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CLINICAL REPORT

Hollow Maxillary Complete Denture

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Abstract Residual ridge resorption is the reduction in size of the bony ridge under the mucoperiosteum. The resorption occurs at a faster rate in mandibular arch as compared to the maxillary arch; but severely atrophic maxillae with large interridge distance often pose a clinical challenge during fabrication of a successful maxillary complete denture. This clinical report describes a simple technique of fabricating a hollow maxillary complete denture in a patient with resorbed maxillary and mandibular ridges with increased interridge distance which reduces the weight of the prosthesis and thereby enhances the retention.

Keywords Hollow maxillary denture · Light weight prosthesis · Residual ridge resorption · Increased interridge distance

Introduction

The severely atrophic maxilla poses a clinical challenge for fabrication of a successful complete denture. In addition to this increased interridge distance often results in heavy maxillary complete denture that further reduces the retention of the prosthesis. Reducing the weight of a maxillary prosthesis has been shown to be beneficial when constructing an obturator for the restoration of a large maxillofacial defect [1, 2,]. It has also been proved that prosthesis weight can be reduced by making the denture base hollow. Different approaches like using a solid 3-dimensional spacer, including dental stone [3–7], cellophane wrapped asbestos [8], silicone putty [9, 10], or modelling clay have been used during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis. Fattore et al. [4] and Holt [9] have used different techniques for fabricating a hollow prosthesis. The primary disadvantage of such techniques is that the junction between the two previously polymerized portions of the denture occurs at the borders of the denture which increases risk of seepage of fluid into the denture cavity. Furthermore, this junction is a common site for post insertion adjustment increasing the risk of leakage. Another disadvantage is that it is difficult to gauge resin thickness in the cope area. This clinical report describes a technique for fabrication of a hollow maxillary complete denture in a patient with resorbed maxillary and mandibular ridges and increased interridge distance.

Clinical Report

A 56 year old male patient reported to the Department of Prosthetic Dentistry of VSPM's Dental College and Research Centre, Nagpur for prosthetic rehabilitation of maxillary and mandibular edentulous ridges. Past medical history was not relevant. Past dental history revealed that patient was a denture wearer since 3–4 years and the maxillary dentures were loose.

Intraoral examination revealed severely resorbed maxillary and mandibular edentulous ridges with increased interridge distance (Fig. 1a, b). Labial, buccal mucosa, hard palate, soft palate and floor of the mouth were normal. Hence, hollow maxillary complete denture and conventional mandibular denture was planned for this patient.

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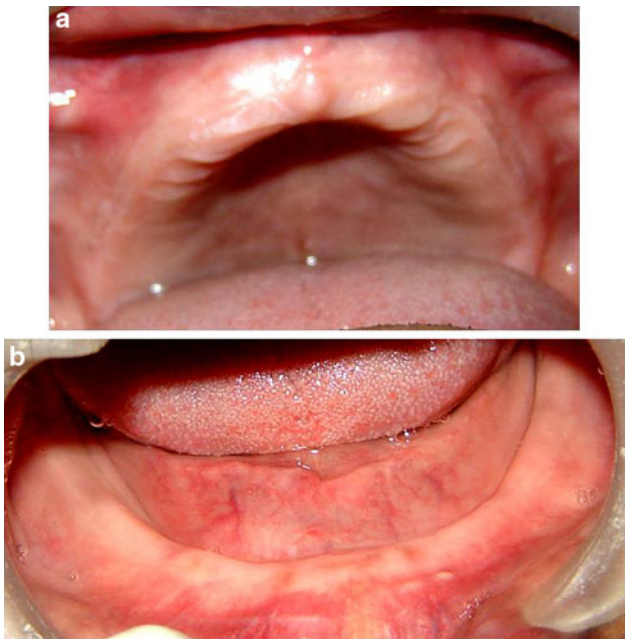

Fig. 1 **a** Resorbed maxillary edentulous ridge. **b** Resorbed mandibular edentulous ridge

Technique [11]

1. The maxillary denture was fabricated up to the trial denture stage in the conventional manner.
2. The land area of the cast was indexed using a conical bur and the trial denture was sealed to the definitive cast (Fig. 2). The trial denture was duplicated in reversible hydrocolloid and poured in dental stone. A template of the duplicated trial denture was made by adapting 0.5-mm thermoplastic sheet (Duran 0.5 × 125 mm, code 111; Libral Traders Pvt. Ltd., New Delhi.) on the recovered cast using vacuum heat-pressed machine (Biostar) (Fig. 3).

