



## HOLLOW DENTURE: A CASE REPORT

## Dental Science

**Dr. Babita Yeshwante**

MDS, Professor and PG guide, Department of Prosthodontics and Crown and Bridge and Implantology, C.S.M.S.S Dental College, Aurangabad, Maharashtra, India. Department of Prosthodontics and Crown and Bridge and Implantology, C.S.M.S.S DENTAL COLLEGE, Aurangabad, Maharashtra, India.

**Dr. Pooja Mundada\***

BDS, Postgraduate student, Department of Prosthodontics and Crown and Bridge and Implantology, C.S.M.S.S Dental College, Aurangabad, Maharashtra, India. \*Corresponding Author

**Dr. Nazish Baig**

MDS, Professor and PG guide, Department of Prosthodontics and Crown and Bridge and Implantology, C.S.M.S.S Dental College, Aurangabad, Maharashtra, India.

**Dr. Vivek Jadhav**

MDS, Reader and PG guide, Department of Prosthodontics and Crown and Bridge and Implantology, C.S.M.S.S Dental College, Aurangabad, Maharashtra, India.

**Dr. Vishakha Patil**

BDS, Postgraduate student, Department of Prosthodontics and Crown and Bridge and Implantology, C.S.M.S.S Dental College, Aurangabad, Maharashtra, India.

**Dr. Nimisha Barve**

BDS, Postgraduate student, Department of Prosthodontics and Crown and Bridge and Implantology, C.S.M.S.S Dental College, Aurangabad, Maharashtra, India.

## ABSTRACT

Dentist bears the responsibility of providing a denture which is well fitting, light weight, well adapted and functionally stable. Complete denture success depends mainly on its retention, stability and support. Many a times we come across cases in which ridge is very resorbed, or the facial height of the patient is more, in such cases giving a conventional denture is not advisable as the weight of the acrylic of the denture will be more and thus will affect retention of the denture. This article describes a case of completely edentulous patient successfully rehabilitated with a hollow denture where a simplified technique of fabricating a light weight maxillary denture was used.

## KEYWORDS

Hollow denture, increased facial height, light weight denture, sugar syrup dough spacer

## Introduction:

"No step in denture construction should be stopped short of perfection yet many dentures are worn, which have imperfections built into them, provided they have peripheral seal sufficient to hold them in place".<sup>[1]</sup> The success of removable prostheses ultimately depends on a number of factors such as retention, stability, support, esthetics, and masticatory function. Increased intraoral inter-arch distance leads to an increase in the weight of the prosthesis. This may compromise the retention and resistance, which are key for a successful removable prosthesis. In cases of severely resorbed ridges the interarch distance increases which leads to increased height of the prosthesis. Similarly, in cases of increased facial height or longer upper lip the height of the prosthesis is more which leads to a prosthesis which is heavy. Methods used in the past to improve the retention and stability of heavy complete dentures include the use of implants,<sup>[2]</sup> the use of magnets,<sup>[3]</sup> modified impression techniques,<sup>[4]</sup> intramucosal inserts,<sup>[5]</sup> suction disks,<sup>[6]</sup> and lightweight dentures.<sup>[7]</sup>

To reduce the weight of a prosthesis it should have a cavity within it which allows the weight factor to be reduced. Some of the materials used are as three dimensional spacers are dentalstone,<sup>[8,9]</sup> cellophane-wrapped asbestos,<sup>[10]</sup> siliconeputty,<sup>[11,12]</sup> gauze rolled and coated with light-body silicone,<sup>[13]</sup> modeling clay,<sup>[14,15]</sup> and thermocol.<sup>[15]</sup>

In this clinical report a simple technique of making a light weight denture by making a hollow denture has been explained.

