

# An Alcove – Simplified Technique of Fabricating Hollow Denture - A Case Report.

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### **Abstract**

**Abstract:** Aim and background: In different literature various techniques for the fabrication of hollow dentures have been described. However, the maximum available techniques are technique sensitive and have an indefinite result. Hence, this case report describes techniques to overcome these complications in order to achieve a patient-centred outcome that results in successful overall treatment.

**Case Description:** Patient gave a history of ill-fitting denture due to high weight of denture. Diagnosis includes the resorbed maxillary and mandibular ridges. So, hollow denture prosthesis planed for the patient with a 1 week and 1month follow up period.

**Conclusion:** It concluded that the denture fabricated with this new U-shaped frame technique is very light weight and effective as compared to the other techniques.

**Clinical Significance:** This technique provides the prosthesis with light weight denture, ease of fabrication, improved retention and stability as well as compliance of a patient.

**Keywords:** Hollow denture, U-shaped frame, Light weight denture, alginate mould.

## INTRODUCTION

A complete denture is considered successful when it relies on retention, stability, and support principles. An increased interridge distance often results in heavy maxillary complete denture that further reduces the retention of the prosthesis.<sup>1</sup> In such cases, denture thickness is increased which results in a heavy prosthesis. In this situation, a hollow denture can be a treatment option for a successful complete denture. This case report focuses on alternate and simplified hollow denture prosthesis fabrication techniques.

## PATIENT INFORMATION

A sixty-seven years old male patient reported to the department of prosthodontics, Pacific Dental College and Hospital, Udaipur. The patient was an old denture wearer and he came with the chief complaint of difficulty in mastication due to spontaneous cheek bites during chewing food and talking.

## CLINICAL FINDINGS

On clinical examination extra-oral features of the patient were normal. Intra-orally Atwood's order – V ridge with maxillary and mandibular arch is seen with an increased inter-arch space (fig.1a, b). Because of increased inter-ridge distance, vertical dimension at rest & occlusion, cheek bite, and poor aesthetics we decided to fabricate a hollow prosthesis.

**Timelines:** Treatment has been divided into multiple phases

**Phase 1** - Case history recording, clinical findings and diagnostic impression

**Phase 2** - Border moulding and final impression

**Phase 3** – Maxillomandibular relation recording

**Phase 4** – Try in of waxed denture

**Phase 5** – Final denture insertion

**Phase 6** – Follow up

## DIAGNOSTIC ASSESSMENT

Diagnosis of the patient done followed by diagnostic impression making and vertical dimension at rest was also measured for a good prognosis of the prosthesis.

## THERAPEUTIC INTERVENTION

The first method used to make hollow dentures was the lost salt technique which led to a bulkier and heavier prosthesis because of the inability to remove the salt completely. Therefore, rebasing of the old denture was planned with a new simplified

technique to fabricate hollow denture. This technique used modelling wax and self-cure acrylic resin. After clinical examination and case history recording the preliminary impressions were made with an irreversible hydrocolloid impression material. The secondary impressions were made with zinc-oxide eugenol impression material and master casts were fabricated. Maxillomandibular relation was recorded and mounting on a mean value articulator was done. Followed by teeth arrangement and try-in. Then the flasking of the sealed denture with a double poured method was carried out (Figure 1). To measure the hollow space the impression of this dewaxed flask was made with the help of alginate impression material. Alginate was poured into a base flask followed by closing the counter flask. (Figure 1). The set alginate mould was retrieved from the flask and height was measured using a metallic ruler and endodontic file with a stopper (Figure 1,2). Then the U-shaped frame of measured dimension was fabricated with the help of modelling wax by keeping a distance of 2-3 mm from all sides to create a space for heat cure acrylic resin while final packing (Figure 2). Then a thin shell of self-cure acrylic resin was made over the wax u-shaped frame by using sprinkle on technique. After this the wax was removed from the 3 walled shell with the help of a lacron carver (Figure 2). After this the fourth wall of the shell was fabricated by adapting a thin layer of heat cure acrylic resin material over the glass slab by a sprinkle on technique and the 3 walled shell was pressed over the glass slab (Figure 2). A hollow 3-dimensional U-shaped frame was created and trimming, finishing and polishing of the hollow acrylic U-shaped frame was done (Figure 3), and then this hollowed-out shell was rechecked by placing it in a dewaxed flask (Figure 4). After this, a thin layer of heat cure acrylic was placed in the flask on top of which the hollowed-out frame was placed and over it, a final layer of heat cure resin was added and the counter flask was closed. After processing the denture was retrieved, finished, and polished (Figure 4). The weight of the denture was measured and compared with the denture made with the lost salt technique (Figure 5). Floating test showed floating maxillary denture (Figure 5). Final insertion of the prosthesis was done (Figure 5).

