

An Alternative Approach for Fabrication of a Hollow Maxillary Complete Denture: A Case Report

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Abstract : The fabrication of a successful maxillary complete denture in severely atrophic maxillary ridges with large inter ridge distance is always a clinical challenge. In such clinical conditions weight of the maxillary complete denture often becomes a dislodging factor , thereby increasing the need for fabrication of a light weight maxillary denture for better retention. This clinical report describes an alternative approach for fabrication of a hollow maxillary complete denture in a patient with resorbed maxillary and mandibular ridges with increased inter ridge distance.

Keywords: Residual ridge resorption , Inter ridge distance , Hollow maxillary denture , Light weight denture.

I. Introduction

Extreme resorption of maxillary ridges always poses a clinical challenge for the fabrication of a successful maxillary complete denture. Severely atrophic maxillary ridge coupled with increased inter ridge distance, often results in a heavy maxillary complete denture with compromised retention. Studies suggest that gravity and addition of weight to mandibular complete dentures improves retention , though it was not universally accepted^{1,2,3}. Similarly it has also been proved that reducing the weight of the maxillary complete dentures often provides better retention, especially in patients with severely resorbed maxillary ridges^{4,5}. Weight of the prosthesis is usually reduced by hollowing the denture base. Solid three dimensional spacers like cellophane wrapped asbestos⁶, modelling clay , silicone putty^{7,8} , or dental stone⁹⁻¹³ have been used to exclude denture base material from planned hollow denture cavity. This clinical report describes an alternative approach for fabrication of a hollow maxillary complete denture in a patient with resorbed maxillary and mandibular ridges with increased inter ridge distance , using silicone putty and pumice-dental plaster mixture (1:1 by weight) for hollowing of maxillary denture base.

II. Case Report

A 70 year old male patient reported to the department of Prosthodontics with the chief complaint of loose upper and lower denture and difficulty in chewing (Fig.1). Patient's history revealed that he was a denture wearer for the past 10 years. Clinical examination revealed severely atrophic maxillary ridge along with increased inter ridge distance and long lip (Fig.2). Patient did not have any relevant medical history. Final treatment plan was to fabricate a new set of complete denture in which maxillary denture is hollow .

Procedure:

1. A definitive impression of the maxillary and mandibular ridges were made and the denture was fabricated up to the try in stage in a conventional manner (Fig.3).
2. Standard procedure of the maxillary denture fabrication was then done up to the wax elimination stage.
3. A thin layer of modelling wax was adapted to the intaglio surface of the teeth , conforming to the border extensions (Fig.4). Original cope was then reseated on the drag and complete closure of the flask was confirmed. Another flask was then used to invest the modelling wax and the second drag was packed with heat-polymerized acrylic resin and processed. Finally a thin shim of indexed acrylic resin was made over the residual ridge.
4. Poly vinylsiloxane putty material was then mixed and adapted over the permanent denture base and the counterpart with acrylic shim was seated over it.
5. Set vinyl polysiloxane putty material was then removed from the area of the residual alveolar ridge(Fig.5) and pumice dental plaster mixture was then poured onto the acrylic shim area. Then the flask was closed and waited for the mixture to set(Fig.6).
6. Then the flask was reopened and the remaining putty material was removed from the borders and cameo surface of the permanent denture base(Fig.7).

7. A thin mix of heat polymerized acrylic resin was then injected onto the sides of the acrylic shim , thereby covering the borders of the set pumice-dental plaster mixture. Then the counterpart with the permanent denture base was then seated over the acrylic shim portion and processed.
8. Deflasking was done in the usual manner and the laboratory remount was done on the semi adjustable articulator for occlusal adjustments. Two windows were then made using bur into the permanent denture base just distal to the most posterior teeth. Pumice- dental plaster mixture was then removed by scraping with a sharp instrument. After complete removal of the mixture windows were sealed using auto polymerizing resin(Fig.8).
9. Final finishing and polishing of the denture was done(Fig.9) followed by immersing it in water to ensure complete sealing of the hollow cavity(Fig.10).
10. Regular recall visits were then made every 3 months during which no discomfort was reported by the patient and the patient was quite satisfied with function , aesthetics and comfort of the denture(Fig.11).

III. Figures and Tables



Fig.1 : Pre operative frontal view



Fig.2: Atrophic maxillary and mandibular ridges



Fig.3: Trial denture in semi adjustable articulator



Fig.4: Modeling wax adapted to the intaglio surface of the teeth for making acrylic shim



Fig.5 : Set vinyl polysiloxane putty material removed from the area of the residual alveolar ridge



Fig.6 : Set pumice dental plaster mixture over the acrylic shim area



Fig.7 : Remaining putty material removed from the borders and cameo surface of the permanent denture base.



Fig.8 : Windows sealed using auto polymerizing resin



Fig.9 : Finished and polished denture in patients mouth

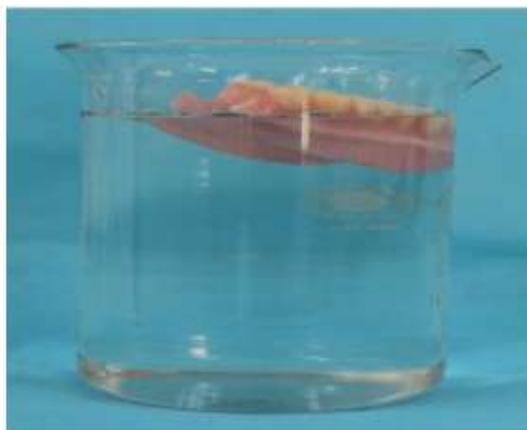


Fig.10 : Floating maxillary hollow denture



Fig.11 : Post operative frontal view

IV. Discussion

Rehabilitation of patients with severely resorbed ridges and increased inter ridge distance is a clinical challenge for the Prosthodontists. Eventhough better treatment options such as implant supported overdenture and ridge augmentation procedures are available, systemic illness , economic constraints and unwillingness for long duration surgical procedures of geriatric patients limits the treatment options to conventional dentures only. Apart from modified impression techniques to increase the denture bearing area, modifying the type of denture such as a light weight denture may also be highly appreciated by the patient¹⁴.

O Sullivan et al described an alternative method for making hollow maxillary complete dentures. He advocated heat polymerization of one portion of denture against polymerized resin , which reduced leakage at the junction of two portions of the denture, since both the portions were heat polymerized¹⁵.

Technique described in this article requires two interchangeable flasks for the fabrication of hollow maxillary complete denture. Eventhough the procedure is time consuming it considerably reduces the weight of the maxillary denture, which in turn enhances the retention , function and comfort of the patient. Special care should be employed while using this technique to avoid leakage at the junction of two portions of the denture.

V. Conclusion

Hollow maxillary complete denture is a valuable treatment option for a patient with severely resorbed maxillary ridge, increased inter ridge distance and long lip. Hollow dentures significantly increases the retention and stability of maxillary dentures by reducing the weight of the dentures. Besides this they also aid in preserving the existing residual ridge of the patient. The technique described is simple and precise which enables fabrication of hollow maxillary complete dentures. Another advantage of this technique is that the pumice-dental plaster mixture which was used for hollowing of the denture can be easily removed using any routine instrument.

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