## Clinical Report:

A 70-year-old male patient reported for prosthetic rehabilitation of maxillary and mandibular edentulous ridges. The patient had a paralytic attack 20 years back and had slightly drooping lips on left side. He had got extraction of teeth recently done. Intraoral examination revealed well formed maxillary and mandibular edentulous ridges with increased interridge distance. The facial height was more and the upper lip was long. Hence, hollow maxillary complete denture and conventional mandibular denture was planned for this patient. Following steps were followed for the fabrication of hollow maxillary denture.

## Technique:

1. Fabricate the denture to the trial denture stage following conventional technique and do the try in appointment.
2. During the processing use two split dental flasks with interchangeable top halves to construct a hollow denture. [Figure. 1]
3. Process the trial dentures in the standard manner till the wax elimination stage. [Figure. 2]
4. Adapt 2mm thickness of modelling wax to the definitive cast and do counter flasking using interchangeable flask followed by dewaxing. [Figure. 3]
5. Pack with heat-polymerized acrylic resin and process. Separate the counter flask, with the permanent denture bases still attached to the master cast.
6. Dough of Dental Plaster-Pumice and Sugar syrup was made and rolled (equal quantities of pumice and dental plaster were taken). It was then placed over the heat cure record base (it acted as a spacer). [Figure. 4]
7. To harmonise the space for heat cure resin, strips of modelling wax was placed on the ridge lap area of acrylic teeth including the buccal and palatal surface in the cope. [Figure. 5]
8. The two halves of the flask were closed and then reopened. The thickness of the wax was then assessed with the help of the wax gauge and necessary modifications were done (spacer material was scraped wherever the wax was exposed or thinned out). This process was further repeated till the uniform thickness of the wax was achieved and thus ensured uniform space of 1.5-2mm for the heat cure acrylic resin.
9. Wax strip was then removed from the acrylic teeth.
10. The heat polymerizing resin was then mixed, packed, cured and processed in usual way.
11. Small openings were made with a bur into the denture base distal to most posterior teeth to remove the spacer.
12. The Dental Plaster-Pumice-Sugar syrup paste was then removed by using a wire and putting it in water (dough dissolves easily in water). The cavity was cleaned and disinfected. Later, these openings were closed with the autopolymerizing resin. [Figure. 6]

13. The dentures were finished and polished in the usual manner.
14. The seal was verified by putting the denture in water and checked for bubbles.
15. A hollow denture floats in water, and this was also checked by placing the denture in a tumbler filled with water.[Figure. 7]
16. Denture insertion was done.

**Discussion:**

Treating a patient with increased facial height and large interarch distance presents a challenge to the dentist as the dentist has to take care of the retention of the denture and also make sure that the denture is not too heavy or bulky. In general, a conventional (heavy) denture whether maxillary or mandibular is likely to cause poor denture bearing ability. 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 has been tried by making the denture hollow.<sup>[16]</sup> 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.<sup>[17]</sup> The technique used here uses commonly available materials and is easy to perform. The spacer made out of sugar syrup dental plaster and pumice is easy to remove from the denture after fabrication as the constituents of the dough easily get dissolved in water. The holes drilled to remove the spacer are also small and hence can be easily sealed off.

**Advantages:**

1. Reduces weight of denture.
2. 3D spacer is made out of commonly used materials.

**Disadvantages:**

1. Lengthy processing technique and hence is time consuming.
2. The denture being hollow needs to be handled with extra care as its chances of getting fractured are more.

**Conclusion:**

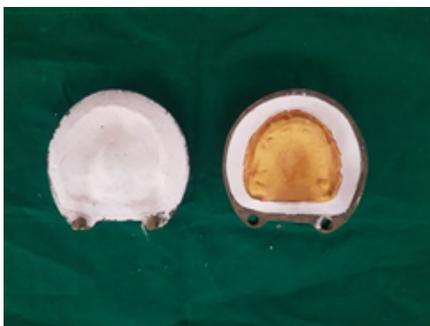
Hollow maxillary complete denture considerably reduces the weight of the prosthesis, which in turn prevents transmission of the detrimental forces, which would otherwise be transmitted from a conventional heavy prosthesis to the underlying tissue and bone.<sup>[1]</sup> Thus, it helps to preserve underlying tissue and bone. Also the technique described is easy to perform. Compared to other techniques this technique of denture fabrication can be said to be better because it uses simple materials which are easy to get and also their removal from denture after processing is easy.

