

## Simplified Approach for Fabrication of Maxillary Hollow Denture

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**Abstract:** The dentist's skill lies in applying the principles of retention, stability and support efficiently in critical situations like atrophic ridges. A severely resorbed maxilla poses a clinical challenge for fabrication of a successful complete denture. This article describes a novel method for fabrication of hollow maxillary complete denture in a patient with resorbed maxillary ridge with increased interridge distance which reduces the weight of the prosthesis and thereby enhances the retention. It includes a laboratory procedure using silicon putty as a spacer to ensure an even thickness of acrylic around the cavity and uses only one flask without fabrication of another heat cure denture base.

**Keywords:** Retention, Stability, Support, Severely resorbed maxillary ridge, Hollow maxillary denture, Silicon putty.

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### I. Introduction

Complete denture treatment for edentulous patients is an age old form of dental treatment. A major problem in dentistry is the prosthetic rehabilitation of deficient edentulous ridges.<sup>1</sup> Residual ridge resorption is a complex biophysical process affected by various anatomic, prosthetic, functional and metabolic factors.<sup>2</sup> Although the resorption process is generally a more serious clinical problem in the mandibular arch, significant loss of alveolar bone in the maxillae can prove equally problematic.<sup>1</sup> The conventional approach may not fulfill the five basic principles of complete denture like retention, stability, support, esthetics and preservation of supporting structures which are of utmost importance for the complete satisfaction of the patient.

Some patients have an atrophic maxillary arch that requires wearing a heavy maxillary denture that may consistently lose its peripheral seal.<sup>1</sup> Reducing the weight of a maxillary prosthesis, however, has been shown to be beneficial when constructing an obturator for the restoration of a large maxillofacial defect. Different approaches like using a solid 3-dimensional spacer, including dental stone<sup>6-7</sup>, cellophane wrapped asbestos<sup>12</sup>, silicone putty<sup>8-10</sup>, or modelling clay have been used during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis.

This article describes a simple, effective and time saving technique for the fabrication of a hollow maxillary complete denture using silicon putty in a patient with resorbed maxillary ridge and increased interridge distance.

### Technique

1. Make a definitive impression of the maxillary residual alveolar ridge and fabricate the denture to the trial denture stage. (fig.1&2)
2. Process the trial denture in the standard manner through the wax elimination stage. (fig.3)
3. Mix and pack the heat cure acrylic resin of approximately 2 mm on acrylic teeth in counterflask with digital pressure.
4. Mix and roll the vinyl polysiloxane putty (Photosil-soft putty, DPI) on glass slab to the approximate size and shape of the arch form. Reduce the excess polymerized putty with a bur to leave 2-3 mm of space from the mold. Fix the putty to the acrylic resin using cyanoacrylate in three regions viz., two posterior and one in anterior region. (fig.4)
5. Apply 0.001 inch tinfoil on putty (fig.5), after that adapt 2 layers of baseplate wax (ProDentModelling Wax) over the tinfoil conforming to the ridge area only (fig.6). Verify complete closure of the flask. If the flask is not closed completely, remove the wax and tinfoil and trim the vertical height of putty until the complete closure of flask. (fig.7&8)
6. After verification of flask closure, remove tinfoil and wax placed. Pack acrylic resin over putty and process. Recover the processed denture in the usual manner after curing.

7. Cut 2 openings with a bur into the denture base distal to the posterior most teeth. Remove the silicone putty by scraping with a sharp instrument. Widen the openings as necessary, laterally, to facilitate access. After removing the putty, clean and disinfect the cavity and seal the distal opening using clear autopolymerizing resin.(fig.9)
8. Polish the denture in the usual manner. Verify that the cavity is sealed by immersing the denture in water. If no bubbles are evident, an adequate seal is confirmed.(fig.10)



**Fig. 1**



**Fig. 2**



**Fig. 3**



**Fig. 4**



**Fig. 5 Fig. 6**



**Fig. 7**



**Fig. 8**



**Fig. 9**



**Fig. 10**

## **II. Discussion**

The technique described here has the advantage over other techniques for hollow denture fabrication. Fattore et al<sup>1</sup> 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<sup>8</sup> processed a shim of acrylic resin over the residual ridge and used a spacer. The resin was indexed and the second half of the denture processed against the spacer and shim. The spacer was then removed and the 2 halves luted with autopolymerized acrylic resin using the indices to facilitate positioning. O'Sullivan et al<sup>5</sup> used double flask technique and silicone putty to develop a cavity within the denture base.

The primary disadvantages of such techniques are leakage along the junction between the 2 previously polymerized portions of the denture, difficulty in gauging resin thickness in cope area and time consuming double flask technique.<sup>1-5-8</sup> The technique described in this article overcomes these problems. This method follows packing of 2mm heat cure acrylic resin in counterflask at dough stage, followed by placement of silicon putty roll over it. Tin foil and 2 mm baseplate wax confirm the even thickness of denture base before packing stage, allowing recontouring of the putty if required. Silicone putty is used as a spacer because of its advantages including its stability, its ability to be carved, and the fact that it does not adhere to acrylic resin. The cyanoacrylate bond between the resin and the putty may be easily removed.<sup>10</sup>

## **III. Summary**

A technique for the fabrication of a lightweight hollow denture is described that can be used for selected patients with advanced atrophy of the maxillae where more conventional dentures are either not possible or contraindicated. The technique uses silicon putty as spacer to ensure an even thickness of acrylic around the cavity and uses only one flask without fabrication of another heat cure denture base.

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