Fig. 2 Trial maxillary denture sealed to indexed definitive cast

Fig. 3 Template adapted on duplicated trial denture cast

3. The trial denture was then processed in the standard manner up to the wax elimination stage.
4. Two layers of baseplate wax were adapted to the definitive cast in the drag, conforming to the border extensions (Fig. 4a). A second flask was used to invest

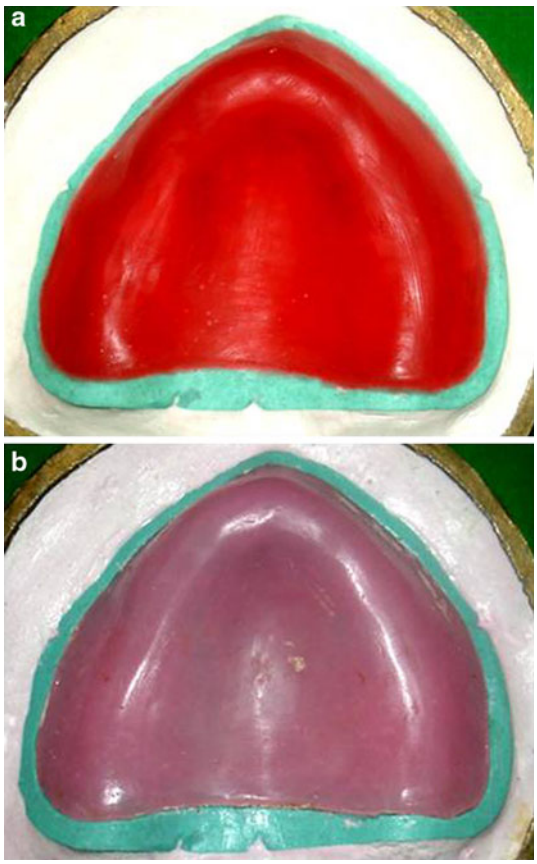

Fig. 4 **a** Baseplate wax adapted on the stone cast. **b** Processed heat cure record base

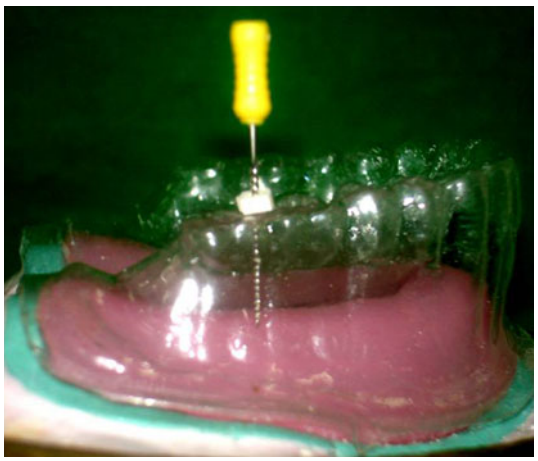

Fig. 5 File used to measure the space between matrix and base

Fig. 6 Putty adapted and shaped to approximate contours of matrix

this baseplate wax and processed in conventional manner (Fig. 4b).

5. After deflasking the clear matrix was placed on the definitive cast using the indices in the land area as seating guides. An endodontic file with a rubber stop was used to measure the space between the matrix and the processed base (Fig. 5).
6. Vinyl polysiloxane putty [Aquasil, Dentsply Corporation, Germany] was mixed and adapted on the base and shaped to the approximate contours of the matrix (Fig. 6). The polymerized putty was shaped with a bur to leave 2–3 mm of space between the putty and matrix. An additional 1 mm space was provided over the tooth portion of the denture. The putty was fixed to the base using cyanoacrylate.
7. The original cope was reseated on the drag and verified for complete closure of the flask. Then acrylic resin was packed over putty and processed. The processed denture was recovered in the usual manner.

