International Journal of Medical Science in Clinical Research and Review
Online ISSN: 2581-8945
Available Online at http://www.ijmscrr.in Volume 7|Issue 01 (January-February)|2024 Page: 100-102

Case Report

Rehabilitation of A Severely Resorbed Edentulous Maxillary Arch By A Hollow Denture: A Clinical Report

Dr. Supriyo Jana, Dr. Sreya Kundu
MDS (Prosthodontics and Crown & Bridge), Senior Lecturer, Department of Prosthodontics and Crown & Bridge, Guru Nanak Institute of Dental Science & Research, Kolkata, India
MDS (Prosthodontics and Crown & Bridge), Senior Lecturer, Department of Prosthodontics and Crown & Bridge, Guru Nanak Institute of Dental Science & Research, Kolkata, India.
Corresponding Author:
Dr. Supriyo Jana
MDS (Prosthodontics and Crown & Bridge), Senior Lecturer, Department of Prosthodontics and Crown & Bridge, Guru Nanak Institute of Dental Science & Research, Kolkata, India

Article Received: 23-December-2023, Revised: 13-January-2023, Accepted: 03-February-2024

ABSTRACT:
Resorption of the residual ridges poses a number of challenges to the prosthodontist, especially during fabrication of complete dentures. Extremely resorbed ridges usually do not offer satisfactory levels of retention and stability to the dentures. Such cases also present with an increased amount of vertical dimension that can lead to an increased bulk of the dentures. The following is a case presentation where a hollow maxillary complete denture was fabricated to counteract the difficulties posed by an extremely resorbed residual ridge.

Keywords: light-weight denture, hollow denture, maxillary ridge resorbtion, increased retention, solid spacer.

INTRODUCTION:

The success of complete denture therapy depends on many important factors, retention being one of them. The retention of a maxillary complete denture is very significant due to the psychologic comfort of the patient. [1] This property can often be compromised by extreme resorption of the residual ridges. Excessive resorption can lead to increased vertical dimension, causing reduced retention and stability of the dentures. An important factor for retention of a complete denture, is weight and gravitational forces, which play a crucial role in the retention of the mandibular complete denture. [1] Although not thoroughly investigated, it is widely accepted that maxillary complete dentures also benefit from reduced weight. This belief primarily roots from the fact that hollow-bulb obturators, given in cases of extensive maxillary defects, benefit from their reduced weight [2] causing better retention. An extremely resorbed completely edentulous maxillary ridge can be considered similar to the afore mentioned situation. Therefore, a hollow denture, which reduces a significant volume of denture base material, can be useful in such a situation. Several methods have been described to fabricate a hollow denture. Usually, a three-dimensional solid spacer is used to create a hollow cavity inside the denture, which is then removed subsequently. Various materials have been used to create the hollow cavity, such as, asbestos [3], modelling clay [4], silicone putty [5,6], gauze coated with light body silicone [7], plaster [8], salt [9].

This article describes a report of an edentulous patient with resorbed maxillary and mandibular ridges, where an easier technique was employed for fabricating hollow maxillary complete denture.

CASE REPORT:

A 72-year-old male patient reported to the Department of Prosthodontics and Crown & Bridge, with the chief complaint of difficulty of eating for the past 1 year. He had been edentulous for the last 8 years and had a previous denture, which had poor retention and stability.

Intra-oral examination revealed highly resorbed maxillary and mandibular edentulous ridges. After a thorough evaluation of the patient's history, medical records, radiographs and overall clinical condition, the patient was presented with two treatment options – either an implant-supported prosthesis, or conventional complete dentures. The patient consented to the conventional complete denture option to avoid the risk of surgery and additional cost of implants. The primary impressions were made using high fusing impression compound (Y-Dent, India) and final impressions with zinc-oxide impression paste (Impression paste, DPI,India) after border moulding with low fusing compound material (Pinnacle tracing sticks, DPI, India). Following the preliminary jaw relation, it was observed that the vertical dimension of the patient was sufficiently large and the final dentures can become quite heavy, especially the maxillary one and may

compromise the retention. So it was decided to fabricate a hollow denture for the maxillary arch.
Following the facebow records (Hanau™ Springbow), the casts were mounted in the Hanau Wide-Vue articulator. Gothic arch tracing was done using an intra-oral tracer and inter-occlusal records were taken. A rectangular box-shaped portion of wax was demarcated and removed from the estimated premolar-molar region of the maxillary rim on both sides using a lecron curver [Fig.1]

