

Maxillary Hollow Denture Using Innovative Technique for Resorbed Ridges: Case Report

¹Shrivastava M, Postgraduate student Dept. of prosthodontics, People's college of dental science and research center, People's university, Bhopal, India

²Parlani S, MDS, HOD and professor Dept. of prosthodontics, People's college of dental science and research center, People's university, Bhopal, India

³Shrivastava KJ, MDS, Professor Dept. of prosthodontics, People's college of dental science and research center, People's university, Bhopal, India

Corresponding Author: Monika Shrivastava, Postgraduate student Dept. of Prosthodontics, People's college of dental science and research center, People's University, Bhopal, India.

Citation of this Article: Shrivastava M, Parlani S, Shrivastava KJ, "Maxillary Hollow Denture Using Innovative Technique for Resorbed Ridges: Case Report", IJDSIR- May - 2021, Vol. – 4, Issue - 3, P. No. 408 – 412.

Copyright: © 2021, Monika Shrivastava, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Resorption of maxillary bone and dolicocephalic face causes problem in fabrication of dentures and often resulted in heavy dentures. In this article, an alternative innovative treatment approach for fabrication of maxillary hollow denture has been proposed. Fondant is the material of choice opted for fabrication of maxillary hollow denture in this article. This approach ensures easy, simple and cost effective method for hollow maxillary dentures fabrication.

Keywords: Complete dentures, fondant technique, hollow maxillary denture, resorbed ridges.

Introduction

Resorbed ridges are commonly seen in geriatric patients, which results in instability of complete dentures. Increase in interarch distance is common sequelae of resorbed ridges. Fabrication of complete dentures in patients having

dolicocephalic face along with resorbed ridges may result in heavier dentures and lead to their instability, decreased retention and support area.

Various techniques have been proposed to reduce the weight of complete dentures but at the same time they are expensive like flexible dentures which are made up of nylon based thermoplastic resin¹. Valplast and lucitone are monomer free.² Other techniques for reducing the weight of complete dentures are by making them hollow using salt technique^{3,4,5,6}, play dough technique or modeling clay⁷; using silicone putty^{8,9} and thermocol¹⁰ in the desirable space and later removing them. It has been seen that the hollow dentures are better retentive, increases the patient's satisfaction and are comfortable to the patients as they are light weighted with reduction in the excess weight of acrylic resin.

In this case report, 54 yr old male patient with resorbed ridge and dolicocephalic face with increased inter ridge distance was treated with maxillary hollow dentures using fondant technique which improved the retention of the dentures and increases the patient's satisfaction.

Case Report

A 54 yrs old male patient reported to the Department of Prosthodontics, with the chief complaint of unable to masticate due to absence of teeth. Patient has been edentulous since 7 yrs and was not a denture wearer. Ridges were resorbed with increase in inter ridge distance and with dolicocephalic face, so hollowing of maxillary complete denture was planned for the patient.

Technique

Preliminary impression was made by using impression compound and primary cast was made. Custom tray fabrication was done by using cold cure acrylic resin and peripheral tracing using green stick was completed and final impression made by using zinc oxide impression paste. Impression was poured by using type III type of dental stone and cast was made. Occlusal rims were made by using modeling wax and recording of jaw relation was done and transferred to articulator. Teeth arrangement and tryin was done. After tryin the trial mandibular denture was processed by the conventional technique.

Special steps for fabricating maxillary hollow denture

1. Maxillary trial denture was then sealed with the cast and duplication was done by using irreversible hydrocolloid and then poured in dental stone. (Fig1)



Figure 1:Maxillary trial denture sealed with cast

2. A template was made onto the duplicated cast using 1mm of thermoplastic sheet using vacuum press machine. (Fig 2)



Figure 2: Duplicated sealed trial denture with template of thermoplastic sheet

3. Split denture flasks were used with interchangeable counter flasks.

4. After that maxillary trial denture was processed till the wax elimination in 1st base and 1st counter flask. (Fig3)



Figure 3: Dewaxed casts

5. Permanent heat cured acrylic denture resin record base was made using 2mm thick base plate wax on master cast in base 1 with counter flask 2. (Fig4)



Figure 4: Permanent record base with interchangeable flask

6. Deflasking was done and fondant was rolled and placed on the permanent record base conforming to the shape of the arch and clear template was placed over that to verify that 1 mm of space remains in between the teeth and fondant. (Fig5a and Fig5b)

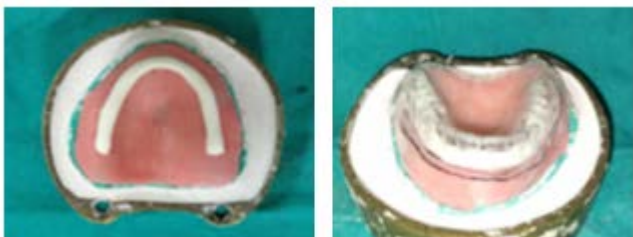


Figure 5a: Fondant adapted on permanent record base

Figure 5b: Template was placed to check for space

7. Then template was removed and mixing of heat cure type of acrylic denture resin was done and placed carefully over the fondant, trial closure using base 1 counter flask 1 was done and check for any corrections needed and then the denture was processed.

8. After processing, deflasking was done and denture was removed in a usual manner. Laboratory remounting was done and any processing errors were corrected.

