

Management Of Overdenture In A Case Of Partial Maxillary Tooth Loss And Complete Mandibular Tooth Loss

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ABSTRACT

Keywords:

Overdenture, short coping, excessive tooth loss, removable partial denture

Background: Extensive tooth loss may impair masticatory function, esthetics, and quality of life, and can accelerate alveolar bone resorption. Overdentures represent a prosthodontic treatment option that preserves remaining teeth or root remnants as supporting structures, thereby improving prosthesis stability and maintaining the supporting tissues. To report the management of extensive tooth loss using tooth- and root-supported overdentures, with consideration of clinical conditions and patient preferences.

Case Report: A 53-year-old male patient presented with a chief complaint of difficulty in mastication due to extensive tooth loss in the maxillary and mandibular arches. Clinical and radiographic examinations revealed the presence of several teeth and root remnants with periodontal conditions that were still suitable for preservation. The treatment was performed in stages, including periodontal and endodontic therapy, extraction of teeth with poor prognosis, and prosthodontic rehabilitation using removable partial dentures combined with bare-root overdentures and non-retentive short coping overdentures.

Results: After prosthesis insertion, the patient demonstrated improved masticatory function, comfort, and overall satisfaction. Clinical evaluation showed good adaptation, retention, and stability of the overdentures, with no complaints of pain or soft tissue irritation.

Conclusion: Tooth- and root-supported overdentures are an effective treatment option for patients with extensive tooth loss when suitable abutments remain. This approach provides favorable functional and psychological outcomes when supported by appropriate preliminary treatment and regular maintenance.

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INTRODUCTION

Prosthodontics is a speciality of dentistry that not only focuses on functional and esthetic rehabilitation but also plays a significant role in long-term preventive care. Preventive principles in prosthodontics emphasize the importance of preserving existing hard and soft tissues to minimize future complications. One approach aligned with this principle is the preservation of natural teeth or root remnants whenever biologically feasible, thereby delaying or preventing complete edentulism.^{1,2}

Complete tooth loss leads to various problems, including loss of dental proprioception, alveolar bone volume reduction, and most notably, decreased patient self-confidence. These considerations gave rise to the concept of overdentures.^{2,3}

According to *The Glossary of Prosthodontic Terms*, an overdenture is defined as a removable partial or complete denture that covers and is supported by one or more remaining natural teeth, tooth roots, and/or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, tooth roots, and/or dental implants.⁴ Tooth-supported overdentures are often indicated in cases with only a few remaining teeth in the dental arch. They are relatively simple, non-invasive, and cost-effective, making them a favorable treatment option.⁵

In addition to overdentures, periodontal health is another critical factor in achieving preventive prosthodontic treatment. Long-term success of prosthodontic therapy depends on maintaining healthy periodontal tissues so that abutment teeth can be preserved.⁶

In many cases of tooth loss, the remaining abutment teeth are not in optimal condition. One unfavorable condition is tooth mobility or periodontitis, which makes the prognosis of the remaining teeth or prosthesis worse.⁷

The success of overdenture treatment largely depends on the periodontal condition of the abutment teeth. Therefore, integration of prosthodontic and periodontal principles is crucial, especially in patients with a history of periodontitis or tooth mobility. Adequate preliminary treatment and prosthesis design that provides a splinting effect are essential to ensure long-term preservation of abutment teeth. This case report discusses the management of maxillary and mandibular tooth loss using overdenture and perio-prosthetic approaches, along with clinical considerations underlying treatment selection.⁸ This report describes the management of maxillary tooth loss with non-retentive overdentures and mandibular tooth loss with a perio-prosthetic metal framework prosthesis.

CASE REPORT

A 53-year-old male patient presented to the Prosthodontics Clinic of RSGM Unpad with a chief complaint of difficulty in mastication due to the loss of most teeth and the presence of several root remnants. The patient expressed a desire to receive dentures and emphasized that any teeth that could still be preserved should not be extracted. He had never used dentures previously and reported no systemic disease.

Extraoral examination revealed good general condition, a flat facial profile, and no abnormalities in the temporomandibular joints or lymph nodes. Intraoral examination showed extensive tooth loss in the maxillary arch and complete posterior tooth loss in the mandibular arch, accompanied by root remnants, extensive caries, and advanced tooth mobility in several teeth. Oral hygiene was moderate, and no excessive gag reflex was observed.



Figure 1. Intraoral condition of the maxillary and mandibular arches

Panoramic radiographic examination demonstrated varying levels of alveolar bone support in the remaining teeth. Based on clinical and radiographic findings, the maxillary tooth loss was classified as Kennedy Class I, while the mandibular arch was completely edentulous. Several teeth were diagnosed with necrosis, deep caries, and periodontitis with grade III mobility.



Figure 2. Panoramic Radiograph

Preliminary treatment was performed in stages, including periodontal therapy with scaling and root planing, endodontic treatment of salvageable teeth,

restoration of teeth with moderate caries, and extraction of teeth with poor prognosis.



