

## Maxillary Hollow Denture with Lost Salt Technique: The Simplified Successful Approach.

<sup>1</sup>Dr. Jill Vadodaria, <sup>2</sup> Dr. Priyanjali Paul, <sup>3</sup> Dr. C. Sabarigirinathan

<sup>1</sup>(MDS), <sup>2</sup> (MDS) <sup>3</sup> (MDS, PhD Head of the Department of Prosthodontics,

Tamil Nadu Govt. Dental College & Hospital)

Corresponding Author:- Dr. Priyanjali Paul

---

**Abstract:** Complete denture therapy for the patients with edentulous arches is an age old form of dental treatment modality. Residual ridge resorption poses a clinical challenge for the fabrication of an effective and successful prosthesis. Severely resorbed maxillary edentulous ridges are usually narrow and constricted. There is increased inter ridge space causing reduction in retention, support and stability. The ensuing weight of the processed complete denture compromises them further. This article describes the case report with step by step procedure for a patient having atrophic ridges using a hollow maxillary complete denture.

**Key Words:** hollow denture, resorption, edentulous, lost salt technique, complete denture

---

Date of Submission: 10-05-2019

Date of acceptance: 27-05-2019

---

### I. Introduction

Residual Ridge Resorption is predictable phenomenon following the loss of dentition occurring in edentulous individuals. However, the rate of resorption varies depending on the anatomic, metabolic or mechanical factors(1). Following severe resorption of ridge there is substantial increase inter-ridge space. This leads to fabrication of complete dentures that are more in weight. Heavy dentures, regardless of whether maxillary or mandibular causes poor denture bearing ability. Further, extreme and constant pressure results to bone resorption as well as decrease in retention(2) and stability of denture . Also, these dentures are causes discomfort and inconvenience to the patients.(3) The ultimate goal is therefore reducing the weight(4) of the denture by making it hollow for aiding in preservation of the existing residual alveolar ridge. Numerous methods have been employed for weight reduction of the denture. Some of the techniques includes use of solid three-dimensional spacer, or including dental stone, salt or sugar crystals(5), cellophane wrapped asbestos(6), silicone putty(7) (8) (9) or modeling clay(10)(11) or glycerine soap with clear template(12) during stage of laboratory processing to prevent denture base material incorporation into the planned hollow cavity of the prosthesis.

Holt et al,(7) fabricated a shim of indexed acrylic resin above the residual ridge after Spacer was adapted. It was then removed and the two halves were sealed with auto polymerizing acrylic resin. Fattore et al(13), used 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. O'Sullivan et al(8), described a modified method for fabricating a hollow maxillary denture. A clear matrix of the trial denture base was made. The trial denture base was then invested in the conventional manner till the wax elimination. A 2 mm heat polymerized acrylic resin shim was made on the master cast using a second flask. 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 and 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.

Shetty et al(14) incorporated thermocol in to the hollow space of the denture prosthesis. This material being so light was left there saving the effort for removal of spacer material.

Deogade et al(15) described technique in which clear template is fabricated and gelatin is introduced in the cavity for occupying space and later removed after processing.

### Case Report:

A 58 year old male patient reported to the Department of Prosthodontics in Tamil Nadu Government Dental College and Hospital, with the chief complaint of inability to chew food properly and lose fitting upper denture .Medical history revealed that patient was diabetic in well controlled stage and was on oral hypoglycemic agents. Past dental history revealed that patient was edentulous past 7 years. On examination

maxillary ridge was moderately resorbed while there was severe resorption of mandibular ridge. However, the patient had presence of long upper lip [Figure 1]