Fig. 1 – Hollowing-out of maxillary occlusal rim

This procedure was done with utmost care, leaving a 2mm thick wax on the occlusal, buccal and inferior portions of these boxes and taking care not to distort the rims. Then soft putty consistency addition silicone material (Photosil soft putty,DPI,India) was filled inside these boxes Fig. 2 and a layer of thin aluminium foil was placed to act as a separating medium. Small "lids" with small handles of self-cure acrylic resin (DPI Rr cold cure,DPI,India) were fabricated over the putty. Teeth setting and balancing were done and try-in was performed. The rims were transferred back to the articulator and the anterior canine-to-canine region of the maxillary rim was then prepared in a similar manner.

Fig. 2 – Insertion of putty in hollowed-out occlusal rim

The trial dentures were then flasked in the conventional manner, with the acrylic "lids" flasked separately. After dewaxing, the putty spacers were replaced in their respective positions using a cyanoacrylate adhesive material. Both the dentures and the lids were packed using heat cure acrylic resin (DPI Rr heat cure,DPI) and were processed in the conventional manner. Following remounting and refining of the occlusion, the windows in the maxillary denture were closed with the "lids" using self-cure acrylic resin. The handles on the lids were removed with a bur and the dentures [Fig. 3] were finished, polished and delivered to the patient. The patient was reviewed after 24 hours, 7 days and 1 month post-operatively.

Fig. 3 – Final hollow denture

DISCUSSION:

The rehabilitation of severely resorbed edentulous arches is challenging to the Prosthodontist. Despite the advent of implants, most geriatric patients often do not consent to them. Hence, conventional complete denture is often the mainstay of their treatment, especially in developing countries. The use of hollow dentures to alleviate the problem of poor retention, associated with resorbed ridges, has been well documented [5-9]. The method most commonly employed for fabricating hollow dentures is by using a clear template and a solid spacer [5,7,9]. But, the main disadvantage of such methods is that they use a double-flask technique for fabricating the final dentures [5,7,9]. This makes such methods more time-consuming and often tedious. The method described in this article is simple, effective and less time-consuming. The putty spacers were also acrylized separately and the acrylic counterparts were weighed. The combined weight of the three acrylic spacers was found to be 7 grams, which implies that there was an equivalent amount of weight reduction in the final denture.However, care should be taken not to distort the rims while creating the window for the putty spacers.

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(1):5-15.
2. el Mahdy AS. Processing a hollow obturator. J Prosthet Dent. 1969;22(6):682-686.
3. Worley JL, kniejski ME. A method for controlling the thickness of hollow obturator prostheses. *J Prosthet Dent*. 1983; 50: 227-229.
4. Jhanji A, Stevens ST. Fabrication of one-piece hollow obturators. *J prosthet Dent*. 1991; 66: 136-138

5. O'Sullivan M, Hansen N, Cronin RJ, Cagna DR. The hollow maxillary complete denture : A modified technique. J Prosthet Dent. 2004;91(6):591-594.
6. Gandhi S, Talukder D, Datta P, Gupta A, Rathee S. Light weight maxillary denture: An innovative technique for atrophic ridge – a case report. IOSR JDMS. 2018;17(12):19-23.doi: 10.9790/0853-1712071923.
7. Caculo SP, Aras MA, Chitre V. Hollow dentures: treatment option for atrophic ridges. A case report. J Prosthodont. 2012;00:1-6. Available from: doi: 10.1111/j.1532-849X.2012.00921.x
8. Bhandari A, Singh SK, Suwal P, Parajuli PK, Manandhar A. Rehabilitation of severely resorbed maxilla with a hollow maxillary complete denture. Journal of BP Koirala Institute of Health Sciences. 2013;11(3):281-283.
9. Kaira LS, Dabral E. Hollow maxillary denture : A new modified technique for improving retention in resorbed maxillary ridges. SRM Journal of Research in Dental Sciences. 2014;5(1):51-54. Available from: doi: 10.4103/0976-433X.129074