



A DEVICEFUL APPROACH OF MANAGING HOLLOW MAXILLARY COMPLETE DENTURE

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ABSTRACT

Retention, stability and support are the most fundamental and basic principles on which the success of an entire denture relies on. However this factor is often compromised in cases of resorption. Residual ridge resorption is the reduction in size of the bony ridge under the mucoperiosteum. The rate of resorption in mandibular arch is at an increased rate as compared to the maxillary arch; but severely atrophic maxillae with large inter-ridge distance often pose a clinical challenge during fabrication of a successful maxillary complete denture because of the increased weight of the denture, retention is compromised. The present article describes a case of a completely edentulous patient who was successfully rehabilitated with a hollow denture where a simple and deviceful technique of fabricating a light-weight maxillary denture. The present article describes a case of a completely edentulous patient who was successfully rehabilitated with a hollow denture where a simple and deviceful technique of fabricating a light-weight maxillary denture was used using the hollow tubing of salivary ejector apparatus to bring the uniform hollowness.

KEYWORDS: Hollow maxillary denture, inter ridge distance, light weight dentures, residual ridge resorption, salivary ejector, suction tube.

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INTRODUCTION

High-degree of resorption of the maxillary denture-bearing area may lead to problems during prosthetic rehabilitation. The pattern of bone resorption seen is due to the narrower, more constricted residual ridge as resorption progresses, decreased supporting tissues, and as a result large interarch space is present between the

maxillary residual ridge and opposing mandibular ridge. Normally 16-20 mm is adequate for accommodation of artificial teeth and because of the sequence and pattern of resorption as the patient ages, excessive interarch space is present, and in such situation the weight of the denture is increased which leads to poor denture-bearing ability of the tissues and lead to decreased retention and resistance.^[1]

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. The same principle was applied for constructing a hollow maxillary or even a mandibular denture.^[1,3] Historically, weight reduction approaches have been achieved using a lot a basic material like solid 3-

dimensional spacer, including dental stone, cellophane wrapped asbestos,^[4] silicone putty^[5,6] or modelling clay^[7,8] during laboratory processing to exclude denture base material for the planned hollow cavity of the prosthesis.

O'Sullivan et al.^[1] technique used putty impression material.

Chaturvedi et al.^[9] used dough of dental plaster – pumice and sugar syrup this dough is brittle and may break during compression molding, it may also absorb monomer.

Shetty et al.^[10] used a denser thermocol which may get displaced during compression molding.

Aggarwal et al.^[11] used lost salt technique. In this technique, the thickness of the hollow part can't be kept uniform; salt may react with heat cured acrylic and will lead to porosity.

This article describes a very simple and innovative technique for fabrication of a hollow maxillary complete denture using the suction tube of salivary ejector apparatus, reinforced with an orthodontic wire to aid in maintaining the uniform cavity and doesn't get compressed or displaced after applying heavy pressure throughout the denture processing time and easy retrieval.

CLINICAL REPORT

A 54-year-old female patient reported to the Department of Prosthodontics for prosthetic rehabilitation of maxillary and mandibular completely edentulous ridges. The medical history was satisfactory and her past dental history revealed that patient has been edentulous since 6 years. Intra-oral examination revealed a severely atrophic maxillary arch and an increased inter-

ridge distance. Labial, buccal mucosa, frenum attachment, hard palate, soft palate and floor of the mouth were normal. Hence, the treatment plan included hollowing the maxillary complete denture and a conventional mandibular denture for the patient.