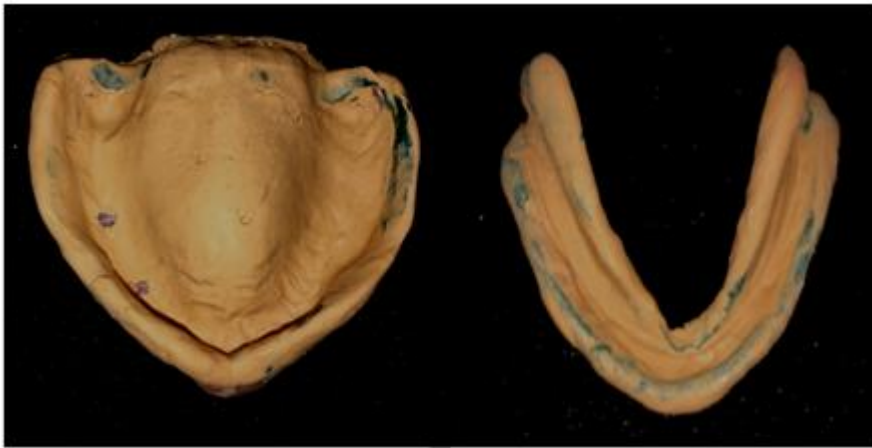
with the inter-ridge distance more than normal. The old denture of the patient was very heavy as well as non-retentive. Subsequently, the treatment planning was fabrication of a new set of denture for the patient. The following treatment modalities were available to the patient for the new complete denture: (a) Implant supported complete denture (b) Conventional Complete denture. (C) Hollow maxillary complete denture with conventional mandibular complete denture. All options were explained in detail to the patient. The patient rejected the option for implant due to cost factor. The patient was already having problems because of the increased weight of the previous denture so he decided to proceed for hollow maxillary complete denture.

**Technique:**

Upper and Lower Primary impressions were made by means of impression compound. A wash of alginate impression was made for the lower primary impression for recording accurate details. (16) (Figure 2).



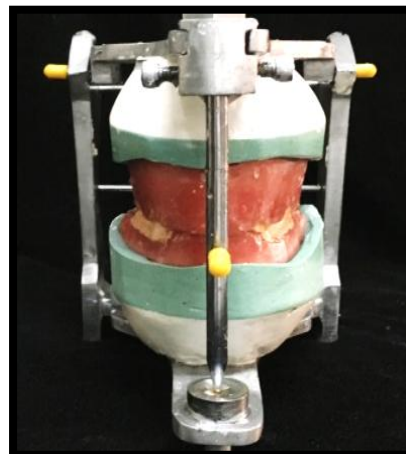
The Impressions were poured with dental plaster and primary maxillary and mandibular casts were retained. Special trays were fabricated on these casts with autopolymerizing acrylic resin. Border molding were done with green stick compound and Final impression was made with Zinc Oxide Eugenol Paste. (Figure 3)



The impressions were beaded and boxed and then poured with Type 3 dental stone and master casts were retrieved. Record bases were fabricated with autopolymerizing resin and jaw relation was recorded. (Figure 4)



This was transferred to articulator and mounting of maxillary and mandibular cast was done.(Figure 5)



Teeth setting was completed. Try in was verified (Figure6) for fit, aesthetics and maxilla- mandibular relation.



The earlier steps are in conventional manner. Only during processing phase changes are made. Mandibular denture was continued for processing in conventional manner. Hollow maxillary denture was fabricated using a dental flask with two interchangeable counter lids. Normal standard flasking was done for the upper partial denture followed by the dewaxing. (Figure 7)



A wax shim of approximately 2 mm thickness was adapted covering the maxillary denture base area covering notches and land area and tooth portion (Figure 8).



The separating media was applied over the plaster with a brush. Then, flasking was completed using the second counter lid of the flask. The first lid along with the denture base was left aside. After flasking, dewaxing was carried out and it was processed in heat cure. Acrylic resin to form the lower half of the Maxillary denture. The second lid was withdrawn subsequently after processing and the first lid was replaced with the assistance of indentations. The two parts were verified together for interference and excess acrylic resin was removed that would prevent complete flask closure. Salt Crystals were added on the newly processed denture base part. A thin cellophane sheet of 0.5mm was adapted over it to prevent invasion of heat cured acrylic resin. (Figure 9)



The denture was then packed with heat cured acrylic resin and cured at 74 degree Celsius at 7-8 hours. The denture with salt crystals was retrieved from the flask. Two small openings were made using a bur into the denture base distal to the most posterior teeth. Hot water was injected using syringe and all the dissolved salt was flushed out from the other end. ( Figure 10)



The holes were sealed with autopolymerizing resin after complete removal of salt. The denture was finished and polished in usual manner. The seal was verified by placing it in water ensuring no air bubbles are formed. The fabricated denture was floating during this step. After evaluation of the seal, the denture insertion was done. Occlusion was verified. Post-operative denture care instructions were given.



