OPEN ACCESS
Global Journal of Research in Dental Sciences
ISSN: 2583-2840 (Online)
Volume 06 | Issue 03 | May – June | 2026
Journal homepage: https://gjrpublication.com/gjrds/
Case Report

Characterized Complete Denture Fabricated Using an Existing Denture as a Custom Impression Tray and Root Carving Technique: A Clinical Case Report

*Dr. Arpit Sikri [1], Dr. Ankit Sikri [2], Dr. Annupriya Sikri [3], Dr. Jyotsana Sikri [4] and Khempreet Kaur [5]

[1] Professor & Post Graduate Teacher, Department of Prosthodontics, Crown & Bridge and Oral Implantology, Bhojia Dental College & Hospital, Budh (Baddi), Teh. Baddi, Distt. Solan, Himachal Pradesh, India.
[2] Professor & PG Guide, Department of Orthodontics & Dentofacial Orthopaedics, Guru Nanak Dev Dental College & Research Institute, Sunam, Punjab, India.
[3] Professor, Department of Pedodontics & Preventive Dentistry, Guru Nanak Dev Dental College & Research Institute, Sunam, Punjab, India.
[4] Associate Professor & Post Graduate Teacher, Department of Conservative Dentistry & Endodontics, Bhojia Dental College & Hospital, Budh (Baddi), Teh. Baddi, Distt. Solan, Himachal Pradesh, India.
[5] BDS Intern, Bhojia Dental College & Hospital, Budh (Baddi), Teh. Baddi, Distt. Solan, Himachal Pradesh, India.

DOI: 10.5281/zenodo.20830197 **Submission Date: 20 April 2026 | Published Date: 24 June 2026**

***Corresponding author: Dr. Arpit Sikri**
Professor & Post Graduate Teacher, Department of Prosthodontics, Crown & Bridge and Oral Implantology, Bhojia Dental College & Hospital, Budh (Baddi), Teh. Baddi, Distt. Solan, Himachal Pradesh, India.

Abstract

Background

The fabrication of complete dentures for edentulous patients often requires multiple clinical appointments and extensive laboratory procedures. Utilizing an existing denture as an impression tray provides a practical and cost-effective alternative for obtaining accurate impressions while preserving the patient's accustomed vertical dimension and occlusal relationship. Additionally, characterization techniques such as root carving can significantly enhance the esthetic outcome of complete dentures.

Case Presentation

A completely edentulous patient presented with an ill-fitting maxillary and mandibular complete denture. The existing dentures exhibited inadequate retention, stability, and esthetics due to progressive residual ridge resorption and wear of the prosthetic teeth. A simplified impression technique was employed using the patient's existing dentures as custom trays. Border molding was performed with addition silicone putty, followed by a wash impression using light-body addition silicone. The resultant impressions were used to fabricate new complete dentures. Gingival characterization was achieved through root carving and contour modification to mimic natural dentition and supporting tissues. The prosthesis was delivered following routine clinical and laboratory procedures.

Results

The definitive dentures demonstrated improved retention, stability, support, and esthetics. The characterized gingival anatomy provided a more natural appearance, enhancing patient satisfaction. The patient reported improved comfort, masticatory efficiency, and confidence during social interactions.

Conclusion

The use of existing dentures as impression trays combined with silicone border molding and wash impression techniques offers a predictable approach for complete denture rehabilitation. Root carving and gingival characterization further improve the esthetic integration of complete dentures, resulting in enhanced patient acceptance and satisfaction.

Keywords: *Complete denture, Denture characterization, Existing denture impression, Functional impression, Root carving.*

INTRODUCTION

Complete edentulism remains a significant oral health concern worldwide, particularly among the elderly population. Although implant-supported prostheses have gained popularity, conventional complete dentures continue to be the primary treatment modality for many patients owing to financial, anatomical, and systemic considerations. Successful complete denture therapy depends upon accurate impressions, proper border extension, adequate support, retention, stability, and satisfactory esthetics.[1]

Conventional complete denture fabrication often involves multiple impression procedures using stock trays and custom trays. However, in patients wearing existing dentures with acceptable occlusal relationships and vertical dimension, the existing prosthesis can be utilized as a custom tray for making definitive impressions.[2] This approach reduces chairside time, improves patient comfort, and captures the denture-bearing tissues under conditions similar to those experienced during function.[3]

Modern elastomeric impression materials, particularly addition silicone, provide excellent dimensional stability and detail reproduction, making them suitable for functional complete denture impressions.[4] Border molding using silicone putty followed by a light-body wash impression can effectively record peripheral extensions and supporting tissues.[5]

In addition to functional requirements, esthetics plays a crucial role in patient satisfaction. Conventional complete dentures often exhibit a uniform gingival appearance that may compromise naturalness. Denture characterization techniques such as root carving, gingival festooning, and pigmentation can create a lifelike appearance by simulating natural root eminences and gingival contours.[6,7]

This case report describes the rehabilitation of an edentulous patient using the existing denture as a custom impression tray with putty border molding and light-body wash impression, followed by fabrication of a characterized complete denture incorporating root carving.

