

Case Report

Rehabilitation of a Long-Term Complete Denture Wearer with Severe Mandibular Ridge Resorption Using a Maxillary Copy Denture and Conventional Mandibular Complete Denture Technique: A Case Report

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Received: 23.05.2026
Accepted: 11.07.2026
Published: 14.07.2026**Journal homepage:**
<https://www.easpublisher.com>**Quick Response Code**

Abstract: In elderly patients who have worn complete dentures for many years, preservation of favourable denture characteristics using the copy denture technique can facilitate neuromuscular adaptation. Combining a maxillary copy denture with a conventionally fabricated mandibular complete denture technique may restore occlusal vertical dimension, facial support, function, and patient satisfaction in patients with advanced mandibular ridge resorption. Long-term use of complete dentures frequently results in occlusal wear, reduction of the occlusal vertical dimension, loss of facial support, and progressive residual ridge resorption. Replacing these dentures using conventional techniques alone may require substantial patient adaptation, particularly in elderly individuals who have developed neuromuscular accommodation to their existing prostheses. This case report describes the rehabilitation of a 76-year-old completely edentulous man who had worn complete dentures for over 30 years. Clinical examination revealed severe occlusal wear, decreased occlusal vertical dimension, and a Cawood and Howell Class V mandibular residual ridge. A maxillary copy denture technique was selected to preserve acceptable tooth arrangement and polished surface contours, while a new mandibular denture was fabricated conventionally to optimize tissue adaptation and support. Following insertion, the patient demonstrated improved facial appearance, lip support, retention, mastication, speech, and overall satisfaction. This case illustrates that combining copy denture and conventional techniques is an effective patient-centered approach for managing elderly edentulous patients with severe mandibular ridge resorption.

Keywords: Complete denture; Copy denture; Residual ridge resorption; occlusal vertical dimension; Prosthodontics; Case report.

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INTRODUCTION

Complete edentulism remains an important cause of impaired mastication, speech, facial appearance, and quality of life among older adults. Progressive residual ridge resorption following tooth loss is a lifelong process and is generally more severe in the mandible than in the maxilla. Continued ridge resorption, together with wear of artificial teeth, frequently reduces the occlusal vertical dimension, resulting in compromised facial support, decreased masticatory efficiency, altered phonetics, and deterioration of denture stability.

Conventional complete denture fabrication remains the standard treatment for edentulous patients.

However, elderly patients who have successfully worn dentures for many years often develop neuromuscular adaptation to the position of the teeth, polished surface contours, and occlusal relationships of their existing dentures. Fabrication of entirely new dentures may therefore require prolonged adaptation and may reduce patient acceptance.

The copy denture technique allows clinicians to preserve favourable characteristics of an existing denture while correcting deficiencies such as worn teeth, poor fit, or loss of occlusal vertical dimension. The technique is particularly useful in long-term denture wearers with acceptable aesthetics but compromised function [1, 2, 3].

This report describes the successful rehabilitation of a patient with severe mandibular residual ridge resorption using a maxillary copy denture and a conventionally fabricated mandibular complete denture.

CASE PRESENTATION

A 76-year-old male retired accountant presented to the Prosthodontic Clinic requesting replacement of his complete dentures. His chief complaint was loss of lip support and an aged facial appearance associated with his existing dentures. He reported no difficulty with mastication or speech but was dissatisfied with the aesthetic appearance of the prostheses.

The patient had been completely edentulous for approximately 36 years following extraction of teeth due

to dental caries and periodontal disease. His present dentures had been worn for more than ten years, while he had been a complete denture wearer for over three decades.

Medical history was significant only for well-controlled bronchial asthma managed with inhaled formoterol. The patient neither smoked nor had significant systemic illnesses that contraindicated prosthodontic treatment.

Clinical examination demonstrated facial symmetry with moderate collapse of the perioral soft tissues and reduced lower facial height. Intraoral examination revealed healthy oral mucosa without evidence of denture-induced pathology. The maxillary residual ridge was classified as Cawood and Howell Class III, whereas the mandibular ridge exhibited advanced resorption corresponding to Class V.



Fig. 1: Maxillary residual ridge



Fig. 2: Mandibular residual ridge

Examination of the existing dentures revealed satisfactory extension and polished surface contours but generalized discoloration and severe occlusal wear of the

artificial teeth, resulting in decreased occlusal vertical dimension.



Fig. 3: Maxillary denture



Fig. 4: Mandibular denture

A panoramic radiograph confirmed generalized mandibular residual ridge resorption without other significant pathological findings.



Figure 5

Based on the clinical findings, the diagnosis included complete edentulism, decreased occlusal vertical dimension secondary to severe occlusal wear, advanced mandibular residual ridge resorption, and deterioration of existing complete dentures.

Treatment plan and sequences

Following discussion of available treatment options, a combined treatment approach was selected. The maxillary denture was duplicated using a copy denture technique because the patient wished to maintain the familiar tooth arrangement, lip support, and facial appearance. The mandibular denture was fabricated using conventional clinical procedures to optimize adaptation to the severely resorbed mandibular ridge.



Figure 6: Mandibular primary impression taken using impression compound, duplicating flask and acrylic denture teeth

A mandibular primary impression was obtained using impression compound. The existing maxillary denture was duplicated in a dental duplicating flask using

alginate, and an auto polymerizing acrylic resin duplicate was fabricated to serve as a custom impression tray.



Fig. 7: Secondary impression of maxillary and mandibular jaw

Border molding was completed using impression compound sticks, followed by definitive impressions with zinc oxide eugenol impression paste.

Master casts were prepared, and a mandibular record base with wax occlusion rim was fabricated. The copied maxillary denture served as the maxillary record base.