## II. Discussion

There has been constant challenge for the dentist for fabrication of complete dentures with severely resorbed ridge and increased lip length. Implants are always first choice for such patients in this advancement era along with residual ridge augmentation. But many patients cannot accept this modality because of several reasons like increased age, economic factors, unwillingness for prolonged treatment or any presence of systemic disease.

The technique described here is very simple, successful and cost effective. It is easy to execute, the salt crystals used here melt during curing stage. So, by immediately flushing them out there are no residual crystals

remaining thereby aiding in preservation of the integrity of the denture. There is absence of the time consuming tedious work for removal of spacer material from the denture. Furthermore, preservation of residual ridge as well as comparable increase in retention and stability is achievable. Thus the main goal of establishing of function, comfort and esthetics is accomplished.

### **III. Conclusion**

The use of hollow denture is the good option for the patients having residual ridge resorption where, increased weight of the prosthesis is contributing factor to their problems. This treatment modality is economic, non-invasive with ease of application and successful in achieving better quality of life for patient.

### **References**

- [1]. Atwood DA. Some clinical factors related to rate of resorption of residual ridges. 1962. *J Prosthet Dent* . 2001 Aug 1;86(2):119–25.
- [2]. Brown KE. Fabrication of a hollow-bulb obturator. *J Prosthet Dent*. 1969 Jan 1;21(1):97–103.
- [3]. Ohkubo C, Hosoi T. Effect of weight change of mandibular complete dentures on chewing and stability: A pilot study. *J Prosthet Dent*. 1999 Dec;82(6):636–42.
- [4]. Ackerman AJ. The prosthetic management of oral and facial defects following cancer surgery. *J Prosthet Dent*. 1955 May 1;5(3):413–32.
- [5]. aGGarwal hiManshi, jurel sunit, sinGh raGhuwar, Chand P, kuMar P, Kumar Jurel S, et al. Lost salt technique for severely resorbed alveolar ridges: An innovative approach. *Contemp Clin Dent*;3(3). Available from:
- [6]. Worley JL, Kniejski ME. A method for controlling the thickness of hollow obturator prostheses. *J Prosthet Dent*. 1983 Aug 1;50(2):227–9.
- [7]. Holt RA. A hollow complete lower denture. *J Prosthet Dent*. 1981 Apr;45(4):452–4.
- [8]. O’Sullivan M, Hansen N, Cronin RJ, Cagna DR. The hollow maxillary complete denture: a modified technique. *J Prosthet Dent* 2004 Jun;91(6):591–4.
- [9]. Singh Kaira L, Singh Negi K, Parihaar S, Bisht R. LIGHT WEIGHT HOLLOW DENTURE – A CASE SERIES 1 2 3 4.
- [10]. Elliott DJ. The hollow bulb obturator: its fabrication using one denture flask. *Quintessence Dent Technol*. 1983 Jan;7(1):13–4.
- [11]. DaBreo EL. A light-cured interim obturator prosthesis. A clinical report. *J Prosthet Dent*. 1990 Apr 1;63(4):371–3.
- [12]. Qanungo A, Aras MA, Chitre V, Mysore A, Da Costa GC. An Innovative and Simple Technique of Hollow Maxillary Complete Denture Fabrication. *J Clin Diagn Res*. 2016 Aug;10(8):ZD23-5.
- [13]. Fattore LD, Fine L, Edmonds DC. The hollow denture: an alternative treatment for atrophic maxillae. *J Prosthet Dent*. 1988 Apr;59(4):514–6.
- [14]. Gali S, Ravindran S, Shetty V. Light weight maxillary complete denture: A case report using a simplified technique with thermocol. *J Interdiscip Dent*. 2011;1(1):45.
- [15]. Deogade SC, Patel A, Mantri SS. An alternative technique for hollowing maxillary complete denture. *J Indian Prosthodont Soc*. 2016(4):412–5.
- [16]. Fernandes A, Dua N, Herekar M. Corrective primary impression technique. *Open Dent J*. 2010 Apr 14;4:27–8.

Dr. Priyanjali Paul. “Maxillary Hollow Denture with Lost Salt Technique: The Simplified Successful Approach.” *.IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 5, 2019, pp 65-70.