

A Technique to Fabricate Weightless Maxillary Complete Denture Prostheses on Resorbed Ridges: A Case Report

Moulinath Chikati Deepak^{1*} Munagapati Bharathi² Muduganti Jawali Reddy³ Balagouni Lavanya⁴

¹PG Student, Department of Prosthodontics, Crown and Bridge, G Pullareddy Dental College and Hospital, Kurnool, Andhra Pradesh, India.

²Professor and Head, Department of Prosthodontics, Crown and Bridge, G Pullareddy Dental College and Hospital, Kurnool, Andhra Pradesh, India.

³PG Student, Department of Prosthodontics, Crown and Bridge, G Pullareddy Dental College and Hospital, Kurnool, Andhra Pradesh, India.

⁴PG Student, Department of Prosthodontics, Crown and Bridge, G Pullareddy Dental College and Hospital, Kurnool, Andhra Pradesh, India.

ABSTRACT

Background: It is a challenge to the prosthodontist to manage highly resorbed ridges as there is decreased retention, support and stability of complete denture prosthesis. Inter arch distance may increased in atrophic ridges, so the fabrication of conventional complete denture becomes heavy and may decreased in retention . So for better retention these weightless dentures is required by making it hollow , aids in preservation of atrophic ridges . This article describes a case of completely edentulous patients successfully managed by rehabilitating with weightless maxillary complete denture.

Keywords: Residual ridge resorption, Atrophic ridges, Inter ridge distance, Weightless maxillary complete denture, Hollow denture.

INTRODUCTION

Residual ridge resorption is a complex biophysical process and a common occurrence following extraction of teeth which proceeds slowly over a long period of time . Severely resorbed ridges may lead to increased inter ridge distance^{1,2}. Increased inter ridge distance often results in heavy maxillary complete denture that further reduces the retention of the prosthesis. Various weight reduction approaches^{3,4} have been achieved using a solid three dimensional spacer, including dental stone^{5,6}, cellophane wrapped asbestos⁷, silicone putty^{8,9} or modelling clay¹⁰ during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis. As hollow was made in denture it become weightless and resist the forces of gravity which may lead for better retention . Fattore et al¹¹ used a variation of a double flask technique for obturator fabrication

by adding heat polymerizing acrylic resin over the definitive cast and processing a minimal thickness of acrylic resin around the teeth using a different drag. Both portions of resin were then attached using heat-polymerized resin. This article describes a case report with severely resorbed ridges and increased inter-ridge distance was treated with a hollow maxillary denture .

CASE REPORT

A 62 year old male patient reported to the department of prosthodontics, G. Pulla Reddy Dental College, Kurnool, with a chief complaint of loss of teeth and desired the replacement . History revealed loss of teeth due to periodontal reasons and was completely edentulous for past 8 years without wearing dentures . On clinical examination both maxillary and mandibular teeth were atrophic

Received: Nov. 6, 2016; Accepted: Dec. 7, 2016

*Correspondence Dr. Moulinath Chikati Deepak.

Department of Prosthodontics, Crown and Bridge, G Pullareddy Dental College and Hospital, Kurnool, Andhra Pradesh, India.

Email: deepakmouli143@gmail.com

with increased inter ridge distance and long lip length.(Fig.1)

In this cases fabrication of complete denture in conventional manner may have resulted in heavy denture on atrophic ridges and may lead to decreased retention.so fabrication of weightless maxillary complete denture which is hollow may provide better retention and stability.

TECHNIQUE

Preliminary impressions of both edentulous maxilla and mandible was made with impression compound (Y-DENTS,MDM CORPORATION).The impressions were then poured with dental plaster.on preliminary cast custom tray was fabricated with autopolymerizing acrylic resin(DPI-RR COLD CURE)and then border moulding was performed with green stick(DPI PINNACLE TRACING STICKS,BOMBAY BURMAH TRADING CORPORATION)and final impression was made with zinc oxide eugenol impression paste . The occlusal rims were fabricated by modeling wax and then jaw relations were done in a conventional manner. Teeth were selected, anterior try in followed by posterior try in was done in balanced occlusion (Fig.2). The mandibular denture was then processed in a conventional manner.

The steps for the fabrication of hollow maxillary complete denture were as follows:

1. Interchangeable flasks were used to construct a maxillary hollow denture .
2. The maxillary trial denture was flaked and dewaxed in the conventional manner (Fig.2).
3. On the maxillary master cast adapt 2mm thickness of modeling wax and invest it by using a second flask complete the wax elimination process (Fig.4a,4b).
4. Permanent record base was obtained on the master cast by packing and processing with heat cure polymerized acrylic resin in conventional manner (Fig.5). This permanent record base left undisturbed on master cast.
5. The thickness of the spacer for heat cure resin is obtained by: Thickness of spacer = distance from ridge lap area of tooth to the sulcus depth margin - [2mm thickness of denture base + 2mm distance from the ridge lap of the tooth]

