



# Hollow Maxillary Denture: A Case Report

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## ABSTRACT:

Achieving adequate retention and support in cases with excessively resorbed ridges is in itself a challenging task, which is further complicated by the presence of a large restorative space. To decrease the leverage forces, reduction in the weight of the prosthesis was recommended and was also found to be beneficial. There are studies in which it is proved that, preservation of the existing residual alveolar ridge is possible by reducing the weight of the denture, either by making a hollow denture or by altering the plane of occlusion to some extent. In addition, With the use of hollow denture, a comparable increase in retention and stability can be achieved. This case report demonstrates, treatment of a 54-year-old edentulous male patient with long lip length and increased inter-ridge distance with a hollow maxillary denture, using lost salt technique to improve the retention and stability of denture.

**KEYWORDS:** Complete denture, Hollow denture, Increased inter-ridge distance, Light weight prosthesis, long lip length, Lost salt technique.

## INTRODUCTION:

It is the dentist's responsibility to fabricate a prosthesis incorporating stability, support and retention which ultimately provide sense of fulfilment to the patient. But in some critical conditions such as long lip length or severely resorbed ridges with increased inter arch distance, though in the mandible weight is a beneficial factor but in the maxilla it is detrimental factor. Hence requirement of light weight denture is essential for better retention<sup>1</sup>. Various methods have been employed for weight reduction of the denture. Some of the techniques includes use of solid three-dimensional spacer, including salt, dental stone or sugar crystals, silicone putty, cellophane wrapped asbestos or modeling clay or glycerine soap with clear template during stage of laboratory processing to avoid denture base material incorporation into the planned hollow cavity of the prosthesis<sup>2</sup>.

Holt et al.<sup>3</sup> made a denture in which he processed a shim of indexed acrylic resin over the residual ridge. He used a spacer which was then removed and the two halves luted with auto polymerized acrylic resin<sup>3</sup>. Furthermore,

Fattore et al.<sup>4</sup> utilized a variation of the double flask technique for obturator fabrication by adding heat polymerizing acrylic resin over the definitive cast and processing a minimal thickness of acrylic resin around the teeth using a different drag. Both portions of resin were attached using a heat polymerized resin<sup>4</sup>.

O'Sullivan et al.<sup>5</sup> modified the method for fabricating a hollow maxillary denture. A clear matrix of the trial denture base was made. That base was then invested in the conventional manner till the wax elimination. By using a second flask, A 2 mm heat polymerized acrylic resin shim was made on the master cast. Silicone putty was placed over the shim and its thickness was estimated using the clear template. The original flask with the teeth was then placed over the putty and the shim. Finally, the processing was done. The putty was later removed from the distal end of the denture and the openings were sealed with auto-polymerizing resin<sup>5</sup>.

In this case report, a 54-year-old edentulous male patient with long lip length and increased inter-ridge distance was treated with a hollow maxillary denture, using lost salt technique to improve the retention and stability of dentures.

### **CASE DETAIL:**

This case is about a 54-year-old male patient who reported to the department of Prosthodontics in Dr. H.S.R.S.M's dental college and hospital, Hingoli, Maharashtra with the chief complaint of difficulty during mastication due to loss of all teeth and wanting to get them replaced.

Past medical history was not relevant, past dental history revealed that the patient was edentulous since two to three months having both maxillary and mandibular edentulous arches with no abnormality.

On examination we came to know that his upper lip was long and increased inter-ridge distance i.e. more than normal. Patient wanted to get his missing teeth replaced; hence it was decided to fabricate a hollow maxillary complete denture and conventional mandibular denture for the patient.

### **CASE REPORT:**

#### **Lost salt technique:**

1. Until try in stage, the denture was fabricated in a conventional manner
2. After the try in procedure, wax up was done and dentures were made ready for processing.
3. The mandibular denture was processed in the conventional manner [Figure 1].

The Special Steps Taken for the Fabrication of Hollow Maxillary Complete Denture were as Follows:

4. The maxillary trial denture was flaked [Figure 2] and dewaxed in the conventional manner [Figure 3].
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].
6. Above that, the remaining heat cure resin was packed and cured [Figure 5].
7. Cured denture was retrieved and 2 holes were made in the distal most posterior region and one hole was made in the anterior palatal region [Figure 6].
8. All the residual salt crystals were removed by flushing water with the high-pressure syringe through the holes.
9. After making sure that all the salt crystals have been removed, the escape holes were closed with autopolymerizing resin.
10. The hollow cavity seal was verified by immersing the denture in water, if no air bubbles are evident, an adequate seal is confirmed [Figure 7].
11. The dentures were inserted in the patient's mouth [Figure 8] and instructions regarding care, hygiene and maintenance were given. On 3-month follow up, the patient reported that he was quite comfortable with the dentures and he had encountered any problem.



