

MAXILLARY HOLLOW DENTURE : A CASE REPORT

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Abstract:

Denture esthetics provide confidence and improves social interaction of the patient. Other equally significant principles which enhances comfort and adaptability of the denture wearer are retention, stability and support. Long lip length, severely resorbed ridges with increased inter arch distance, increased weight of maxillary denture are critical situations which leads to a compromised denture retention. Heavy dentures are likely to cause poor denture bearing tissues and constant pressure leads to bone resorption.

Key words: interarch distance, hollow maxillary complete denture, retention, light weight prosthesis

Case Report

A 68 year old male patient reported to the Department of Prosthodontics, PMS College of dental science and research, Vattappara, Trivandrum with chief complaint of difficulty in eating due to loss of teeth. History reveals that the patient lost his teeth due to periodontal reasons.

Various treatment options available for the patient were:

a. Implant supported complete denture

b. Conventional Complete denture

c. Hollow maxillary complete denture and conventional mandibular complete denture

Considering the economic constraints, available interarch space and retention factor, third option was chosen.

Technique

1. Fabricate the denture till the trial denture stage following conventional technique. During jaw relation stage, it was noted that vertical dimension at occlusion (VDO) and vertical dimension at rest (VDR) was more than average. Increased inter arch space and decreased tissue resiliency contributed to increased weight of the maxillary prosthesis and decreased retention. Hence, it was decided to be made hollow.
2. Total height of the trial denture was measured and noted at the region of each of the posterior tooth on either side using metric scale.
3. Trial denture adapted on master cast was duplicated using reversible hydrocolloid to reproduce a working cast on which a thermoplastic resin was adapted. Thermoplastic resin was seated on to the trial denture and

was used to measure the area available to be made hollow. Height of each posterior teeth along with 2mm of shim was marked onto the thermoplastic resin. 2mm thickness of the denture base from depth of the sulcus was also transferred to thermoplastic resin. Area between these markings gave height of the area to be hollowed out. Width of the trial denture was measured at top and bottom markings of hollow space using broad K file pierced through the thermoplastic resin.

Two split dental flasks with interchangeable top halves (B1:T1, T2) was used to construct a hollow

denture. Process the trial dentures in the standard manner till the wax elimination stage using B1:T1. Cold cure denture base after dewaxing sealed to the definitive cast using modelling wax in B1. Investing and dewaxing was done using the counter part of second flask. Pack with heat-polymerized acrylic resin and process using the counter part of the second flask. Separate the counter flask, with the permanent denture bases still attached to the master cast in the bottom half of the first flask. (B1:T2)

[Bottom half of first flask = B1; Top half of first flask = T1; Top Half of second flask = T2]

