A Hollow Maxillary Complete Denture for Rehabilitation of Severely Resorbed Maxillary Ridge : A Case Report

Aggarwal A[1], Sharma A[2], Jayna A[3], Deol S[4]

Abstract

The basic principle for the success of complete denture lies on retention, stability & support. The severely resorbed maxillary denture bearing area poses a clinical challenge for successful prosthetic rehabilitation. This article presents a case report of a severely resorbed maxillary ridge with increased interarch space treated with a hollow maxillary denture.

Keywords: Complete Denture, Hollow Maxillary Denture, Light Weight Denture, Inter ridge Distance.

Introduction

Prosthetic rehabilitation of deficient edentulous ridges is a major problem in dentistry. Residual ridge resorption is a continuous process. Although resorption is more serious clinical problem in the mandibular arch, significant loss of alveolar bone in the maxillae can be equally problematic. Fabrication of successful complete denture prosthesis is the dentist's responsibility by incorporating various factors enhancing retention, stability and support. As resorption progresses, the maxillary arch becomes more narrower, more constricted with decreased supporting tissue, as a result there is large restorative space between the two ridges. Fabrication of complete denture in such cases result in a heavy maxillary denture, which can lead to poor denture bearing capacity i.e. decreased retention and resistance. This problem can be overcome by reducing the weight of maxillary denture, by making it hollow.

It has been suggested that gravity and the addition of weight to the mandibular complete denture may aid in prosthesis retention.[1,2] However, reducingweight of a maxillary prosthesis has been beneficial when an obturator is constructed for restoration of large maxillofacial defect.[3,4] Historically, various approaches have been described for achieving weight reduction in maxillary denture during laboratory processing by excluding denture base material from the planned hollow cavity of the prosthesis. For example: use of a solid 3-dimensional spacer, like dental stone,[5,6] cellophane wrapped asbestos[7], silicone putty[8], or modelling clay[9].

Holt[9] used a spacer and processed a shim of acrylic resin over the residual ridge, the two halves luted together. Fattore et al[10] fabricated an obturator by using a variation of the double flask technique. He added heat polymerized acrylic resin over the definitive cast and also processed minimal thickness of acrylic resin around the teeth using different drag. Both

Corresponding Author : Dr Anju Aggarwal, Senior Lecturer, Dept Of Prosthodontics, ITS Dental College, Hospital And Research Centre, Greater Noida. **(M)** 8800201519 **E-mail :** aries15dranju@yahoo.co.in.

1. Senior Lecturer, Dept of Prosthodontics I.T.S. Dental College, Hospital And Research Centre, Greater Noida.
2. Professor & Head, Dept. of Prosthodontics I.T.S. Dental College, Hospital And Research Centre, Greater Noida.
3. Professor, Dept. of Prosthodontics I.T.S. Dental College, Hospital And Research Centre, Greater Noida.
4. PG Student , Dept of Prosthodontics I.T.S. Dental College, Hospital And Research Centre, Greater Noida.

portions of resin were then attached using a heat polymerized resin. O'Sullivan et al[11] used silicon putty as spacer. A clear matrix of the trial denture base was made, which was then invested in the conventional manner and wax elimination was done. A 2mm thick heat polymerized acrylic shim was made on the master cast, using a second flask. Silicone putty was placed over the shim and its thickness was estimated using a clear template. The original flask with the teeth was then placed over the putty and the processing was done. The putty was later removed from the distal end of the denture and the openings were sealed with autopolymerising resin.

This article describes a technique for the fabrication of a light weight hollow denture using double flask technique.

Case Report

A 55year old female patient reported to the Department of Prosthodontics, with the chief complaint of missing upper and lower teeth and wanted the replacement of the same. On examination, it was found that both the upper and lower arches were completely edentulous and severely resorbed, with increased interarch space. For the rehabilitation of patient it was decided to fabricate hollow maxillary complete denture and conventional mandibular denture.