Figure 1: Try in and Wax up



Figure 2: Flasking of maxillary denture



Figure 3: Dewaxed maxillary denture



Figure 4: placement of Salt crystals





Figure 5: packing of flask



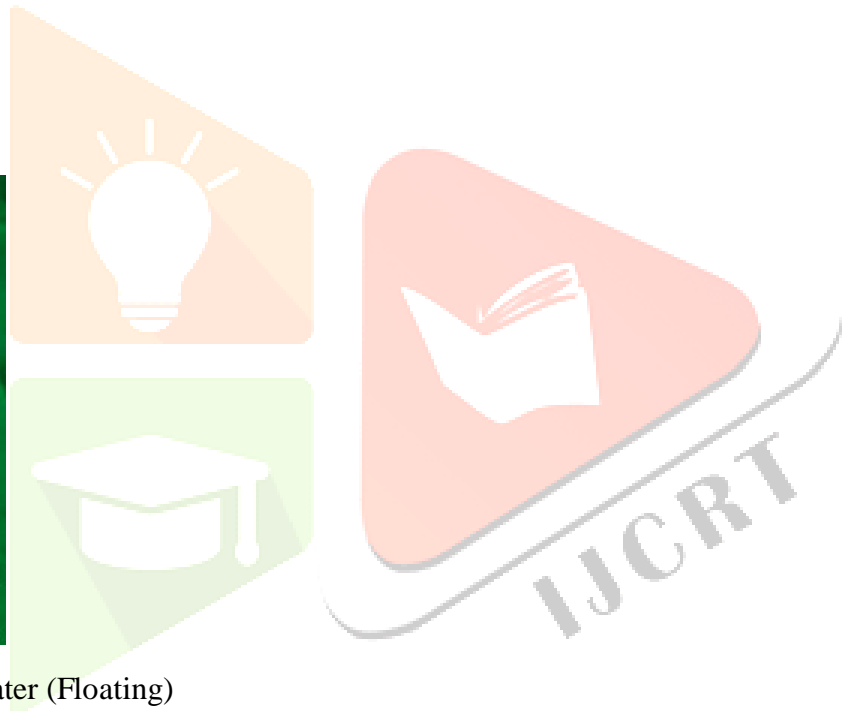
Figure 6: escape holes



Figure 7: Denture immersion in water (Floating)



Figure 8: Denture insertion





## DISCUSSION:

Reducing the weight of a maxillary denture has been shown to be beneficial when constructing the denture<sup>6</sup>. There are studies in which it is proved that, preservation of the existing residual alveolar ridge is possible by reducing the weight of the denture, either by making a hollow denture or by altering the plane of occlusion to some extent. In addition, With the use of hollow denture, a comparable increase in retention and stability can be achieved<sup>7</sup>.

A lightweight prosthesis needs a hollow cavity within its body. This can be achieved by numerous 3D spacers. Some of the materials used are dental stone, silicone putty, cellophane-wrapped asbestos, gauze rolled and coated with light-body silicone, modeling clay, and thermocol<sup>8</sup>.

Aggarwal et al.<sup>7</sup> described a case report of an edentulous patient with resorbed ridges where a simplified technique of fabricating a hollow maxillary complete denture using lost salt technique was used for preservation of denture bearing areas<sup>7</sup>. Worley et al.<sup>9</sup> described a technique producing a completely heat-cured acrylic resin hollow obturator using a “filler material” that was absent from the final prosthesis<sup>9</sup>. DaBreao et al.<sup>10</sup> demonstrated a new method of preparing light-cured maxillary interim hollow obturator prosthesis<sup>10</sup>.

Jhanji et al.<sup>11</sup> described the technique, which was a controlled process in which the thickness of the obturator could be easily modified by adding to or shaving off the dimensionally stable silicone putty<sup>11</sup>. Kaira et al.<sup>12</sup> described two case reports of edentulous patients with resorbed ridges where a simplified technique of fabricating a light weight hollow maxillary complete denture was used for the preservation of denture bearing areas<sup>12</sup>.