CASE REPORT

A 90-year-old female patient reported to the Confidental Multi-Speciality Dental and Orthodontic Clinic, Sahibzada Ajit Singh Nagar (Mohali), Punjab, India with the chief complaint of loose and unstable complete dentures. The patient had been wearing complete dentures for approximately 20 years. Difficulty in mastication, compromised speech, and dissatisfaction with appearance were reported.

Clinical Examination

Extraoral examination revealed adequate facial symmetry with mild loss of lower facial height associated with prosthesis wear. Intraoral examination demonstrated completely edentulous maxillary and mandibular arches. The residual ridges exhibited moderate resorption. The existing dentures showed worn occlusal surfaces, reduced retention, inadequate peripheral seal, and poor tissue adaptation.

Following clinical evaluation, fabrication of new complete dentures was planned. Since the existing dentures maintained a satisfactory occlusal relationship and acceptable vertical dimension, they were utilized as impression trays for definitive impressions.

Impression Procedure

The intaglio surfaces of the existing dentures were evaluated and adjusted where necessary. Border molding was performed using single-step technique i.e. using putty viscosity elastomeric impression material (Zhermack Elite HD+ Putty Soft, Zhermack SpA, Italy). The dentures were inserted intraorally, and the patient was instructed to perform functional movements including smiling, puckering, swallowing, tongue movements, and opening and closing of the mouth to shape the peripheral extensions.

Following verification of border extensions, wash impressions were made using the light-bodied material (Zhermack Elite Hd+ Light Body, Zhermack SpA, Italy) to ensure optimal detail reproduction and dimensional stability (Figure 1). The light-body material was uniformly applied to the tissue surface of the dentures, and the prostheses were seated intraorally. Functional movements were repeated to ensure accurate recording of the denture-bearing tissues and peripheral borders.

The completed impressions were inspected and found satisfactory with adequate coverage and detail reproduction. The master casts were poured in type IV gypsum product, i.e., die stone (GypRock stone, Rajkot, Gujarat, India) following standard laboratory protocols.

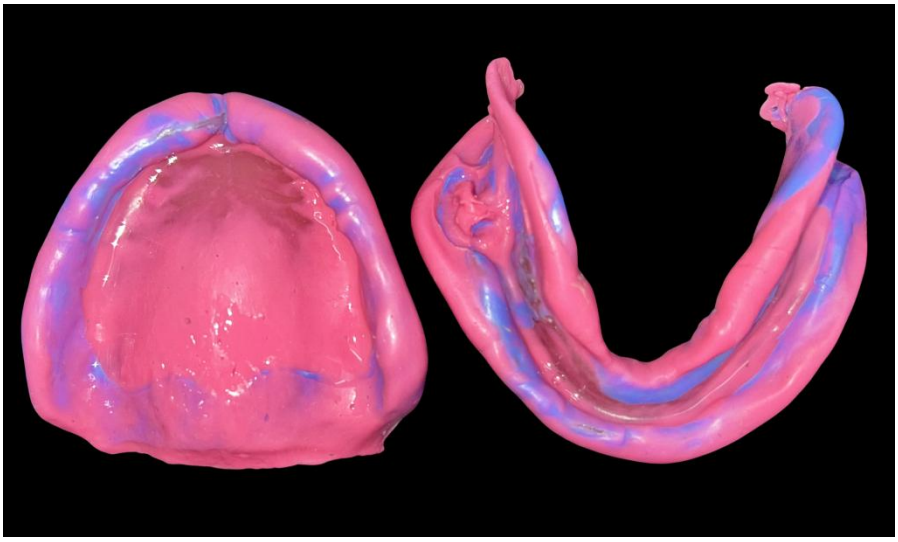

Figure 1: Final impressions – maxillary & mandibular

Denture Fabrication

Jaw relation records were obtained and verified. Artificial teeth were arranged according to established esthetic and functional principles. Following successful try-in evaluation (Figure 2), the dentures were processed using heat-polymerized acrylic resin.

Figure 2: Waxed up Try in

Denture Characterization

To improve esthetic outcomes, root carving was performed on the waxed gingival surfaces before processing. Prominent root eminences corresponding to the canine and anterior teeth were sculpted. Gingival festooning and contouring were carried out to replicate natural gingival anatomy. The resulting prosthesis exhibited enhanced surface morphology and a more lifelike appearance.

Denture Delivery and Follow-Up

The characterized complete dentures were inserted and evaluated for retention, stability, support, esthetics, phonetics, and occlusion (Figure 3). Minor occlusal adjustments were performed. Post-insertion instructions regarding hygiene maintenance, adaptation, and denture care were provided.