## FOLLOW-UP AND OUTCOMES

Follow-up of the patient is done after 7 days and 1 month. The patient was completely satisfied with retention, stability, mastication, and phonetics with the hollow denture prosthesis.

## SIGNIFICANCE

The technique described in this case report is a simplified, time-saving procedure that resulted in a much lighter denture as compared to the lost salt technique.

## DISCUSSION

In the majority of techniques, a tedious effort is required to remove the material from the denture, and yet lightweight dentures cannot be obtained. Jaiswal PR et al. described a method of the fabrication of a hollow denture using play dough and auto polymerizing acrylic resin.<sup>4</sup> Aggarwal *et al.* used the lost salt technique.<sup>5</sup> In the lost salt technique, uniformity of the hollow part is not maintained, and the salt reacted with heat-cured acrylic resin which leads to porosity. So, this method is advantageous over the conventional as no removal of the material is required for creating hollow space.

## PATIENT PERSPECTIVE

Patient showed very good response for the new hollow denture as it was light in weight compared to

old denture prosthesis, as said by patient. Patient also talked about the improvement in retention of prosthesis as well as better phonation.

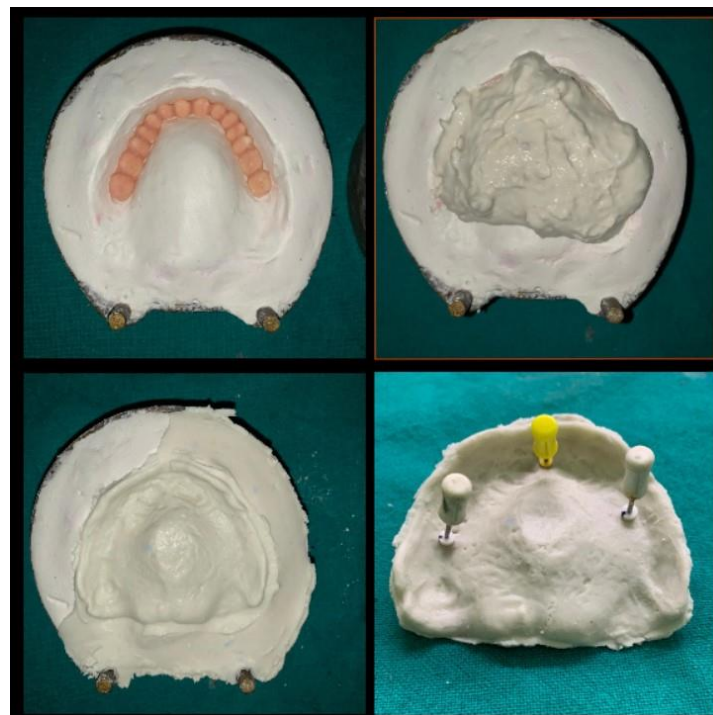
## INFORMED CONSENT

Patient has been informed regarding the benefits of the hollow denture and appropriate consent regarding the same has been taken from patient. Consent for his images and other clinical information has been taken he also has been informed regarding his name and other information will not be published and efforts will be made to conceal identity.