Shetty et al.<sup>13</sup> described a case report of an edentulous patient with resorbed ridges where a simplified technique of fabricating a light weight maxillary complete denture was used for preservation of denture bearing areas<sup>13</sup>. Radke et al.<sup>14</sup> in her clinical report described a simple technique of fabricating a hollow maxillary complete denture in a patient with resorbed maxillary and mandibular ridges with increased interridge distance which reduced the weight of the prosthesis and thereby enhanced the retention<sup>14</sup>.

The method described in this case report 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 technique of lost salt technique is simple to execute and utilizes a very cheap and easily available spacer material.

### Indications

1. Increased interridge distance.
2. Long upper lip length
3. Resorbed residual ridges.

### Advantages

1. Commonly used materials are used for its fabrication.
2. Reduces weight of the prosthesis which in turn enhances retention.

### Disadvantages

1. Time-consuming procedure.
2. Hollow denture is prone to fracture.
3. Uneven thickness

### Precautions

1. There should be adequate thickness of resin around the cavity.
2. Seal around the window should be perfect and should be checked for leakage.
3. Denture care instructions should be given to the patients.

4. Special instructions regarding handling of the denture should be given as the dentures are prone to fracture.

## CONCLUSION:

Resorption of maxillary residual alveolar ridge is a complex biophysical process affected by anatomic, prosthodontic, metabolic, functional, and other factors, and its rehabilitation is a challenge to the prosthodontist. Methods used in the past to improve the retention and stability of heavy complete dentures include the use of implants, the use of magnets, modified impression techniques, intramucosal inserts and suction disks. Many a times the patients who comes with such a problem are geriatric patients with many systemic illnesses. Hence, the best way is to rehabilitate them with conventional complete dentures. Apart, from modifying the impression technique to get maximum denture bearing area, modifying the type of denture also may be better accepted by patients. Hence, less denture weight provides for healthy and comfortable living.

## REFERENCES

1. Chaturvedi S, Verma AK, Ali M, Vadhvani P. Hollow maxillary denture: A simplified approach. People's J Sci Res 2012;5:47-50.
2. Vadodaria J, Paul P, Sabarigirinathan C. Maxillary Hollow Denture with Lost Salt Technique: The Simplified Successful Approach. IOSR-JDMS 2019;18:65-70.
3. Holt RA Jr. A hollow complete lower denture. J Prosthet Dent 1981;45:452-4.
4. Fattore LD, Fine L, Edmonds DC. The hollow denture: An alternative treatment for atrophic maxillae. J Prosthet Dent 1988;59:514-6.
5. O'Sullivan M, Hansen N, Cronin RJ, Cagna DR. The hollow maxillary complete denture: A modified technique. J Prosthet Dent 2004;91:591-4.
6. Gundawar S, Zamad.A, Sneha Gundawar Light weight dentures: An innovative technique. Contemporary Clinical Dentistry 2014; 5:134-7.
7. Aggarwal H, Jurel SK, Singh RD, Chand P, Kumar P. Lost salt technique for severely resorbed alveolar ridges: An innovative approach. Contemp Clin Dent 2012;3:352-5.
8. Prem Bhushan et al. The Hollow Maxillary Complete Denture: A Simple, Precise, Single-Flask Technique Using a Caramel Spacer. Journal of Prosthodontics 2017;13e-17e.
9. Worley JL, Kniejski ME. A method for controlling the thickness of hollow obturator prostheses. J Prosthet Dent 1983;50:227-9.
10. DaBreo EL. A light-cured interim obturator prosthesis. A clinical report. J Prosthet Dent 1990;63:371-3.
11. Jhanji A, Stevens ST. Fabrication of one-piece hollow obturators. J Prosthet Dent 1991;66:136-8.
12. Kaira LS, Singh R, Jain M, Mishra R Light weight hollow maxillary complete denture: A case series. J Orofac Sci 2012;4:143-7.
13. Shetty V, Gali S, Avindram SR. Light weight maxillary complete denture: A case report using a simplified technique with thermocol. J Interdiscip Dent 2011;1:45-8.
14. Radke U, Mundhe D. Hollow maxillary complete denture. J Indian Prosthodont Soc 2011;11:246-249.