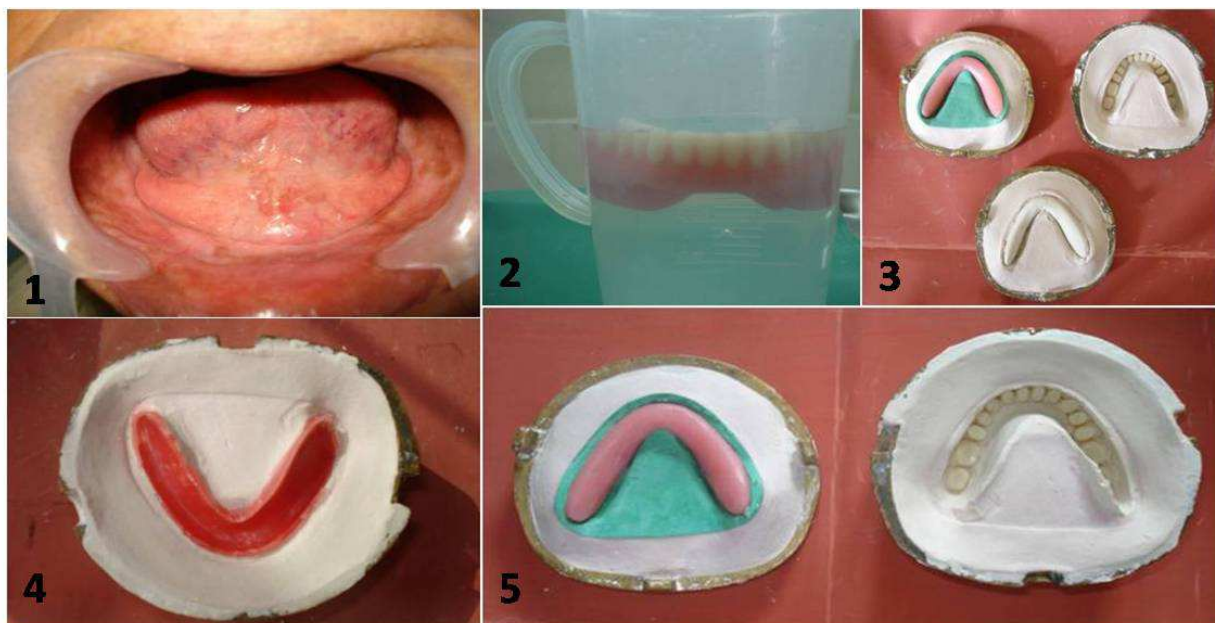
the half containing the denture teeth that would constrict the hollow cavity was reduced.

The two parts were then fused with auto polymerizing resin [Rapid Repair, Pyrax Polymers, Roorkee, India during the lab remounting stage (for proper orientation of the two parts) and then tested for a complete seal by placing it in water. The denture floated ensuring a complete seal. The denture was then finished and inserted [Figure 6]. On review the patient was very satisfied with the function and comfort of the denture.

Discussion

A severely atrophic mandible poses a clinical challenge for the fabrication of successful complete denture prosthesis. This may be due to a narrower, more constricted residual ridge; decreased supporting tissues and a resultant large restorative inter ridge space. The latter may result in a heavy mandibular complete denture. Although a number of clinicians recommend 'weighted' mandibular dentures for severely resorbed lower ridges, studies^{1,3} have shown that weight may not contribute to the retention and stability of a lower denture. Extra weight may infact cause accelerated resorption of the residual ridge.^{6,7} This may be due to the continuous pressure exerted on the residual ridge by the heavy denture even at rest.^{8,9,10}

In order to avoid this problem the case reported was treated with a hollow mandibular complete denture, which resulted in approximately 25% of reduction in the weight of the denture in comparison with the conventional denture. This may be applicable to situations where there is severe atrophy of the residual alveolar ridges and placement of implants is not a realistic option. The technique described in this article is modified from a technique described by Holt¹¹ and has several advantages over the previously described techniques in literature¹²⁻²⁶ [Table]. It is a simple, economical, time saving procedure that eliminates the need for a spacer for



creating the hollow cavity, allows control of the thickness of the acrylic resin occupying the hollow portion. Also, fusing the sections with autopolymerizing resin minimizes processing errors that would occur with heat cure acrylic resin. However, the technique has its limitations. The junction between the two halves of the denture is fused with auto polymerizing resin, which poses a risk of microleakage and discoloration over a period of time.

Summary

A technique for fabricating a hollow complete mandibular denture is described with the objective of emphasizing the need to preserve the remaining alveolar bone by the use of a hollow denture in situations where there is excessive resorption of the residual alveolar ridge and implant treatment is not a realistic option. The advantage of a hollow denture for severely resorbed lower residual alveolar ridges is the reduction in the excessive weight of the acrylic resin that may load the residual alveolar ridge. The technique described in this article eliminates the need for a spacer and also controls the thickness of acrylic resin occupying the hollow portion, which results in a lighter prosthesis.



Figure 6: Final Inserted Denture

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