Technique:-

1. Preliminary and final impressions were made in conventional manner using impression compound and zinc oxide eugenol respectively. The wax record rims were fabricated and jaw registration was carried out, that suggested out that there is more than normal interarch space(freeway space). Teeth were arranged and try in was done.
2. Following satisfactory wax try in, the dentures were processed using double flask technique. Two interchangeable flasks were selected, which were used for making hollow maxillary denture.
3. Trial dentures were flasked in conventional manner. Wax elimination was done and residual wax was properly cleaned.
4. Thick sheet of wax was adapted over the maxillary cast. A sheet of wax was also adapted on the cope (cavity side) of the flask consisting of the teeth. Ensuring that flask closed completely with wax in place. The hinderances to closure were trimmed out.(figure-1)

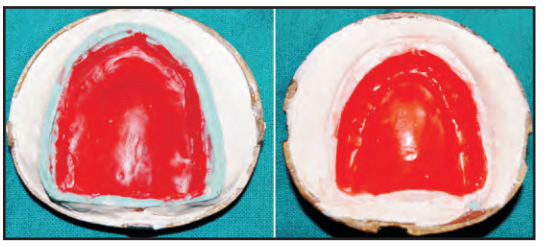

Figure-1- wax adapted over two parts of denture

5. Now the cope and the base part were flasked separately using parts of interchangeable flask.(figure-2)

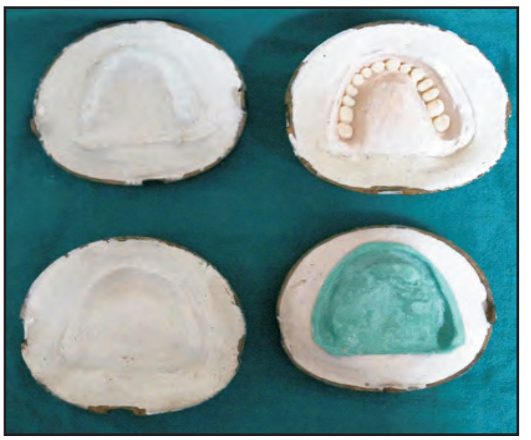

Figure-2 : Two interchangeable flask having base and the cope part separate

6. Again the wax elimination was done and the packing, followed by curing of both

the flasks were done in conventional manner.

7. This resulted in two halves; i.e. a denture base and denture teeth, which has to be fused together.(figure-3,4)

Figure-3 : Seperately cured tooth part of denture

Figure-4 : Cured base part of denture

8. The two halves were closed together and checked for hinderances. Ensuring they should close properly.
9. A thin beading of autopolymerising acrylic was applied around the corners of the denture base and flasks were closed tightly. After polymerisation the denture was checked for complete seal by placing in water.(figure-5)

Figure-5 : Denture floating in water

10. Finished and polished denture was than inserted in the patient's mouth.(figure-6)

Figure-6 : Denture inserted in patient mouth

Discussion

Severely atrophic mandible is most common problem seen in clinical practice, but severely resorbed maxillary arch also poses similar problem. The technique described is simple and does not require any spacer. It reduces the weight of maxillary denture by 25%. Light weight maxillary denture somehow reduces the gravitational action and thus aids in retention, but care should be taken while fusing two halves so that the acrylic doesn't flow inside the part to be hollowed. Whenever the weight of the denture is the contributing factor to the successful resolution of a patient's problem, the hollow denture should be considered, with both an atrophic alveolar ridge and a greater than usual interocclusal distance.

References :

1. Jacobson TE, Krol AJ. A contemporary review of the factors involved in complete denture retention, stability and support. Part I : retention. J Prosthet Dent 1983;49:5-15
2. Wormley JH, Brunton DA. Weighted mandibular dentures. J Prosthet Dent 1974;32:101-2
3. el Mahdy AS. Processing a hollow obturator. J Prosthet Dent 1969;22:682-6
4. Brown KE. Fabrication of a hollow bulb obturator. J Prosthet Dent 1969;21:97-103
5. Nidiffer TJ, Shipman TH. Hollow bulb obturatoe for acquired palatal openings. J Prosthet Dent 1957;7:126-34
6. Buckner H. Contruction of denture with hollow obturator, lid and soft acrylic lining. J Prosthet Dent 1974;31:95-9
7. Worley JL, Kniejski ME. A method of controlling the thickness of hollow obturator prosthesis. J Prosthet Dent 1983;50:227-9
8. Jhanji A, Stevens ST. Fabrication of one piece hollow obturatoe. J Prosthet Dent 1991;66:136-8
9. Elliot DJ. The hollow bulb obturator: its fabrication using one denture flask. Quintessence Dent Technol 1983;7:13-4
10. Fattore LD, Fine L, Edmonds Dc. The hollow denture: an alternative to atrophic maxillae. J Prosthet Dent 1988;59:514-6
11. O'Sullivan M, Hansen N, Cronin RJ, Cagna DR. The hollow maxillary complete denture: A modified technique. J Prosthet Dent 2004;91: 591-4.