

Rehabilitation of atrophic maxilla with a hollow maxillary complete denture: A case report

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ABSTRACT

Residual ridge resorption is the reduction in size of the bony ridge under the mucoperiosteum. The rate of resorption is more in mandibular arch as compared to the maxillary arch; but severely atrophic maxillae with large inter-ridge distance often pose a clinical challenge during fabrication of complete denture due to decreased support, retention and stability. This clinical report describes successful rehabilitation of a completely edentulous patient with atrophic ridges using hollow maxillary complete denture.

Key words: Hollow maxillary denture, increased interridge distance, residual ridge resorption

INTRODUCTION

Extreme resorption of maxillary denture bearing area may lead to problems with prosthetic rehabilitation because the ridge becomes narrow, constricted and a further increase in the restorative space between the maxillary and mandibular residual ridges. This results in a heavy maxillary denture that may further compound the poor denture bearing ability of the tissues and lead to decreased retention and resistance.^[1]

To decrease the leverage, reduction in the weight of the prosthesis was recommended. Reducing the weight of the maxillary prosthesis has been shown to be beneficial when constructing an obturator for the restoration of a large

maxillofacial defect.^[2] Given the extensive volume of the denture base material in prostheses provided to patients with large maxillofacial defects or severe residual ridge resorption, reduction in prosthesis weight may be achieved by making the denture base hollow.^[3,4]

CASE REPORT

A 55-year-old male patient reported to the Department of Prosthodontics with a chief complaint of fractured maxillary denture and desired the replacement of the same. Medical history revealed that the patient was a diabetic and on oral hypoglycemic agents with well-controlled blood glucose levels. Past dental history revealed that patient was a complete denture wearer since 3-4 years.

On intraoral examination, maxillary and mandibular edentulous ridges were severely resorbed with excessive inter-ridge distance. No other clinical abnormalities were seen. The possible treatment options were,

1. Conventional complete dentures,
2. Implant supported complete dentures and
3. Hollow maxillary denture and conventional mandibular dentures.

These treatment modalities were discussed in detail with the patient. After careful analysis and patients' approval the decision of fabrication of maxillary hollow dentures and conventional mandibular dentures was made.

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The primary impressions were made using impression compound followed by definitive impressions. Dentures were fabricated to the trial denture stage.

Mandibular denture was fabricated in the conventional manner. Hollow maxillary denture was constructed using a dental flask with two interchangeable lids. The denture was flasked, de-waxed and separated [Figure 1]. A wax shim (2 mm thickness) was placed covering the maxillary denture teeth area and palatal area [Figure 2]. Apply the separating media over the plaster and complete flasking using the second lid of the flask. The first lid along with the denture base was not flasked [Figure 3]. Then the dewaxing, packing and processing were completed in the usual manner. The second lid was removed after processing and the first lid was replaced with the help of orientation notches. The two halves were fitted together to remove any acrylic resin that would interfere with complete flask closure. The two parts were then fused with self-polymerizing acrylic resin. The denture was de-flasked and finished. The denture was floating [Figure 4] when tested for a complete seal by immersing in water. They were evaluated for any fluid seepage into the denture cavity by



Figure 1. De-waxed flasks

weighing it before and after placement in water for a day. Once the seal was evaluated, the dentures were inserted in the patient's mouth.

The patient was reviewed after a week and minor problems were corrected. The patient was comfortable with dentures. And, thereafter the patient was scheduled for his routine dental recall.

DISCUSSION

Conventional dentures fabricated on severely resorbed residual ridges are unstable, non-retentive and inefficient. Although, the choice for rehabilitation can most likely be implant supported overdentures and ridge augmentation but only a few patients are provided with this. The reasons could be geriatric patients with systemic illness, financial constraints, reluctance for surgical procedures, unwillingness to undergo long treatment procedures etc. Therefore, they are rehabilitated with conventional prosthesis. Modification can be made to the conventional dentures in addition to the modification of impression



Figure 2. Wax shim

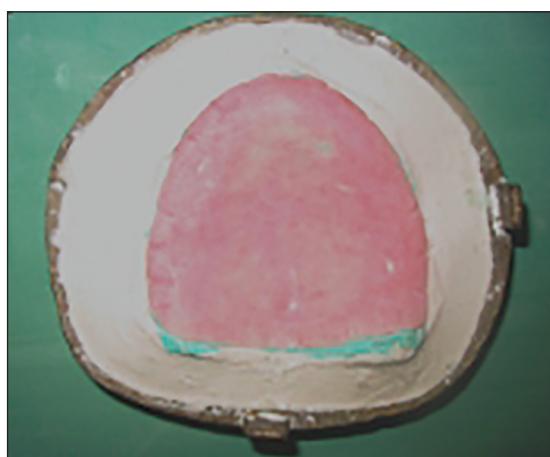


Figure 3. Denture base

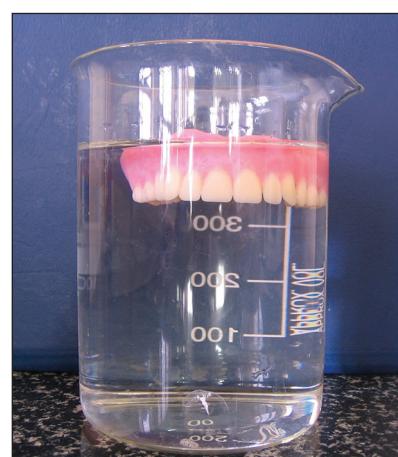


Figure 4. Hollow dentures

techniques.^[5] A light weight maxillary complete denture was planned to counteract the lateral forces better and decrease the leverage. However, a conventional mandibular denture was fabricated as it has been suggested, though universally not accepted, that gravity and addition of weight to the mandibular complete denture may aid in retention of the prosthesis.^[1]

Various weight reduction approaches have been achieved using a solid three-dimensional spacer, including dental stone^[6] cellophane wrapped asbestos,^[7] silicone putty or modeling clay^[8] during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis.

The hollow maxillary complete denture was fabricated using the two-flask technique described by Fattore *et al.*,^[9] which was a variation of the technique originally described by Chalian and Barnett^[10] for fabrication of hollow bulb portion of obturator prosthesis using autopolymerized acrylic resin shims. The technique of using a flask with two interchangeable lids and wax shim was very convenient for the fabrication of hollow maxillary denture. However, the fusing of two parts without any discrepancy can sometimes be difficult to achieve.

CONCLUSION

One of the common challenges encountered by prosthodontists is the prosthetic rehabilitation of an individual with atrophied edentulous ridges. The technique of using interchangeable lids and wax shim for fabrication of hollow dentures was chosen as an attempt to make the lab procedure simpler and restore

the patient with a stable prosthesis. The reduced denture weight provides comfort to patient, thereby improving the quality of life.

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