

**HOLLOW MAXILLARY DENTURE- COMBINATION OF SILICON PUTTY
TECHNIQUE AND LOST SALT TECHNIQUE****Dr. Rupali Kamath¹, Dr. Sarandha D. L.², Dr. Javad Saleem³, Dr. Navin Kumar Sahu⁴ and Dr. Himaja Nadimpalli^{*5}**¹Professor & Head, Department of Prosthodontics, Dr. Syamala Reddy Dental College Hospital and Research Centre Bangalore.²Professor, Department of Prosthodontics, Dr. Syamala Reddy Dental College Hospital and Research Centre Bangalore.³Senior Lecturer, Department of Prosthodontics, Dr. Syamala Reddy Dental College Hospital and Research Centre Bangalore.⁴Post Graduate Student, Department of Prosthodontics, Dr. Syamala Reddy Dental College Hospital and Research Centre Bangalore.⁵Post Graduate Student, Department of Prosthodontics, Dr. Syamala Reddy Dental College Hospital and Research Centre Bangalore.***Corresponding Author: Dr. Himaja Nadimpalli**

Post Graduate Student, Department of Prosthodontics, Dr. Syamala Reddy Dental College Hospital and Research Centre Bangalore.

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ABSTRACT

It is the dentist's responsibility to fabricate a prosthesis incorporating stability, retention, and support which ultimately provide satisfaction to the patient. But in the critical conditions such as long lip length or severely resorbed ridges with increased inter arch distance, the weight of a maxillary denture is often a dislodging factor. Hence, a lightweight denture is required for better retention. This article describes a case of the completely edentulous patient successfully rehabilitated with a hollow denture where a simplified technique of fabricating a lightweight maxillary denture was used. This article incorporates easy removal of silicone putty from the two inner halves of a maxillary denture, thus making the inner area hollow. It also describes the lost salt technique for the fabrication of hollow denture. This ensures that the weight of the denture is reduced.

KEYWORDS: Complete dentures, hollow maxillary denture, putty index technique, lightweight dentures, residual ridge resorption.

INTRODUCTION

Extreme resorption of the maxillary denture-bearing area may lead to problems with prosthetic rehabilitation due to a narrower, more constricted residual ridge as resorption progresses, decreased supporting tissues, and a resultant large restorative space between the maxillary residual ridge and opposing mandibular teeth. The latter may result in a heavy maxillary complete denture that may compound the poor denture bearing ability of the tissues and lead to decreased retention and resistance.^[3]

Various methods have been done to reduce the weight of maxillary dentures. Historically, weight reduction approaches have been achieved using a 3-dimensional space, including dental stone, cellophane wrapped asbestos, thermocol, silicone putty or modeling clay during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis.^[3]

Fattore, et al. used a variation of a 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 then attached using heat polymerized resin. Holt processed a shim of acrylic resin over the residual ridges and used a space. (Insta-mold, Nobileum, Albany, NY). The resin was indexed and the second half of the denture processed against the spaces and the shim. The spaces were then removed and the two halves luted with auto polymerized acrylic resin using the indices to facilitate positioning. The primary disadvantage of such techniques is that the junction between the two previously polymerized portions of the denture occurs at the borders of the denture. This is a long junction with an increased risk of seepage of fluid into the denture cavity. A further disadvantage is that it is difficult to gauge resin thickness in the cope area. Silicone putty was used to make the denture cavity hollow but removing the silicone from the processed denture was difficult and time consuming.^[1]

Holt (1981) processed a shim of indexed acrylic resin over the residual ridge and used a spacer which was then

removed and the two halves luted with auto polymerized acrylic resin.^[2]

O'Sullivan et al (2004) 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 a conventional manner until the wax elimination. A 2mm heat-polymerized acrylic shim was made on the master cast, using the second flask. Silicone putty was placed over the shim and its thickness was estimated using a clear template. The original flask with the teeth was then placed over the putty and the processing was done. The putty was later removed from the distal end of the denture and the openings were sealed with autopolymerizing resin.^[2]

The technique was used in the estimation of the spacer thickness, but the removal of the putty was found to be difficult especially from the anterior portion of the denture. Moreover, the openings made on the distal end had to be sufficiently large to retrieve the hard putty.

CASE REPORT

A 56-year-old patient walked into the outpatient Department of Prosthodontics with a chief complaint of replacing missing teeth. He had been edentulous for 8 years and had been wearing dentures for 7 years. On examination, he had severely resorbed ridges, the upper being narrow and constricted and with an interridge space of 30 mm. Both maxillary and mandibular ridges were severely resorbed. His upper lip was long, the inter-ridge distance was more than the normal and vertical dimension of occlusion (VDO) and vertical dimension at rest (VDR) was more than average. The previous denture of the patient was heavy with attrited teeth and was under extended. Hence, it was decided to fabricate a new set of denture for the patient.