Fig. 7 Maxillary denture with openings

Fig. 8 The completed prosthesis

8. After finishing the denture two openings were cut with a bur into the denture base distal to the most posterior tooth. The silicone putty was removed using a sharp instrument and thick orthodontic wire. The openings were widened as necessary, to facilitate access (Fig. 7). After complete removal of putty, two covers were fabricated using clear autopolymerizing resin. The clear resin covers were attached using autopolymerizing resin.
9. The denture was polished in the usual manner and the seal was verified by immersing the denture in water. (air bubbles should not be evident after immersing the denture in water) (Figs. 8, 9).

Discussion

This technique overcomes the disadvantages of the older techniques. Problems with leakage and difficulty in gauging resin thickness are overcomed. The small window in the cameo surface facilitates recovery of the spacer in an area that is not commonly adjusted after denture insertion and has a small margin along which leakage can occur. The clear resin window allows verification of the integrity of the denture at patient recall. The thickness of resin can be controlled through the use of putty and clear matrix, ensuring an even depth of resin to prevent seepage and

Fig. 9 Patient after insertion of prosthesis

prevent deformation under pressure of flask closure. In this technique silicone putty was used as a spacer because it is stable, it can be carved, and it does not adhere to acrylic resin [10]. The cyanoacrylate bond between the resin and the putty is easily removed.

Indications

1. Resorbed residual ridges.
2. Increased interridge distance.

Advantages

1. Reduces leakage at the junction of the two portions of the denture.
2. Commonly used materials are used for its fabrication.
3. Reduces weight of the prosthesis which in turn enhances retention.

Disadvantages

1. Time-consuming procedure.
2. Hollow denture is prone to fracture.
3. Removal of putty from the cavity is difficult.

Precautions

1. There should be adequate thickness of resin around the cavity.
2. Seal around the window should be perfect and should be checked for leakage.
3. Denture care instructions should be given to the patients.
4. Special instructions regarding handling of the denture should be given as the dentures are prone to fracture.

Conclusion

Hollow maxillary complete denture considerably reduces the weight of the prosthesis which in turn prevents transmission of detrimental forces which would otherwise be transmitted from a conventional heavy prosthesis to the underlying tissues. Thus it helps to preserve underlying tissues and bone. Also the clear matrix of the trial denture helps to facilitate shaping of silicone putty spacer to ensure an even thickness of acrylic to resist deformation and prevent seepage of saliva into the cavity.

References

1. El Mahdy AS (1969) Processing a hollow obturator. J Prosthet Dent 22:682–686
2. Brown KE (1969) Fabrication of a hollow-bulb obturator. J Prosthet Dent 21:97–103
3. Chalian VA, Drane JB, Standish SM (1971) Intraoral prosthetics. In: Chalian VA, Drane JB, Standish SM (eds) Maxillofacial prosthetics: multidisciplinary practice. Williams & Wilkins, Baltimore, pp 133–157
4. Fattore LD, Fine L, Edmonds DC (1988) The hollow denture: an alternative treatment for atrophic maxillae. J Prosthet Dent 59:514–516
5. Gardner LK, Parr GR, Rahn AO (1991) Simplified technique for the fabrication of a hollow obturator prosthesis using vinyl polysiloxane. J Prosthet Dent 66:60–62
6. McAndrew KS, Rothenberger S, Minsley GE (1998) An innovative investment method for the fabrication of a closed hollow obturator prosthesis. J Prosthet Dent 80:129–132
7. Nidiffer TJ, Shipman TH (1957) Hollow bulb obturator for acquired palatal openings. J Prosthet Dent 7:126–134
8. Worley JL, Kniejski ME (1983) A method for controlling the thickness of hollow obturator prostheses. J Prosthet Dent 50:227–229
9. Holt RA Jr (1981) A hollow complete lower denture. J Prosthet Dent 45:452–454
10. Jhanji A, Stevens ST (1991) Fabrication of one-piece hollow obturators. J Prosthet Dent 66:136–138
11. O'Sullivan M (2004) The hollow maxillary complete denture: a modified technique. J Prosthet Dent 91:591–594