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Case Report

A novel technique for prosthodontic rehabilitation of unconventional edentulous ridge – A case report

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Abstract

Prosthodontic rehabilitation of a patient with compromised edentulous ridges using conventional methods is a challenging task. Modifications in treatment procedures should be considered to meet the patient's functional and aesthetic needs. Treatment adaptations for unconventional ridges begin with accurate impression making to record the maximum denture-bearing area without interference. Recording the entire functional denture-bearing area ensures optimal retention, stability, and support for the denture during use.

This case report describes a modified impression technique utilizing a perforated metal mesh embedded within the custom tray to address the limitations associated with the differential pressure impression technique in managing unconventional edentulous ridges. Such a technique may also serve as a gold standard for prosthetic rehabilitation in cases involving flabby or hyperplastic tissues.

Keywords: Complete denture**,** Impression technique, Metal mesh, Polymer resin, Unconventional ridge

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1. Introduction

A thorough medical and dental history, along with a comprehensive clinical examination of the patient, leads to a better prognosis for the prosthodontic rehabilitation of a completely edentulous patient with complete dentures. Devan's principle should be followed: the perpetual preservation of what remains is more important than the meticulous replacement of what is missing.[1]

The treatment of a highly resorbed ridge with complete dentures poses a significant challenge for both prosthodontists and general practitioners, as bone resorption commonly occurs beneath complete lower dentures.[2] It is also widely acknowledged that the rate of resorption varies among individuals.[3,4] With the increase in life expectancy in the modern era, there is a corresponding rise in the number of people wearing dentures for extended periods.[5,6]

Highly resorbed residual mandibular ridges are frequently observed in elderly individuals. These patients typically present with thin, atrophic mucosa, reduced pain-bearing capacity, decreased tissue resiliency and muscle tonicity, and limited adaptive ability. Achieving stability in lower dentures remains a significant challenge for all.[7] To fabricate a stable complete denture, the impression must be accurate and provide physiological comfort to the patient.[8]

In such cases, ridge augmentation and implants are the treatment of choice. However, surgical intervention may not always be feasible, and conventional dentures must be fabricated to enhance the patient's quality of life. This case highlights a method to stabilize the mandibular denture by incorporating a perforated metal mesh within the custom tray to overcome the shortcomings of the differential pressure impression technique used in recording unconventional edentulous ridges.

2. Case Report

A 45-year-old female patient reported to the Department of Prosthodontics with a chief complaint of missing teeth in the

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upper and lower jaw regions and expressed a desire for their replacement. She had undergone multiple extractions of her upper and lower teeth over a span of two years due to periodontitis. The medical history was non-contributory.

2.1. Intraoral examination

Intraoral examination revealed completely edentulous maxillary and mandibular ridges (**Figure 1**). The mucosa appeared healthy, and the consistency of saliva was medium. The patient was cooperative and exhibited a philosophical attitude. The arch size was medium and square. The soft palate was horizontal with minimal muscular movement, allowing for greater tissue coverage in the posterior palatal seal area. [9]

2.2. Treatment procedure

A preliminary impression of the edentulous maxilla and mandible was made using impression compound (Rolex, Delhi, India) (**Figure 2**). Irreversible hydrocolloid (Algitek, DPI, Mumbai, India) was used for the corrective impression, and Type II dental plaster (Dentex, Jammu, India) was used to pour the primary cast for custom tray fabrication.

A double-thickness wax spacer (Rolex Ashoo Sons, Delhi) was adapted to the anterior edentulous mandibular region as relief. Over this, a tin foil spacer was placed to facilitate easy removal of the wax. A cut section of metal mesh (MAARC Stainless Steel Reinforcement Mesh, Maharashtra, India) was embedded in the anterior portion of the mandibular custom tray (**Figure 3**). The custom tray was then fabricated (**Figure 4**).

