

Hollow Complete Dentures: An Innovative Technique

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ABSTRACT

Introduction: Severe atrophy of residual alveolar ridges poses a challenge to prosthodontist. As increased inter-ridge space results in fabrication of heavy complete dentures.

Case Report: This article presents a case of severely resorbed maxillary and mandibular ridges, managed with fabrication of hollow complete dentures. It also highlights an innovative technique used for fabrication of hollow complete dentures for preservation of the denture bearing areas.

Conclusion: Fabrication a light weight denture aids in preservation of the existing residual alveolar ridge. The technique used for fabrication of hollow dentures overcomes the disadvantages of other methods.

Keywords: Hollow, Dentures

INTRODUCTION

Rehabilitation of atrophic edentulous ridges poses a clinical challenge, as there is a decreased denture bearing area for support, retention and stability.¹⁻⁵ Excessive resorption of the ridges results in increased inter-ridge space.²⁻⁵ This results in fabrication of heavy complete dentures. Heavy dentures, whether maxillary or mandibular are likely to cause poor denture bearing ability^{2,5} and excessive and constant pressure leads to bone resorption.^{5,6} Reducing the weight of the denture by making it hollow, aids in preservation of the existing residual alveolar ridge.

Numerous methods and materials have been used to fabricate a light weight denture.^{7,8} These methods include using a solid 3D spacer, cellophane wrapped asbestos⁹, silicone putty¹⁰, modelling clay, thermocol, salt, and fabricating dentures in two halves. This article describes a case report of completely edentulous patient with severely resorbed maxillary and mandibular ridges, managed by rehabilitating with hollow complete dentures.

CASE REPORT

A 62 year old male patient reported to the Department of Prosthodontics, Bharati Vidyapeeth Deemed University Dental College and Hospital, Sangli, with chief complaint of difficulty in eating due to loss of teeth. History reveals that the patient lost his teeth due to periodontal reasons. Medical history reveals that he is diabetic since 3 years and is on medication. On clinical examination, both maxillary and mandibular ridges were severely resorbed with increased inter-ridge distance.

Conventional method of denture fabrication may have resulted in a heavy complete dentures that may compound the poor denture-bearing ability of the tissues and lead to decreased retention and stability. Reduction in the weight of the dentures is found beneficial for the preservation of the denture bearing areas.

Following steps were followed for the fabrication of hollow complete dentures.

Technique

1. Fabricate the denture to the trial denture stage following conventional technique.
2. Use two split dental flasks with interchangeable top halves to construct a hollow denture.
3. Process the trial dentures in the standard manner till the wax elimination stage.
4. Adapt 2mm thickness of modelling wax to the definitive cast. Use the second cope to invest the modelling wax and complete the wax elimination process.
5. Pack with heat-polymerized acrylic resin and process. Separate the counter flask, with the permanent denture bases still attached to the master cast (Figure-1).
6. Now, in the original dewaxed cope, measure the distance from ridge-lap area of tooth to the sulcus depth margin. From the total distance 2 mm thickness of denture base and 2 mm distance from the ridge lap of the tooth is subtracted considering the strength of the denture. The value obtained determines the area for the spacer.
7. After knowing the value for the spacer, select the surgical catheter diameter according to available space. Length of the catheter is decided according to the arch form. Use 19 gauge stainless steel orthodontic wire, length slightly more than the length of the catheter, as this will aid in easy retrieval of the wires after processing of the dentures leaving a hollow space. Insert the wires into the catheter to fill the space in the catheter, so that the desired diameter is maintained.
8. Modify/bend this unit (catheter with wires) to the arch form of the cast, fix it on the cast with permanent record base using cyanoacrylate adhesive (Figure-2).
9. Do the trial closure with original cope using putty to determine whether adequate space is there for acrylic. If thinning of putty or perforation is seen, reduce the thickness of the catheter. Care should be taken not to perforate it.
10. Reseat the original flask and verify complete closure of the flask. Mix, pack, and polymerize the acrylic resin in usual manner. Recover the processed denture (Figure-3).
11. Retrieve the orthodontic wires from the catheter. Close the opening using auto-polymerizing acrylic resin. Finishing and polishing of the dentures is done in usual manner.

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Figure-1: Permanent denture bases



Figure-2: Catheter with wires attached to permanent denture bases

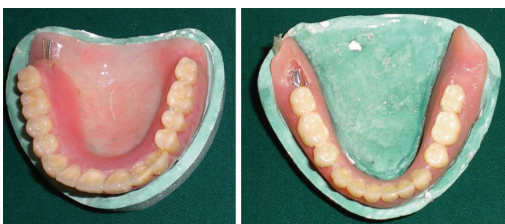


Figure-3: Maxillary processed denture with opening on one side for retrieval of wires; Figure-4: Mandibular processed denture with opening on one side for retrieval of wires



Figure-5: Patient with the dentures

Verify that the cavity is sealed by immersing the denture in water. If no bubbles are evident, an adequate seal is confirmed.

12. The dentures were inserted in the patient's mouth and was reviewed after 24 hours (Figure-4).

DISCUSSION

Extensive volume of the denture base material in prosthesis provided to patients with severe residual ridge resorption causes poor denture bearing ability. Prosthesis weight reduction have been tried by making the denture hollow.² Hollow dentures not only help in reducing the weight of the denture but also reduce the extra loads on underlying tissues and remaining amount of

bone.³

The procedure described in this article incorporates the use of surgical catheter and orthodontic wires for the fabrication of hollow cavity. This method is advantageous over the previous techniques, as it allows easy removal of the orthodontic wires leaving a hollow space. And one opening for retrieval of the material, less repair area.

Previously, vinyl poly-siloxane putty being used for the fabrication of hollow prosthesis. However, removal of putty from within the cavity, especially from the anterior region was found to be very difficult.²⁻⁴

Methods have also described fabrication of dentures in two parts and fusing these segments using auto-polymerizing resin. The long seated junction creates a site of potential leakage and discoloration over a period of time.

CONCLUSION

This article describes an innovative technique for fabrication of hollow complete denture using catheter and orthodontic wires. This technique overcomes the disadvantages of other methods as it aids in easy retrieval of orthodontic wires creating a hollow space. And a single opening for retrieval of wires which is closed using auto-polymerizing acrylic resin.

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