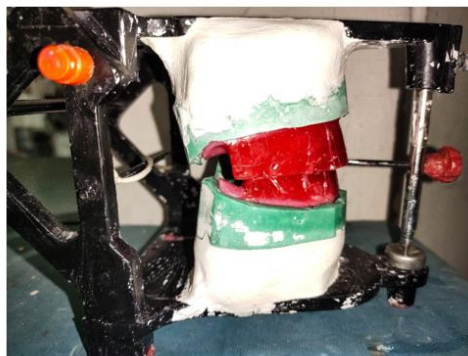


Figure 1: Increased interarch space

TECHNIQUE

1. The maxillary and mandibular denture was fabricated up to the trial denture stage in the conventional manner.
2. After de-mounting the maxillary cast, the total distance available for the hollow space was analysed using a ruler and a divider, keeping the distance from ridge-lap area of tooth to the sulcus depth margin. From the total distance 2 mm thickness of denture base and 2 mm distance from the ridge lap of the tooth is subtracted for considering the strength of the denture. And the available space was considered for hollowing which was around 4mm. [Figure 1]
3. The maxillary denture was processed up to the stage of wax elimination or boil out. [Figure 2]
4. After the de-waxing, modelling wax (Hindustan modelling wax No.2, India) was adapted over the arch, in the same contour of the maxillary

- ridge and checked for available space and trial closure was done.
5. After re-confirming the space available, the suction tube of a salivary ejector apparatus (Indian) was selected and oriented in the shape and size ridge and the hollow



Figure 2: Distance of teeth to 2 mm of wax

- tube was reinforced using an orthodontic 19 gauge wire.
6. Apply cold mould seal (Pyrax Polymars, Roorkee) all over the cast.
7. Now the salivary ejector hollow tubing was stuck using cyanoacrylate directly on the cast. (Figure 3)
8. Now the heat-polymerized PMMA resin material (DPI, Heat cure) was packed with the suction tube in position.
9. Reseat the original cope on the drag and verify complete closure of the flask. Mix, pack, and polymerize the acrylic resin. Recover the processed denture in the usual manner.
10. Cut 2 openings using airtor bur into the denture base distal to the most posterior teeth. Remove the hollow tube using a periodontal probe and pull the suction tube slowly. Widen the openings as necessary, laterally, to facilitate access.
11. Clean and disinfect (Sanmed Strumen G 2.45% instrument disinfectant) the cavity. After



Figure 3 : De-waxing done



Figure 4 : Adapting the suction tube over the cast

removal of the tube and fill the holes using clear autopolymerizing resin.(DPI RR Cold cure)

12. 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. [Figure 4]
13. Denture insertion was done and patient was recalled after 24 hours,1 week and 3 month for follow up.[Figure 5]



Figure 5: Light weight hollow denture.



Figure 6: Post-Insertion (Frontal View)

DISCUSSION

Rehabilitation of patient with severely resorbed ridges, increased interarch space and long lip length is a challenge to the dentist. The choice for treatment depending on the present scenario and long term effectiveness would be an implant supported overdenture, or ridge augmentation but in clinical scenario, many are geriatric patients with systemic chronic illness, economic limitations, possess reluctance for a long duration or an invasive line of treatment.Hence, in these condition, better way is to rehabilitate them with the conventional removable complete denture. The modification within the impression technique to urge maximum denture bearing area, and modifying the

sort of denture can also be better accepted by the patient. [12]

Due to the increase distance between the ridges, the denture thus fabricated is bulky, and poses a problem in retention as well as stability therefore the un-necessary acrylic mass present between the denture base and the teeth arranged can be eliminated and left void, so that a reduced weight denture can be easily fabricated. [13-14]

The method described in this article requires no extra clinical step or armamentarium, it uses the suction tube of the salivary ejector apparatus for getting the uniform cavity desired, since the material is steady enough to take the load of the of the pressure during bench pressing procedure and maintain the cavity throughout the curing procedure. The material can be easily retrieved by using a periodontal probe and pulling it from the sides or even an orthodontic wire can be used.

SUMMARY

An innovative, cost effective approach of using suction tube of the salivary ejector apparatus for getting the uniform cavity required out of the prosthesis and to reduce the unnecessary mass of the acrylic material which would have caused extra weight of the denture. Hollow maxillary complete denture considerably reduces the weight of the prosthesis, which in turn prevents transmission of the detrimental forces, which would otherwise be transmitted from a conventional heavy prosthesis to the underlying tissue and bone. Thus, it helps to preserve underlying tissue and bone and reducing the resorption rate of the bone. [13]

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