The treatment options for complete denture available to the patient were:

- a. Implant supported complete denture
- b. Conventional Complete denture.
- b. Hollow maxillary complete denture and conventional mandibular complete denture.

After analyzing each available option, it was decided to fabricate hollow maxillary complete denture. The patient also approved of the treatment modality as it was light in weight, inexpensive and non-surgical procedure.

Technique

- 1) Preliminary and final impressions were made in a conventional manner. At the time of jaw relation due consideration was given to adjust maxillary occlusal rims properly as to provide proper aesthetics to the patient with a long upper lip. Teeth were selected and arranged in balanced occlusion and try-in was done first for anterior teeth and then for posterior teeth. (Fig 1).

- 2) For making the Maxillary denture, hollow interchangeable flasks were used. The trial dentures were processed in the standard manner up to the wax elimination stage (Fig 2).
- 3) The compartment of the flask containing the maxillary cast is taken and base plate wax is adapted on the impression surface of the cast and flask with an interchangeable flask. Dewaxing is done and the denture curing is done with DPI Heat cure Acrylic. (Fig 3 & Fig 4).
- 4) The other compartment of the flask containing the teeth is taken and 2 layer thickness of base plate wax is adapted over the teeth and trough-like depression is made in the base plate wax to create space for the silicone putty (Fig 5).
- 5) Silicone putty (Aquasil, Dentsply Detrey, Konstanz, Germany) is mixed and made in the form of rope and adapted over the ridge area of the cured denture base (Fig 6). Then the flask lids were closed and the silicone putty placed on the denture base forms an index for hollow space for the denture.
- 6) Heat polymerized acrylic resin is mixed and placed over the removed wax area and trial closure is done along with the putty index. The putty index is removed after trial closure provides a proper reservoir for salt for further processing.
- 7) The two halves of the flask were closed and heat polymerizing resin was then processed as per the manufacturer's instructions.
- 8) After curing, lab remounting was done and the processing errors were corrected.
- 9) Two small openings were made with a bur into the denture base distal to most posterior teeth to remove the salt (Fig 7).
- 10) The salt was then removed by irrigation with water using a 2mm syringe through the access holes created posterior to the teeth. The cavity was cleaned and disinfected.
- 11) Later, these openings were closed with the autopolymerizing resin in dough stage. The dentures were then polished in a usual manner.
- 12) The sealing of the cavity was then verified by placing it in water and checked for any bubbles (Fig 8). The dentures were inserted in the patient's mouth and instructions were given (Fig. 9).



Fig-1.



Fig- 2.



Fig-6.



Fig-3.



Fig-7.



Fig-4.



Fig-8.



Fig-5.



Fig-9.

DISCUSSION

The choice for rehabilitation can be implant supported overdenture, and ridge augmentation but many times the patient who comes with such a problem are geriatric patients with systemic illness, economic constraints, possess reluctance for a long duration treatment procedure and unwillingness for any kind of surgical procedure. Hence, the best way is to rehabilitate them with the conventional way. Apart, from modifying the impression technique to get maximum denture bearing area, modifying the type of denture may also be better accepted by the patient. In general, a conventional (heavy) denture whether maxillary or mandibular is likely to cause poor denture bearing ability. An extensive volume of the denture base material in prosthesis provided to patients with large maxillofacial defects or severe residual ridge resorption is always a challenge to prosthodontists. To increase the retention and stability of heavy prosthesis, many methods have been tried like utilizing the undercuts, modifying the impression technique, use of magnets, use of implants, etc.

Disadvantages of putty Technique

- 1) The difficulty in the removal of putty from the denture base is the main disadvantage. The removal of putty from the anterior region of the denture base is difficult.
- 2) Time-consuming procedure.

Disadvantages of lost salt Technique

- 1) The use of salt crystals alone prevents them to confine to limited space.
- 2) Chances of disruption of salt crystals are more.
- 3) May interfere with polymerization of the heat cure denture base.

The technique described has advantages for hollow denture fabrication

- 1) Leakage and difficulty in gauging resin thickness are problems inherent in. The procedures described in this article overcome these problems.
- 2) The use of silicone putty index in heat cure resin provides a reservoir for salt. This helps in preventing the scattering of the salt on the surface of ridge and heat cure acrylic resin.
- 3) The small window in the cameo surface facilitates removal of salt in an area that is not commonly adjusted after denture insertion.

The advantages of hollow dentures are the reduction in the excessive weight of the acrylic resin, resulting in the lighter prosthesis making the patient more comfortable.

SUMMARY

Hollow maxillary denture is the best method of rehabilitating the patient with severely resorbed ridge and long lip length. It not only reduces the weight of the denture but also the leverage action of the same. This ultimately results in increased retention and stability and

up to some extent, it is also possible to preserve the existing residual alveolar ridge.

Removing silicone putty from the processed denture is difficult and time-consuming. The procedure described in the article overcomes these problems. Reduction in weight of the maxillary denture by making the inner cavity hollow is more useful for severely atrophic maxilla.

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