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Review Article

A Modified Approach for Controlling the Thickness of Hollow Maxillary Denture

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Abstract: Severe resorption phenomenon with edentulous maxilla may lead to several problems during fabrication of a maxillary complete denture. This often results in a heavy-weighted denture disturbing its retention and stability. This article explains a modified approach for controlling the thickness while hollowing maxillary denture. This hollowing method helps in reducing the weight of maxillary prosthesis, thereby enhancing the comfort, retention and stability.
Keywords: Complete denture, hollow maxillary denture, resorption

INTRODUCTION

Extreme resorption may result in a narrow and constricted maxillary arch, reduced denture-bearing area, and an increased inter-ridge distance. These physiological alterations can develop several difficulties during fabrication of a maxillary complete denture. The success of a complete denture always relies on the principles of retention, stability, support and esthetics[1,2]. The Prosthodontist's skill lies in applying these principles efficiently. In critical situations like severely resorbed maxillary edentulous ridges, slumped facial musculature, or maxillary defects, the weight of the prosthesis generally prolongs the rehabilitation process. Prosthetic rehabilitation of such patients should not just be confined to fabrication of prosthesis, but it should aim to have the minimum possible weight, so that it is comfortable to the patient apart from affecting the other principles of retention. In order, a modified approach has been described that hollows out the prosthesis.

Numerous researchers[3, 4] have documented different methods of hollowing maxillary and/or mandibular dentures. But, the major drawback of these methods was that the junction between the two previously cured parts of the prosthesis displays at the borders. This junction led to seepage of fluid into the hollow cavity and becomes a common site for post insertion adjustment increasing the future chances of fluid leakage. Also, the proper thickness of resin mass cannot be limited while following such methods. In other studies[5-7], silicone putty was recommended as a spacer for hollowing the dentures. However, its removal after denture processing was quite difficult, especially from anterior hollow chamber. Besides this, the openings made for its retrieval had to be large enough to remove the stiff putty.

This article describes a modified approach for hollowing maxillary complete denture prosthesis using a soft soap to form a cavity within the denture base. Soap is easily available and cheaper compared to the previously used spacer material. It is socked in water after which it becomes soft.

TECHNIQUE

1. Finish the routine steps towards conventional denture fabrication such as obtaining a final impression and fabricating a trial denture.
2. A conical bur (416/060; JOTA AG, Switzerland) is used to create an index on the land area of the master cast. After this, the sealing of the trial denture to the cast is completed.
3. This trial denture is duplicated by using an irreversible hydrocolloid impression material (Vignette, Dentsply, India) and a duplicated cast is poured in dental stone (Gold Stone, Asian Chemicals, India).
4. A clear template is produced on this duplicated cast using a 0.3 mm thermoplastic sheet (GB060, Easy-Vac Gasket, Korea).
5. The trial denture is invested into flask and referred as cope and the counterflasking of it in the conventional way is referred to as first drag [Figure 1]. Dewaxing process is then followed. The retrieved record base is adapted again to the master cast and the borders sealed. This is

going to maintain the proper thickness of record base providing enough room for hollowing.

6. This record base is invested in other flask referred as second flask and the wax elimination step is proceeded routinely[8].
7. The heat-curing acrylic resin (Lucitone 199; Dentsply, York Division) is packed into the cope and second drag and polymerization process carried in the conventional manner[8].
8. The cope is removed from the second drag and the clear template is kept on the master cast by following the indices on the land area of the cast.
9. An endodontic file was employed to verify the available space between the template and the denture base [Figure 2].
10. Soft soap (Lifebuoy, Hindustan Unilever Limited, India) was cut, wrapped with small piece of paper, to prevent it from sticking to the resin, which was placed over permanent denture base. Make sure that 1 mm of an additional space exists over the tooth portion of the denture [Figure 3].
11. The template is removed to cut the excess of soap wherever required. A sharp scalpel blade or paper cutter can be used for this purpose [Figure 4].
12. The original cope is placed onto the first drag and the heat-curing acrylic resin (Lucitone 199; Dentsply, York Division) is packed in the routine fashion[8].
13. The denture fabrication is processed and retrieved for the further steps like finishing and polishing. Afterward, laboratory remounting and occlusal adjustments can be done if required[8]. Two openings were created into the posterior parts of the denture base for removal of spacer [Figure 5].
14. Soap spacer is removed with the help of hot water filled in the disposable plastic syringe. The hollow cavity is then cleaned and disinfected with a suitable disinfectant (Cidex OPA, Advanced Sterilization Products, Johnson and Johnson Medical, Skipton, UK). The openings were packed with self-curing acrylic resin (Trevalon, Dentsply India Pvt. Ltd., Gurgaon, India).
15. The denture was polished in the conventional way and the seal was confirmed by immersing it in water filled beaker [Figure 6]. The denture was then delivered to the patient with proper instructions[8].

Fig-1: Flasking of trial maxillary denture sealed to indexed definitive cast

Fig-2- Clear template adapted to indexed definitive cast and an endodontic file used to control the thickness of acrylic resin dough.

Fig-3: check clearance of 1mm with clear template

Fig-4: Soap wrapped in paper placed on permanent denture base

Fig-5: Finished and polished maxillary denture with openings prepared to facilitate removal of soap

Fig- 6: Processed denture immersed in water to check for adequate seal

DISCUSSION

The modified approach described provides several benefits when compared to previously documented methods for hollowing maxillary prosthesis[3, 4, 9-11]. In previous methods, seepage of fluid and difficulty in measuring resin thickness were the prime drawbacks[1, 3-7, 12-21]. In some studies[9-11, 22], silicone putty has been advised to be used as a spacer for hollowing the denture. But the major disadvantage of this method was difficulty in retrieving putty from the anterior zone of hollow cavity. The soap spacer used in this technique overcome the several problems associated with previous methods of hollowing denture. Reduction in fluid seepage at the junction of assembled parts of the denture is the main benefit of this technique. The small openings created into the denture base distal to the posterior teeth facilitate retrieval of the soap in an area that is not usually adjusted after denture placement. The thickness of the resin is well controlled through the use of soap . This ensures an even depth of resin material to prevent fluid seepage and prevent deformation during flask closure. A periodontal probe can also be used to verify resin thickness during packing stage. Soap that is used as spacer can be recontoured easily during packing stage if required and can be retrieved easily with hot water dipping through the opening.

SUMMARY

A modified approach for hollowing maxillary denture is described. The approach uses a clear template of the trial denture to facilitate insertion of soap that acts as a spacer. This ensures an even thickness of acrylic resin during packing stage and also resists deformation during flask closure. In addition, this technique prevents fluid seepage into the hollow cavity.

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