Jaw relations were established after correction of the occlusal vertical dimension. The occlusal plane was verified using the interpupillary line and ala-tragus

reference line. The casts were mounted on a semi-adjustable articulator, and acrylic teeth were arranged according to the recorded jaw relationship.



Fig. 8: Wax rim in jaw registration

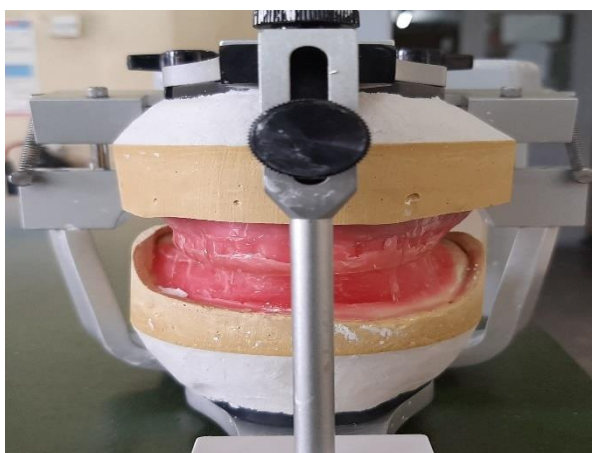


Fig. 9: Wax rim mounted on the articulator for mounting of teeth

At the wax try-in appointment, aesthetics, phonetics, lip support, and occlusion were evaluated. Minor occlusal discrepancies were corrected before processing the dentures.

Following insertion, selective occlusal adjustments were performed to eliminate premature contacts. The patient received instructions regarding denture hygiene, overnight removal, and adaptation.

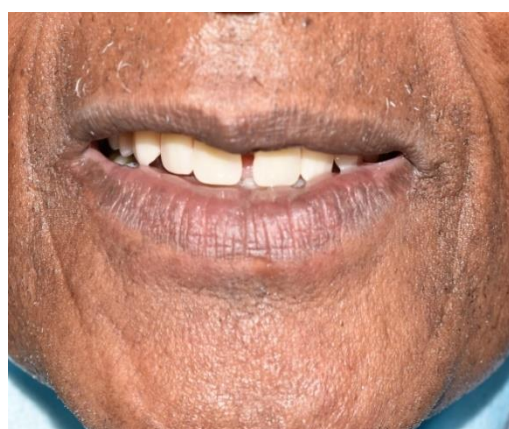


Fig. 10: Frontal and smile view retracted with denture inserted

Outcome and Follow-up

One week after insertion, the patient reported substantial improvement in facial appearance, lip support, chewing ability, and overall comfort. Only minor discomfort near the lingual frenum was reported

and was successfully managed by selective adjustment of the denture flange.

At review, both dentures demonstrated satisfactory retention, stability, and support. The patient

expressed satisfaction with the aesthetic appearance, restoration of facial profile, and improved oral function.

DISCUSSION

Management of elderly complete denture wearers requires careful consideration of both anatomical changes and long-standing neuromuscular adaptation. Although conventional complete denture fabrication remains the gold standard, abrupt alteration of familiar denture characteristics may reduce patient acceptance [4].

The present case demonstrates the clinical value of selectively combining the copy denture technique with conventional complete denture fabrication. The copied maxillary denture preserved favourable polished surface contours, tooth arrangement, and aesthetics, thereby facilitating neuromuscular adaptation. In contrast, fabrication of a new mandibular denture using conventional procedures allowed accurate recording of the severely resorbed mandibular ridge and restoration of support.

Restoration of the occlusal vertical dimension improved lower facial height and lip support without compromising patient adaptation. The favourable outcome observed in this patient supports previous reports that copy dentures can simplify treatment of experienced denture wearers while preserving successful features of the original prosthesis [5].

This case also emphasizes that treatment selection should be individualized according to residual ridge morphology, existing denture quality, and patient expectations rather than applying a single technique universally.

CONCLUSION

A combined maxillary copy denture and conventional mandibular complete denture approach successfully rehabilitated an elderly long-term denture wearer with severe mandibular ridge resorption. Preservation of favourable characteristics of the existing maxillary denture facilitated patient adaptation, while conventional fabrication of the mandibular denture restored retention, support, occlusal vertical dimension, and facial aesthetics. This conservative patient-centred approach may be considered in similar clinical situations involving elderly complete denture wearers.

Patient Perspective

The patient expressed satisfaction with the improved appearance, lip support, comfort, and chewing ability and reported that adaptation to the new dentures

was easier than expected because the upper denture felt familiar.

Learning Points

- Copy dentures preserve favourable characteristics of existing dentures in experienced denture wearers.
- Conventional mandibular denture fabrication remains appropriate for severely resorbed mandibular ridges.
- Restoration of occlusal vertical dimension improves facial support and aesthetics.
- Individualized treatment planning enhances patient adaptation and satisfaction.

Compliance with Ethical Standards

Disclosure of Conflict of Interest: I declare no conflicts of interest.

Statement of Ethical Approval: All procedures in this case report were in accordance with the ethical standards of Kitete Regional Referral Hospital

Statement of Informed Consent: Written informed consent was obtained from the patient to publish this case report in accordance with the journals patient consent policy.

Funding: No external funding was received for this work.

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Cite This Article: Elisha Kihembe Ndakama & Ibrahim Kasambala (2026). Rehabilitation of a Long-Term Complete Denture Wearer with Severe Mandibular Ridge Resorption Using a Maxillary Copy Denture and Conventional Mandibular Complete Denture Technique: A Case Report. *EAS J Dent Oral Med*, 8(4), 140-144.