9. Finishing of maxillary denture was done.

10. Two small openings were made using the bur on the distal to the most posterior tooth and the fondant was removed by scrapping it and dipping it in water.(Fig 6)



Figure 6: Dentures with holes for removal of spacer

11. The cavity was cleaned properly and was disinfected. Later, the openings were made closed using cold cure resin in dough stage and then polishing was done in a usual manner. (Fig 7)



Figure 7: Sealed dentures

12. Holes were checked for any leakage (Fig 8) and dentures were inserted in patient's mouth and instructions were given. (Fig9)



Figure 8: Light weighted hollow denture



Figure 9: Postoperative frontal view

Discussion

To rehabilitate a patient with resorbed ridge with complete dentures is always a challenge for the prosthodontist. Other methods such as implant supported overdentures or ridge augmentation can be used for resorbed ridge cases but due to some constraints these cannot be used in some

patients like geriatric patient who are unwilling to go for any surgical procedure or due to financial reasons. In that case, conventional dentures are the only option left for their rehabilitation.

Patient with long facial length and resorbed ridge will usually results in fabrication of heavy and bulky dentures, which further causes ridge resorption and discomfort to the patient. So, the concept of hollow dentures were used by many clinicians to make the dentures light weighted .

There are many techniques of fabrication of hollow dentures-

Holt¹¹ made acrylic resin shim on the resorbed ridges and a spacer was used, indexed the resin and then other remaining denture was processed over this shim and spacer. Later removed the spacer and join the two halves using autopolymerizing acrylic resin.

Fattore et al¹² used double flask technique as a variation for obturator fabrication. He used heat cure resin for definitive cast and processed a minimum thickness of resin around teeth by use of a different drag and then join the two parts using heat cure type of acrylic resin.

O'Sullivan *et al*⁹ used a modification for fabricating hollow maxillary denture. He made clear matrix of trial denture base and investing in conventional manner till elimination of wax stage was done. Then using second flask, prepared a shim of heat cured resin of 2 mm in thickness on master cast and silicone putty placed on that. Estimation of the thickness using clear template was done. Then original flask with teeth was placed on putty and resin shim, and processing was done. Later the putty was removed from distal corner of the dentures and sealed the openings with autopolymerizing acrylic resin.

The technique was good but at the same time removal of putty from anterior portion of dentures was difficult and to remove that large holes were made at distal corner which makes them look unesthetic.

The technique described in the article is a new approach for fabrication of hollow dentures and has added advantage over the others. Here, fondant was used for hollowing out the maxillary dentures. Fondant is an icing which is used to decorate the cakes and pastries. It is prepared by using sugar, water, gelatin and glycerine. It can be easily available at any confectionery shops. The material easily holds shape so easy to use during packing of acrylic resin and readily dissolvable in water so can be easily removed from the cavity especially in the anterior region without leaving any residue. Since it is made up of mainly sugar and gelatin so it also does not react with resins. So, overall this technique is simple, time saving and very economical. Also this technique allows control of thickness of acrylic resin occupying the hollow portion ensuring even depth of acrylic resin to prevent any seepage and deformation during the flask closure.

Conclusion

Hollow maxillary denture is one of the methods to reduce the excessive weight of maxillary dentures in patients with resorbed residual ridge in which implants are not practically possible. This will result in light weighted dentures which have good retention and stability. It will also help to preserve the existing residual ridge. The technique described in this article is simple and easy to execute with added advantages over the other techniques. The technique is effective and is comfortable for the patient.

References

1. Singh JP, Dhiman RK, Bedi RP, Girish SH. Flexible denture base material: A viable alternative to conventional acrylic denture base material. *Contemp Clin Dent* 2011 Oct;2(4):313.
2. Kaira LS. Maxillary hollow denture: A case series. *J Orofac Res* 2012;2:109-12.
3. 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 Jul;3(3):352.
4. D'souza KM, Aras MA. A simple approach to hollow maxillary complete denture fabrication: An innovative technique. *J dent Allied* 2017 Jul 1;6(2):84.
5. Kumar UK, Murgod S. Hollow complete denture for resorbed ridges. *Int J Oral Health Sci* 2018 Jul 1;8(2):60.
6. Vadodaria J, Paul P, Sabarigirinathan C. Maxillary Hollow Denture with Lost Salt Technique: The Simplified Successful Approach. *J Med Dent Sci.* 2019;18,65-70.
7. Gundawar S, Zamad A, Gundawar S. Light weight dentures: An innovative technique. *Contemp Clin Dent* 2014 Jan;5(1):134.
8. Radke U, Mundhe D. Hollow maxillary complete denture. *J Indian Prosthodont Soc* 2011;11:246-9.
9. O'Sullivan M, Hansen N, Cronin RJ, Cagna DR. The hollow maxillary complete denture: A modified technique. *J Prosthet Dent* 2004;91:591-4.
10. Gupta R, Luthra RP, Singh R. A hollow complete denture using Thermocol: A case report. *Int. J. Appl. Dent. Sci.* 2017;3:409-11
11. Holt RA Jr. A hollow complete lower denture. *J Prosthet Dent* 1981;45:452-4.
12. Fattore LD, Fine L, Edmonds DC. The hollow denture: An alternative treatment for atrophic maxillae. *J Prosthet Dent* 1988;59:514-6.