At follow-up visits conducted after 24 hours, one week, and one month, the patient reported satisfactory comfort and improved masticatory efficiency. No significant sore spots or functional complications were observed. The patient expressed high satisfaction with the natural appearance achieved through root carving and gingival characterization (Figure 4).

Figure 3: Final removable complete dentures - in patient's mouth

Figure 4: Post operative view

DISCUSSION

The present case demonstrates a simplified yet effective method of complete denture fabrication utilizing the patient's existing dentures as impression trays. This technique has been described as a practical alternative for patients who possess acceptable existing dentures with respect to vertical dimension and centric relation.[2,3]

Existing denture impression techniques allow the clinician to record the denture-bearing tissues under conditions that closely resemble function. Such methods can reduce treatment time and improve patient acceptance because the patient is

already accustomed to the existing prosthesis.[8] Furthermore, the technique minimizes the need for extensive border adjustments associated with conventional custom trays.

Addition silicone impression materials have become increasingly popular for complete denture impressions because of their dimensional stability, elasticity, and accuracy.[4] The putty-wash technique employed in the present case enabled effective border molding and precise tissue recording. Previous studies have reported that elastomeric impression materials provide superior detail reproduction and patient comfort compared with traditional impression compounds.[5]

The esthetic outcome of complete denture therapy significantly influences patient satisfaction. While retention and stability are critical for function, the appearance of the denture base also contributes to the overall success of treatment. Characterization techniques such as root carving, stippling, festooning, and pigmentation create a prosthesis that more closely resembles natural oral tissues.[6]

Frush and Fisher introduced the concept of dentogenic prosthodontics, emphasizing that complete dentures should replicate individual characteristics found in natural dentition.[9] Later studies highlighted the importance of gingival contouring and root prominence in producing realistic prostheses.[6,10] Root carving creates visual depth and shadow patterns that mimic natural alveolar anatomy, thereby reducing the artificial appearance frequently associated with conventional dentures.

The present case corroborates previous reports indicating that characterization improves patient acceptance and psychological satisfaction without significantly increasing laboratory complexity.[7,10] The combination of functional impression procedures and esthetic characterization resulted in a prosthesis that fulfilled both functional and cosmetic requirements.

CONCLUSION

Utilization of an existing denture as a custom impression tray represents a practical and predictable approach for complete denture rehabilitation. Border molding with addition silicone putty followed by a light-body wash impression allows accurate recording of the denture-bearing tissues and peripheral extensions. Incorporation of root carving and gingival characterization enhances the natural appearance of the prosthesis and contributes significantly to patient satisfaction. This technique provides a conservative, efficient, and esthetically rewarding treatment option for edentulous patients requiring replacement complete dentures.

REFERENCES

1. Zarb, G. A., Bolender, C. L., Eckert, S. E., Jacob, R. F., Fenton, A. H., & Mericske-Stern, R. (2013). *Prosthodontic treatment for edentulous patients* (13th ed.). Mosby.
2. Winkler, S. (2009). *Essentials of complete denture prosthodontics* (2nd ed.). AITBS Publishers.
3. Sharry, J. J. (1974). *Complete denture prosthodontics* (3rd ed.). McGraw-Hill.
4. Anusavice, K. J., Shen, C., & Rawls, H. R. (2013). *Phillips' science of dental materials* (12th ed.). Elsevier.
5. Boucher, C. O. (2004). *Boucher's prosthodontic treatment for edentulous patients* (12th ed.). Mosby.
6. Heartwell, C. M., & Rahn, A. O. (1986). *Syllabus of complete dentures* (5th ed.). Lea & Febiger.
7. Pound, E. (1951). Esthetic dentures and their phonetic values. *The Journal of Prosthetic Dentistry, 1*(1), 98–111.
8. Phoenix, R. D., Cagna, D. R., & DeFreest, C. F. (2008). *Stewart's clinical removable partial prosthodontics* (4th ed.). Quintessence Publishing.
9. Frush, J. P., & Fisher, R. D. (1955). Introduction to dentogenic restorations. *The Journal of Prosthetic Dentistry, 5*(5), 586–595.
10. Frush, J. P., & Fisher, R. D. (1956). How dentogenic restorations interpret the sex factor. *The Journal of Prosthetic Dentistry, 6*(2), 160–172.

CITATION

Arpit S., Ankit S., Annupriya S., Jyotsana S., & Kaur, K. (2026). Characterized Complete Denture Fabricated Using an Existing Denture as a Custom Impression Tray and Root Carving Technique: A Clinical Case Report. In Global Journal of Research in Dental Sciences (Vol. 6, Number 3, pp. 21–25).
https://doi.org/10.5281/zenodo.20830197