**Figures:**

**Figure 1: Flask with interchangeable tops**



**Figure 2: Conventional steps followed upto wax elimination is done**



**Figure 3: 2mm thick wax sheet adapted**



**Figure 4: Dough of pumice, dental plaster and sugar syrup adapted over the heat cure record base plate**



**Figure 5: Strip of modeling wax placed over the acrylic teeth**



**Figure 6: Autopolymerising resin used to seal the small openings (seen as bright pink patches)**



**Figure 7: Denture floats in water**



**References:**

1. Laxman. S. Kaira, Richa Singh, Manish Jain, Rakesh Mishra. Light weight hollow maxillary complete denture: A case series. *Journal of Orofacial Sciences* 2012; Vol. 4(2):143-147
2. Chris CL: The effect of prosthodontic treatment on alveolar bone loss: a review of the literature. *J Prosthet Dent* 1998;80:362-366
3. Riley MA, Walmsley AD, Harris IR: Magnets in prosthetic dentistry. *J Prosthet Dent* 2001;86:137-142
4. McCord JF, Tyson KW: A conservative prosthodontic option for the treatment of edentulous patients with atrophic (flat) mandibular ridges. *Br Dent J* 1997;182:469-472
5. Gonc,alves F, Dias EP, Cestary TM, et al: Clinical and histopathological analysis of intramucosal zirconia inserts used for improving maxillary denture retention. *Braz Dent J* 2009;20:149-155
6. Fenn HRB, Liddlelow KP, Gimson AP: Fitting the finished dentures: aids to retention. In Fenn HRB, Liddlelow KP, Gimson AP (eds): *Clinical Dental Prosthetics* (ed 1). New Delhi, CSB Publishers and Distributors, 1986, pp. 406-407
7. O'Sullivan M, Hansen N, Cronin RJ, et al: The hollow maxillary complete denture: a modified technique. *J Prosthet Dent* 2004;91:591-594
8. Fattore LD, Fine L, Edmonds DC: The hollow denture: an alternative treatment for atrophic maxillae. *J Prosthet Dent* 1988;59:514-516.
9. Browning JD, Kinderknecht J: Fabrication of a hollow obturator with fluid resin. *J Prosthet Dent* 1984;52:891-895
10. Worley JL, Kniejski ME: A method for controlling the thickness of hollow obturator prostheses. *J Prosthet Dent* 1983;50:227-229
11. Holt RA Jr: A hollow complete lower denture. *J Prosthet Dent* 1981;45:452-454
12. Jhanji A, Stevens ST: Fabrication of one-piece hollow obturators. *J Prosthet Dent* 1991;66:136-138
13. Caculo SP, Aras MA, Chitre V: Hollow denture: treatment option for atrophic ridges. A clinical report. *J Prosthodont* 2013;22:217-222
14. Elliott DJ: The hollow bulb obturator: its fabrication using one denture flask. *Quintessence Dent Technol* 1983;7:13-14
15. DaBreo EL: A light-cured interim obturator prosthesis. A clinical report. *J Prosthet Dent* 1990;63:371-373
16. Himanshi Aggarwal, Sunit K. Jurel, Raghuwar D. Singh, Pooran Chand, Pradeep Kumar. Lost salt technique for severely resorbed alveolar ridges: An innovative approach. *Contemporary clinical dentistry*. 2012;3:352-355.
17. Shweta Pandurang, Caculo, Meena Ajay Aras, and Vidhya Chitre. Hollow Dentures: Treatment Option for Atrophic Ridges. A Clinical Report. *Journal of Prosthodontics*. 2013;22:217-222.