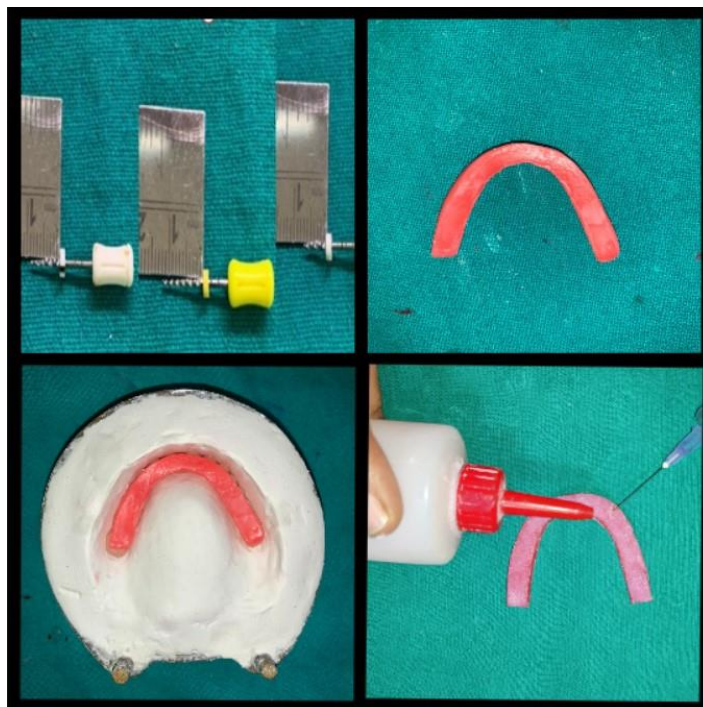
## CONCLUSION

Hollow denture allows clinician to provide a specialised denture that will enhance patient compliance and also reduce the amount of detrimental forces transmitted on underlying tissues. Also, it improves the comfort & quality of life of the patient. The method described in this case report is simplified, time saving procedure which provides promising results. It overcomes the demerits of other popularised methods in order to achieve a successful outcome.

## Figure Legends



**Figure 1** – A. Counter flask after dewaxing with an acrylic tooth before rebasing. B. Flask filled with alginate impression material. C. Flask and counter flask with a set alginate impression. D. Maxillary irreversible hydrocolloid impression mould including Endodontic files with stopper embedded in alginate mould.

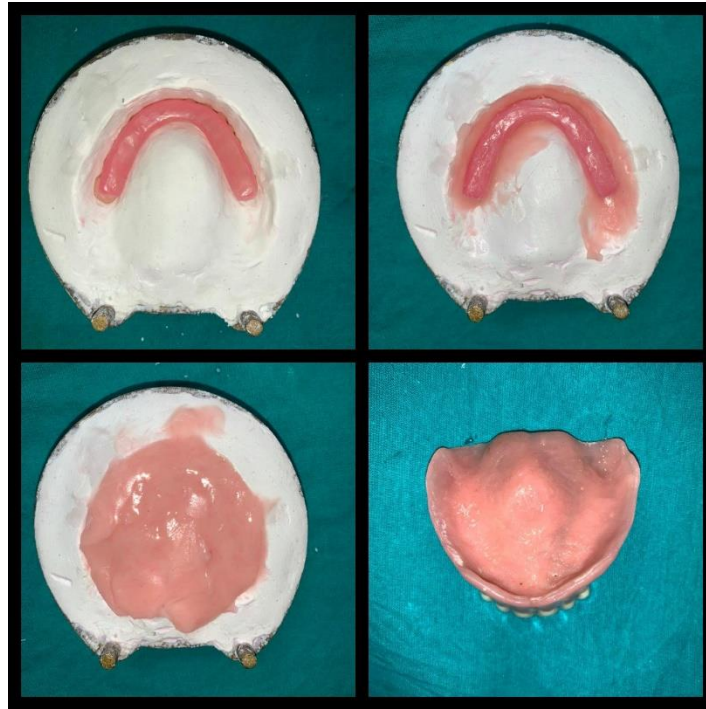


**Figure 2** – A. The height was measured using a metallic ruler and endodontic file with a stopper. B. Waxed U-shaped frame. C. Trial of waxed U-shaped frame in the flask. C. Fabrication of self-cure acrylic resin shell with the help of sprinkle on technique over waxed U-shaped frame.



**Figure 3** – A. 3 walled self-cure acrylic U-shaped shell. B. Over thin layer of self-cure acrylic resin fabricated on glass plate the 3 walled U-shaped shell was pressed and excess material was removed. C. Trimming, finishing and polishing of U-shaped frame of self-cure acrylic resin. D. Final polished self-cure acrylic U-shaped hollow frame.





**Figure 4** – A. Trial of the U-shaped Hollow frame before packing. B. U-shaped shell placed over a thin layer of heat cure acrylic resin. C. Second layer of heat cure acrylic resin placed over the U-shaped shell. D. Intaglio surface of final prosthesis having U shaped hollow shell interposed between two layers of heat cure acrylic resin.



**Figure 5** – A and B. Comparison between old denture without hollow and denture with hollow. C. Floating test showing hollowed maxillary denture and sunk mandibula denture. D. Final insertion of hollow denture prosthesis.