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RESEARCH ARTICLE

WEIGHTLESS DENTURES: CASE REPORTS

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ABSTRACT

Severe ridge resorption decreases the success rate of a complete denture by reducing the denture bearing area. The increased interarch space and resultant increased weight of the prosthesis in such cases further adds to the problem. Fabricating a hollow denture to reduce the weight of the prosthesis is beneficial in such cases. In this article, three case reports have been described where completely edentulous patients with increased interarch space were given hollow denture made by three simple techniques.

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INTRODUCTION

Principles of retention, stability and support play a very crucial rule in the success of complete denture prosthesis. Patients who have remained edentulous for a very long time often report with severe residual ridge resorption. Rehabilitation in such patients is a big challenge for a prosthodontist as conventional denture if given in such cases does not fulfil the above three principles. Also, increased interarch space seen in such patients increases the weight of the conventional denture which further compromises the retention (Negi, 2014). Choice of rehabilitation in such patients can be implant supported over denture and ridge augmentation procedure. But these procedures cannot be implemented in every case due to illness or economic problems (Naik *et al*., 2015). Also, patient may not be interested in any kind of surgical procedure. Thus, the dentist is left with option to do modification in the conventional denture. To maintain the retention of the prosthesis, it has been suggested to reduce the weight of the prosthesis as the dislodging factors of maxillary denture are weight and gravitational force (Naik *et al*., 2015). In this article, three case reports have been described. In all the cases, patients reported to the Department of Prosthodontics with the chief complaint of all missing teeth and replacement of the same.

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They had remained edentulous for a 7-9 years and their intraoral examination showed ridges with severe resorption. The interridge space was found to be increased with 26, 24 and 27 mm respectively. All the patients were old denture wearer and demanded dentures which will not only improve their masticatory function but will also be light weight. Thus, hollow denture was planned for the patient to decrease the weight of the prosthesis. The clinical procedures upto trial was same in all the three cases with the difference only in the lab procedures.

CASE REPORT 1- Use of thermocol as spacer

- For making hollow maxillary denture, a set of two interchangeable flasks were arranged after which the trial denture base was invested and dewaxing was done (Figure 1).

- A sheet of modeling wax was adapted over the maxillary cast and processed in heat cure resin using an interchangeable second flask. This permanent record base was left undisturbed on the master cast (Figure 2). Then, a piece of thermacol was tried for the amount required by placing it over the maxillary teeth and then closing the flask (Figure 3). It was then crushed and mixed with glue. This mix was applied over the permanent record base using an old toothbrush.

Fig. 1. Flasks after dewaxing of trial denture base

Fig. 2. Processed record base using interchangeable flask

The original flask with denture teeth was packed with heat polymerizing resin and placed over the flask with maxillary cast and permanent record base. After bench pressing, curing was done according to short curing cycle.

Fig. 3. Piece of thermocol placed over maxillary teeth to check for the required amount

- After deflasking, denture was finished, polished and inserted (Figure 4).

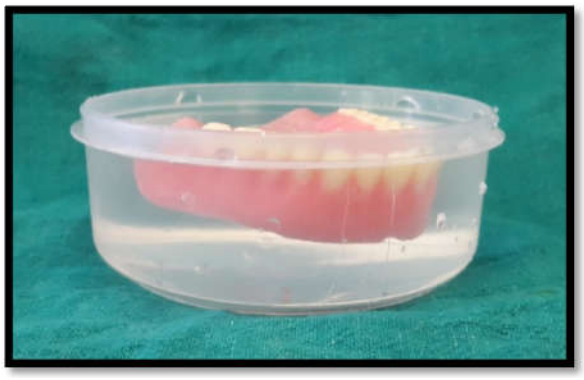

Fig. 4. Finished light weight maxillary denture

CASE REPORT 2 – Use of salt as spacer

- After flasking and dewaxing, separating medium was applied and half of the heat cure acrylic resin (DPI) was placed over the dewaxed mould in dough consistency. Thereafter, salt was placed on the packed resin on the ridge area and then the remaining heat cure resin was packed (Figure 5 and 6). After bench pressing, curing was done. The cured denture was retrieved and finished.

Fig. 5. Salt placed on the first layer of heat cure resin

Fig. 6. Second layer of heat cure resin packed

- After finishing, two escape holes were made with round bur on the polished surface of the denture, posterior to the second molar. Through these holes, hot water with syringe in high pressure was injected to remove all the salt, thereby creating a hollow cavity (Figure 7).

