

Hollow Maxillary Denture: Lost Salt Technique

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ABSTRACT

Background: Denture esthetics provide confidence and improves social interaction of the patient. Basic principles like retention, support and stability enhance comfort and adaptability of the denture wearer. Severely resorbed ridges with increased inter-arch distance result in the fabrication of bulky complete dentures which further leads to compromised denture retention. Bulky dentures are also likely to cause constant pressure on the bone. This article highlights a case report of an edentulous patient with resorbed ridges, where a simplified technique for fabricating a hollow maxillary complete denture using the lost salt technique was used for preservation of denture bearing areas. The hollowing of the denture reduces the weight of the denture, thereby enhancing stability & retention and up to some extent, it also preserves the existing residual alveolar ridge.

Keywords: Hollow maxillary complete denture, inter-arch distance, severely resorbed ridge.

INTRODUCTION

Prosthetic rehabilitation of severely atrophic ridges has always been an ordeal for the clinician due to decreased support, stability and retention. Because of severe resorption, the inter-ridge distance between maxillary and mandibular ridges is increased. Rehabilitation in such cases may result in increased weight of the prosthesis. This, in turn, overloads the underlying hard and soft tissues exacerbating ridge resorption so, in order to break this vicious cycle, the weight of the prosthesis needs to be reduced which can be achieved by making the hollow prosthesis. Thus, decreasing the weight of a maxillary prosthesis has been shown to be beneficial when fabricating a maxillary complete denture for the restoration of a sizeable maxillofacial defect.^(1,2) It has also been proved that prosthesis weight can be reduced by making denture base hollow.

Various approaches for weight reduction have been achieved by using a solid three-dimensional spacer, including dental stone,⁽³⁾ cellophane-wrapped asbestos,⁽⁴⁾ silicone putty⁽⁵⁾ or modelling clay⁽⁶⁾ during laboratory processing to exclude

denture base material from the planned, hollow cavity of the prosthesis. Holt et al. processed a shim of indexed acrylic resin and used auto polymerized acrylic resin to lute the two parts together.⁷ Fattore et al. used a variation of the double flask technique for obturator fabrication.⁸ O'Sullivan et al. described a modified method using a definite matrix of the trial denture base and silicone putty as a spacer which was later retrieved through holes.⁹

In this case report, a 58-year-old edentulous male patient with severely resorbed ridges and increased inter-ridge distance was treated with a hollow maxillary denture, using lost salt technique combined with neutral zone concept to improve the retention and stability of dentures.

CASE REPORT

A 58-year-old male patient reported to the Department of Prosthodontics, with a chief complaint of looseness of both upper and lower dentures and desired the replacement of the same. Medical history revealed that the patient was on oral hypoglycemic agents. Past dental history

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revealed that patient was a denture wearer since 7 to 8 years. The intraoral examination revealed severely resorbed maxillary and mandibular edentulous ridges with increased inter-ridge distance (Figure 1).



Figure 1: Intraoral view of the maxillary and mandibular arch

Various treatment options available for the patient were :

- a) Conventional Complete denture
- b) Implant-supported complete denture
- c) Hollow maxillary complete denture and a conventional mandibular complete denture

Considering the economic constraints, available inter arch space and retention factor, treatment plan decided for the patient was the third option.

TECHNIQUE:

1. Preliminary impressions of the edentulous maxilla and mandible were made with a viscous mixture of 3 parts impression compound + 7 parts greenstick compound followed by border molding performed with the green stick and final impression with zinc oxide eugenol impression paste.
2. Compound occlusal rims were fabricated as per McCord's technique for making a neutral zone record by having the patient perform various orofacial movements. The maxilla-mandibular relationship was recorded using compound occlusal rims and transferred to the articulator, and artificial teeth were arranged.
3. After the try-in procedure, the wax-up of trial dentures were done and made ready for processing (Figure-2a, 2b). The mandibular denture was processed using the conventional method.



Figure-2a: Maxillary wax-up trial denture Figure-2b: Invested maxillary denture

Steps for the Fabrication of Hollow Maxillary Complete Denture :

4. The maxillary trial denture was flaked and dewaxed in the conventional manner (Figure-3).



Fig 3: Dewaxed mould

5. Half of the heat cure PMMA in dough stage was positioned accurately over the dewaxed mould and then salt crystals were placed over it (Figure-4).



Fig 4: Salt crystals placed over the first layer of dough

6. Above that, the remaining heat cure resin was packed and cured at 74 degrees C for 7-8 hours (Figure-5). The cured denture was retrieved and holes were made in the palatal area.



Fig 5: Second layer of dough placed over the salt crystals

7. All the residual salt crystals were removed by flushing water with the high-pressure syringe through the holes. After making sure that all the salt crystals have been removed, the escape holes were closed with auto polymerizing resin.
8. Verification of the sealed cavity was done by immersing the denture in water. If no bubbles are evident, an adequate seal is confirmed (Figure-6).



Fig 6 : Floating hollow maxillary denture

9. The denture was inserted and instructions regarding the handling of the denture were given to the patient as the dentures are prone to fracture (Figure-7).



Fig 7: Post-operative view

DISCUSSION

Despite better available treatment modalities like implant-supported overdenture for a patient with severely resorbed ridges; conventional complete denture continues to be a better choice of rehabilitation due to economic constraints, systemic conditions, unwillingness for an invasive surgical procedure, reluctance for a lengthy treatment procedure etc. Hollow maxillary complete denture considerably reduces the weight of the prosthesis, which in turn prevents transmission of the detrimental forces, which would otherwise be transmitted from a conventional heavy prosthesis to the underlying tissue and bone. Thus, it helps to preserve underlying muscle and bone.

The method described has advantages over the previously described techniques. The salt crystals being heat-labile melt during the curing procedure and thorough flushing after curing results in no crystals remaining in the denture thereby maintaining the integrity of the denture, avoiding the tedious effort to remove the spacer material from the denture. This lost salt technique is simple to execute and utilizes a very cheap and readily available spacer material. Thus the primary goal of establishing of function, comfort and esthetics is accomplished.

CONCLUSION

Hollowing of maxillary denture thus prevents residual ridge resorption, compensates and improves the retention lost due to virtue of its heavy weight. A simplified technique for fabricating light weight maxillary denture using salt crystals as spacer was found to be effective and satisfactory for the patient. The advantage of this technique is reduction in excessive weight of the acrylic resin, resulting in the lighter prosthesis thereby making the patient comfortable.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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