Peripheral seal was achieved using green stick impression compound (DPI Pinnacle, Mumbai, India) in both arches. The secondary impression for the maxilla was made with zinc oxide eugenol impression material (DPI Impression Paste, Mumbai, India), while in the mandible, a low-viscosity elastomeric impression material (Zetaplus System, Zhermack, Italy) was used. Impressions were poured using Type III dental stone (Kala Bhai, Mumbai, India) (**Figure 5**).

Occlusion rims were fabricated on the denture bases, and jaw relations were recorded. After mounting, teeth arrangement was completed based on anatomical, functional, and aesthetic requirements of the patient, followed by a try-in (**Figure 6**). Dentures were processed using the conventional compression molding technique with heat-cure polymethyl methacrylate resin (DPI Heat Cure, Mumbai, India).

Following occlusal adjustments, the maxillary and mandibular dentures were inserted into the patient's mouth. Post-insertion instructions for care and maintenance of the prostheses were thoroughly explained to the patient (**Figure 7**).

Figure 1: Extra oral & intra oral view of the patient

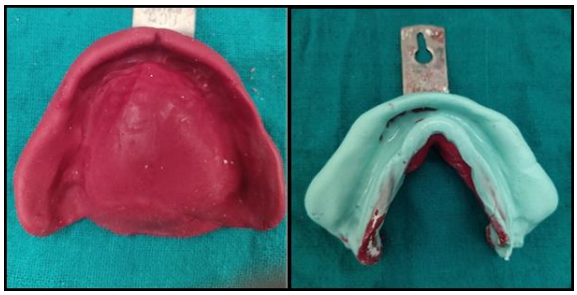

Figure 2: Primary Impression

Figure 3: Wax spacer & tin foil adaptation

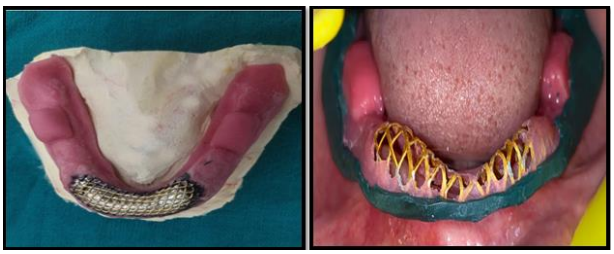

Figure 4: Metal mesh custom tray

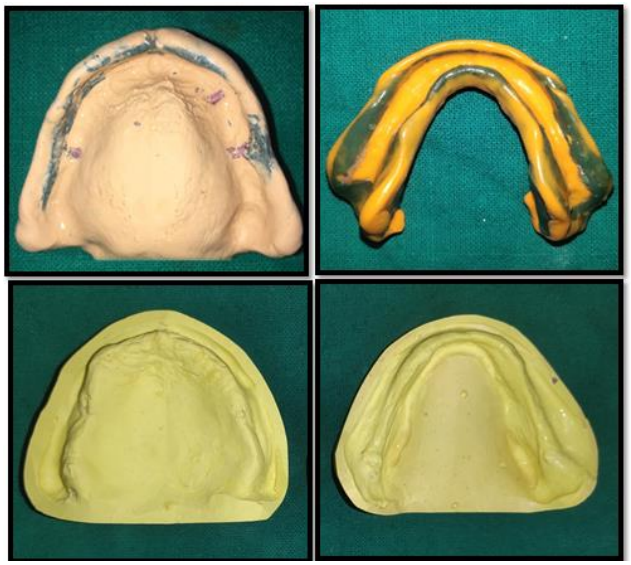

Figure 5: Final impressions and casts – maxillary & mandibular

Figure 6: Try-in

Figure 7: Denture insertion

3. Discussion

Edentulous patients often seek dental treatment to replace their missing teeth for aesthetic, phonetic, and functional reasons. The prognosis of complete denture prostheses largely depends on three critical factors: retention, stability, and support. In varying clinical scenarios, impression techniques must be skillfully modified by the prosthodontist to achieve optimal outcomes.[10]

At times, the ridge form may be unconventionally abnormal, necessitating precise impression techniques to fabricate a stable prosthesis that offers comfort to the patient. While ridge augmentation through surgical intervention is often the treatment of choice in such cases, it may not always be feasible. In such instances, a conventional prosthesis must be provided.[7]