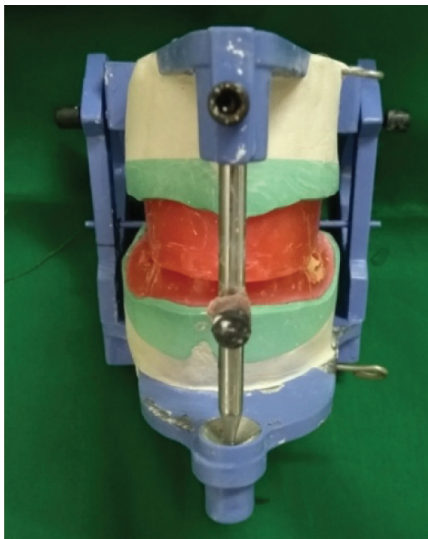


Figure 1

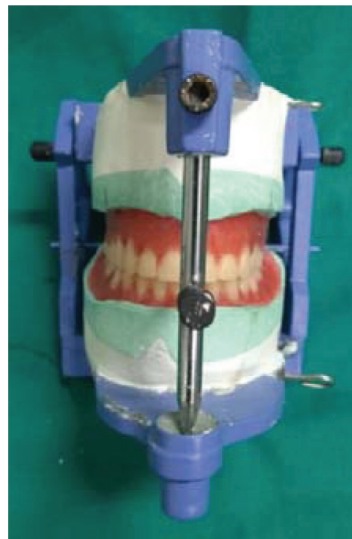


Figure 2

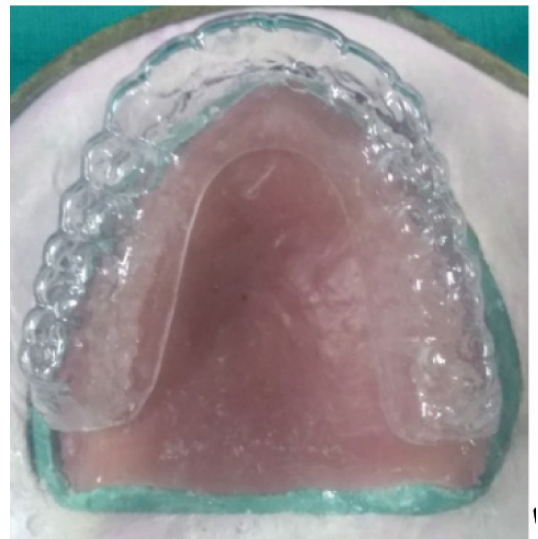


Figure 3

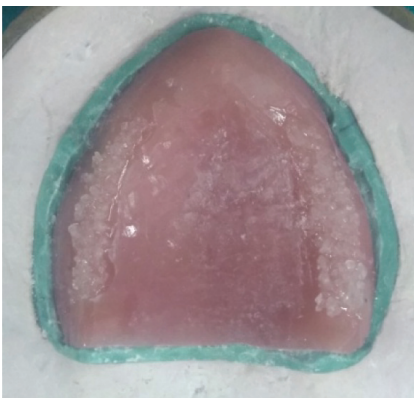


Figure 4



Figure 5



Figure 6

4. Crystal Salt was glued onto the surface of the permanent denture base in the posterior region with the help of markings transferred on to the thermoplastic resin.

5. Heat cure acrylic was packed in the mould space and the original counter part of the flask was used. (B1:T1)

6. The area to be hollowed out was opened with the straight fissure bur and salt was leached out by flushing water into the denture. Once completely hollowed out, the opening at the posterior end was closed with the self cure acrylic.

7. Maxillary denture was placed in water to ensure the reduction in weight.

8. Dentures was then finished and polished.

Conclusion

Two flask technique for fabrication of hollow maxillary denture is described to reduce the weight of heavy maxillary complete denture in cases with severe ridge resorption, greater inter arch space and decreased retention. Hollowing of maxillary denture thus prevents residual ridge resorption, compensates and improves the retention lost due to virtue of its heavy weight

Discussion

Different studies used various solid three dimensional spacer for weight reduction, including dental stone (Ackermen, 1955), cellophane, insta mold silicone putty (Holt 1981)¹, wrapped asbestos (Worley & Kniejski, 1983), silicone putty (Holt 1981) or modelling clay (DaBreo, 1990) for incorporating hollow cavity in the prosthesis.

In 1988, Fattore et al² adopted a method inspired from the well-known double-flask technique described by Chalian and Barnett for the fabrication of the hollow bulb obturator. It resulted in 2 processed acrylic resin shell leaving a hollow

space in between, which was later joined by acrylic. Sullivan et al³ used a clear matrix of the trial denture and silicone putty spacer adapted onto it to obtain the outline of hollow space. Once the spacer was retrieved, the hole was sealed using autopolymerizing resin or light-polymerizing gel. This method ensured an even thickness of acrylic to resist deformation and prevent seepage of saliva into the cavity.

A study conducted by Ohkubo et al 1999⁴ compared the jaw movements and denture retention, stability, and comfort of heavy and light weight mandibular complete dentures and concluded the weight of a well adapted tissue fitting mandibular complete denture did not affect jaw movements, denture stability, or patient preference. When weight was added to the mandibular denture, immediate change was observed in the mandibular rest position slightly downward and backward, but it returned to its original position later.

Recent studies by Vadhvani P et al (2012)⁵ used Dough of Dental Plaster-Pumice & Sugar syrup, Bhandari A et al(2013)⁶ plaster pumice mix between the buccal and palatal wax sheet, Sharma R et al (2014)⁷ plaster pumice mix as spacer along the vacuum formed sheet and endodontic file to assess hollow space, Patil PR et al(2015)⁸ modelling wax enclosed in layer of self cure acrylic, Qanungo A et al(2016)⁹ used glycerine soap, Fulari DS et al (2016)¹⁰ surgical catheter with 19 gauge orthodontic wires and Shetty V et al(2018)¹¹ incorporated thermocol as spacer which was left inside after processing.

The technique used in current study facilitate better visibility, assessment and execution of the space to be hollow. However, the small window in the cameo surface in the previous technique has potential for leakage between the heat polymerized resin and auto polymerized resin portions. Incomplete retrieval of hollowing material is also another disadvantage.

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