6. By knowing the value of spaces adapt play doh on a spacer on the permanent record base with uniform thickness once verified thickness of spacer by placing wax strips of 2mm thick over the acrylic teeth. Closed the flask and reopened, observed the wax strip if it becomes thin at any point adjust the thickness of play doh uniformly for sufficient clearance to flow heat cure resin (Fig.6a,6b).
7. The heat cure polymerizing resin was then packed and processed by placing the flask with the teeth over the play doh and permanent record base (Fig.7).
8. After curing processing errors were corrected by lab remounting.
9. Distal to most posterior teeth of the denture base an orifice was made on either side for removal of the spacer with the help of orthodontic wire (Fig.8a).
10. The orifice of the denture was then sealed with auto polymerizing resin and polished in usual manner (Fig.8b).
11. The sealed orifice was then verified by immersing the denture in water and checked for any bubbles. An adequate seal was confirmed if no bubbles are evident and denture floats on water (Fig.9).
12. The dentures were inserted in the patient's mouth and instructions were given. (Fig.10)
13. Patient reviewed after 24hrs for check up.

DISCUSSION

The atrophic ridges with large inter ridge distance often pose a clinical challenge during fabrication of a successful complete denture. Fabrication of denture in increased inter ridge distance often results in heavy maxillary complete denture followed by decreased retention of the prosthesis. modifying the type of denture may also be better, apart from modifying the impression technique to get maximum denture bearing area¹².

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^{13,14}. It has also been proved that prosthesis weight can be reduced by making the denture base hollow, not only weight but also reduces extra loads on underlying tissues and remaining amount of bone¹. Kaira et al¹⁵ used putty as a spacer which was



Fig 1: Pre-operative.



Fig 2: Teeth arrangement done.



Fig 3: De-waxing done.



Fig 4a: Base plate wax adapted



Fig 4b: Dewaxing of base plate wax.



Fig 5: Permanent record base.



Fig 6a: Play doh adapted to the permanent record base



Fig 6b: Adapted wax strip.



Fig 7: Packing with heat cure acrylic resin.



Fig 8a: Denture With Opened Channels.



Fig 8b: Denture With sealed Channels



Fig 9: Floating maxillary hollow denture.



Fig 10: Post-operative.

found to be difficult to remove especially from anterior portion of the denture.

The procedure described in this article incorporate the use of play doh as a spacer for easy removal. An even thickness of the spacer can be achieved by placing even thickness of wax sheet over acrylic teeth in the flask leads to leaving a hollow space in the maxillary complete denture without any distortion. Thus the weight of the acrylic denture was reduced.

CONCLUSION

This article describes a technique for fabrication of hollow complete denture using playdoh to reduce the weight of the denture. Fabrication of hollow maxillary denture rather than conventional denture over resorbed ridges with increased inter ridge distance not only reduces the weight of the denture but also results in better retention and stability which provide comfortable to the geriatric patient.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Shweta Pandurang, Caculo. BDS, Meena Ajay Aras, MDS, and Vidhya Chitre, MDS. Hollow Dentures: Treatment Option for Atrophic Ridges. A Clinical Report. Journal of Prosthodontics. 2012;22:217-222.

2. Michael O'Sullivan, B Dent Sci, MSc, PhD, A Nancy Hansen, CDT, B Robert J. Cronin, DDS, MSc, and David R. Cagna, DMD. The hollow maxillary complete denture: A modified technique. J Prosthet Dent. 2004;91:591-4.
3. Karen S. McAndrew. DMD, MS, Sandra Rothenberger, and Glenn E. An innovative investment method for fabrication of a closed hollow obturator prosthesis. J Prosthet Dent 1998;80:129-32.
4. Horst Buckner, C.D.T. Construction of a denture with hollow obturator, lid, and soft acrylic lining. J Prosthet Dent. 1974;31;1:95-99.
5. Ackerman AJ. Prosthetic management of oral and facial defects following cancer surgery. J Prosthet Dent 1955;5:413-32.
6. Chalian VA, Barnett MO. A new technique for constructing a one-piece hollow obturator after partial maxillectomy. J Prosthet Dent 1972; 28: 448-53.
7. Worley JL, Kniejski ME. A method for controlling the thickness of hollow obturator prostheses. J Prosthet Dent 1983; 50:227-9.
8. Holt RA Jr. A hollow complete lower denture. J Prosthet Dent 1981; 45:452-4.
9. Jhanji A, Stevens ST. Fabrication of one-piece hollow obturators. J Prosthet Dent 1991; 66:136-8.
10. DaBreo EL. A light-cured interim obturator prosthesis. A clinical report. J Prosthet Dent 1990; 63:371-3.
11. Fattore LD, Fine L, Edmonds DC. The hollow denture: an alternative treatment for atrophic maxillae. J Prosthet Dent 1988; 59:514-6.
12. Kalavathy N, Shetty MM, Premnath, Pawashe K, Patel RKV: Hollow mandibular complete denture - A case report. SRM University Journal of Dental Sciences, 2010;1(3): 243-246.
13. Brown KE. Fabrication of a hollow bulb obturator. J Prosthet Dent 1969;21:97-103.
14. El Mahdy AS. Processing a hollow obturator. J Prosthet Dent 1969;22:682-6.
15. Kaira LS, Singh R, Jain M, Mishra R. Light weight hollow maxillary complete denture: A case series. J Orofac Sci 2012;4:143-7.