According to the Glossary of Prosthodontic Terms, 9th edition, residual ridge resorption (RRR) refers to the progressive loss of the quantity and quality of the residual alveolar ridge following tooth extraction.[11] The etiology of residual ridge resorption is multifactorial and may include anatomical, metabolic, and mechanical factors.[12]

In the present case report, a modified impression technique was employed using a perforated metal mesh incorporated into the custom tray. This approach was adopted to overcome the limitations associated with the differential pressure impression technique in recording an unconventional edentulous ridge.[13] The metal mesh was chosen as it enhances uniformity in the final impression, accurately records the denture-bearing area, and provides the maximum support needed for such compromised ridges. Ultimately, this ensures the success of the final prosthesis. This technique may be considered a gold standard for the prosthetic rehabilitation of edentulous ridges that present with flabby or hyperplastic tissues.

4. Conclusion

Prosthodontic rehabilitation of patients with unconventional ridge forms presents a significant challenge for the prosthodontist. To achieve better prognosis in terms of aesthetics and function, the treatment plan must be appropriately modified. Utilizing modified impression techniques, particularly for the mandibular ridge, can lead to improved retention and greater overall patient satisfaction. The current case describes a modified version of the differential pressure impression technique aimed at maximizing support and ensuring the success of the final complete denture.

5. Conflict of Interest

None.

6. Source of Funding

None.

References

1. Prasad DK, Mehra D, Prasad DA. Prosthodontic management of compromised ridges and situations. *Nitte Univ J Health Sci*. 2014;4(1):141–8.
2. McCord JF, Tyson KW. A conservative prosthodontic option for the treatment of edentulous patients with atrophic (flat) mandibular ridges. *Br Dent J*. 1997;182(12):469–72.
3. Atwood DA. The problem of reduction of residual ridges. In: Winkler S, editor. Essentials of complete denture prosthodontics. 2nd ed. St Louis: Ishiyaku EuroAmerica; 1996. p. 22–38.
4. Atwood DA. Post-extraction changes in the adult mandible as illustrated by microradiographs of midsagittal sections and serial cephalometric roentgenograms. *J Prosthet Dent*. 1963;13(5):810–24.
5. Fernandes V, Singh RK, Chitre V, Aras M. Functional and esthetic rehabilitation of a patient with highly resorbed, asymmetrical residual ridge. *J Indian Prosthodont Soc*. 2001;1:22–4.
6. Mirza FD, Dikshit JV. Management of lower poor foundation—a simple solution. *J Indian Prosthodont Soc*. 2002;2:16–8.

7. Prithviraj DR, Singh V, Kumar S, Shruti DP. Conservative prosthodontic procedure to improve mandibular denture stability in an atrophic mandibular ridge. *J Indian Prosthodont Soc.* 2008;8:178–83.
8. Jacobson TE, Krol AJ. A contemporary review of the factors involved in complete dentures. Part III: support. *J Prosthet Dent*. 1983;49(3):306–13.
9. Engelmeier RL, Phoenix RD. Patient evaluation and treatment planning for complete-denture therapy. *Dent Clin North Am*. 1996;40(1):1–18.
10. Sikri A, Sikri J, Prosthetic management of flabby ridge using customized prefabricated metal mesh custom tray impression technique: A case report. *IP Ann Prosthodont Restor Dent*. 2022;8(1):50–60.
11. Kaur R, Kumar M. Residual ridge resorption revisited. *Dent J Adv Stud*. 2017;5(2):76–80.
12. Sikri A, Sikri J, Singh N, Bali P, Mittal N. Prosthodontic management of knife-edge ridge using customized prefabricated metal mesh custom tray impression technique. *Dent J Indira Gandhi Inst Med Sci*. 2022;1(2):59–68.
13. Sikri A, Sikri J, Kalra T, Sharda R, Bathla N, Thakur S. Customized Preliminary Impression: A Novel Impression Technique for Severely Resorbed Edentulous Ridges. *SJMS*. 2023;18(3):325–37.

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