Fig. 7. Maxillary denture with holes to flush out salt with hot water

- The escape holes were then closed with autopolymerizing resin (DPI) and the dentures were polished in the regular manner.

CASE REPORT 3 – Use of ice as spacer

- After dewaxing, to get the idea of the desired amount of space available for ice, wax layer was adapted on the buccal and palatal side of the teeth in the flask which were joined together in the tuberosity area. Another layer of wax was adapted covering the teeth area such that a hollow cavity of U shape was formed (Figure 8). The flask was then closed to check whether wax interfered with the flask closure.

Fig. 8. Mould of wax made for ice spacer

- This cavity was removed and filled with water (Figure 9) which was then refrigerated to allow the formation of ice (Figure 10). Once the ice was formed, wax sheet around the boundary was removed to get U shaped ice.

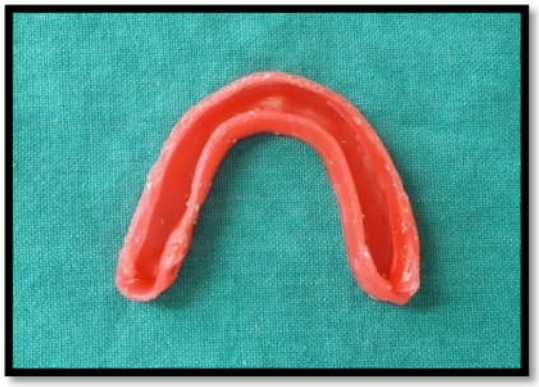

Fig. 9. Mould of wax filled with water

Fig.10. Ice spacer

- A layer of heat cure resin was packed on the tooth side. Then, U shaped ice was placed on the packed resin on the ridge area carefully after which the remaining heat cure resin was packed. After bench pressing, curing was done. After deflasking, the cured denture was finished.

Fig. 11. Ice spacer placed on heat cure resin

DISCUSSION

Rehabilitation of severely resorbed ridges with increased interarch space is a challenge to a prosthodontist. Even though, the choice of rehabilitation can be implant retained overdentures and ridge augmentation, many a times the patients who come with such problem are geriatric patients with systemic illness or who are not willing to undergo any surgical procedure (Naik *et al*., 2015). Thus, the best way in such patients for rehabilitation is conventional denture fabricated with modified processing technique. In the past, various methods have been used to fabricate a hollow denture. Materials like solid 3 dimensional spacer, silicone putty (Holt, 1981; Jhanji, 1991; Kaira *et al*., 2013), modelling clay (DaBreo, 1990; Elliot, 1983) or cellophane wrapped asbestos (Worley, 1983) have been used to make a hollow cavity in the denture[1]. Holt *et al*. (1981) processed a shim of acrylic resin over the residual ridge and used a spacer. The resin was indexed and second half of the denture was processed against the spacer and shim. This spacer was then removed and the two halves were luted with autoploymerizing resin. As the junction between two portions of the denture occurs at the borders of the denture, there was a increased risk of seepage of fluids into the denture cavity with this technique. Fattore *et al*. (1988) fabricated hollow denture by adding heat cure acrylic resin over the definitive cast and processing a minimal thickness of acrylic resin around the teeth using a different drag. Both the portions were then attached using a heat cure resin. O'Sullivian *et al*. (2004) used silicone putty as spacer which was later removed by making openings at the distal end of the denture. But, removal of putty is a tedious procedure especially from the anterior region. In this article, three simple techniques have been discussed. The first technique used thermocol as the spacer material which can be left in the denture after processing. Thus, the tedious task of removing the spacer is avoided.

The second technique used salt crystals which were later removed by flushing hot water into the openings. Salt used as a spacer material has the advantage of being readily available and being cheap and easy to use. But the operator need to carefully place the salt over the packed resin only in the required area avoiding spillage as spillage if occurred may be seen in the cured denture as white spots which will be a tedious task to remove.

The third technique used ice which is again easy to use and readily available. The only disadvantage with this technique is that the ice may melt during the packing procedures due to the exothermic reaction that occur during the polymerization of the resin. Thus, the procedure of packing the resin has to be done quickly to avoid melting of the ice before complete packing. All the techniques described in this article are simple to execute and effective in making the denture light weight with the thermocol technique showing the best results.

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