Figure 3. Obturation result of teeth 42,12,22,23

Once the soft tissues and abutment teeth were deemed stable, prosthodontic treatment planning was initiated.

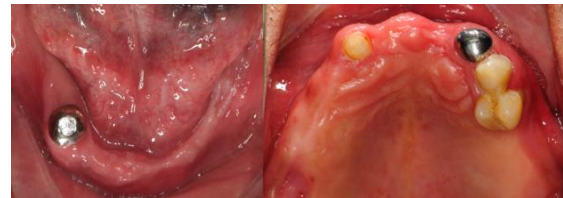


Figure 4. Placement of a short coping overdenture

The definitive treatment plan included fabrication of a maxillary removable partial denture with a metal framework combined with bars overdentures and non-retentive short-coping overdentures on selected teeth. For the mandibular arch, an acrylic removable denture with short coping overdentures was planned.

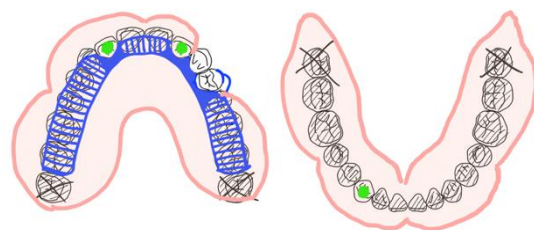


Figure 5. Treatment planning design

Clinical procedures included diagnostic impressions, preparation of overdenture abutment teeth, fabrication and cementation of non-retentive overdenture copings, functional impressions using custom trays, and fabrication of the maxillary metal framework.

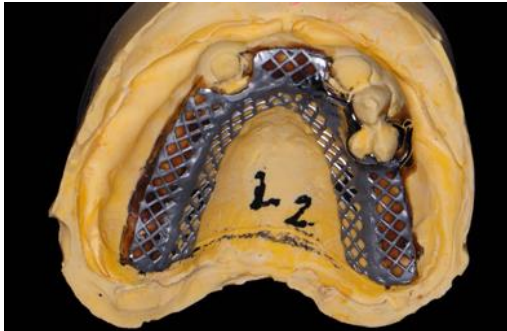


Figure 6. Maxillary metal framework

Maxillomandibular relationship and vertical dimension were determined using the two-dot technique, followed by tooth arrangement with a bilateral balanced occlusal scheme. After try-in and final laboratory processing, the dentures were inserted, and adaptation, retention, stability, and occlusion were evaluated. The patient received instructions regarding denture use and maintenance and was scheduled for regular follow-up visits.

At the follow-up visit, the patient reported improved masticatory function and comfort. Clinical examination demonstrated good prosthesis adaptation with no complaints of pain or soft tissue irritation.



Figure 7. Before denture insertion.



Figure 8. After denture insertion and mastication trial

DISCUSSION

Prosthetic rehabilitation in patients with extensive tooth loss requires comprehensive consideration of biological, biomechanical, functional, and psychological factors. In this case, the presence of several teeth and root remnants suitable for preservation formed the basis for selecting overdentures as the primary treatment option. This approach aligns with preventive prosthetic principles that emphasize preservation of supporting tissues whenever clinically feasible.⁹

The decision to retain teeth and root remnants as overdenture abutments is supported by evidence showing that endodontically treated roots can slow alveolar bone resorption. Burns et al. reported favorable clinical performance of root-supported overdentures for up to five years, with better preservation of supporting tissues compared to conventional complete dentures.¹⁰ Additionally, remaining periodontal tissues allow more physiological transmission of functional loads and improved neuromuscular control during mastication.³

In the maxillary arch, a combination of bare-root overdentures and non-retentive short coping overdentures was employed. Bare-root overdentures were used on teeth with minimal bone support to preserve roots as passive supports to

reduce alveolar bone resorption. Kaur et al. reported that bare-root overdentures may be a rational option for teeth with limited prognosis, provided infection is controlled and regular follow-up is maintained.³ This minimally invasive and technically simple approach was appropriate for the biological conditions of the abutment teeth in this case.

Non-retentive short copings were selected for teeth with more stable periodontal conditions to protect hard dental tissues from abrasion, secondary caries, and fracture due to direct contact with the denture base. Mattoo and Deep stated that short copings with a height of 2–3 mm are sufficient to provide mechanical protection without increasing the risk of excessive lateral forces on abutment teeth.¹⁰ This consideration was particularly important given the unfavorable alignment of abutment teeth for active retentive systems such as telescopic crowns or precision attachments.

Leong et al. reported that tooth-supported overdentures without additional retentive elements yield satisfactory clinical outcomes in patients with moderate periodontal conditions, especially when the primary treatment goals are prosthesis stability and ease of oral hygiene maintenance.¹¹ Oral hygiene maintenance is a critical factor in the long-term success of overdentures, particularly in patients with a history of periodontal disease.

Alternative treatments such as conventional complete dentures are associated with limitations including accelerated alveolar bone resorption and loss of periodontal proprioception. Zitzmann and Hagmann reported significant changes in supporting tissues in edentulous patients, particularly during the early years of complete denture use.¹² Moreover, this approach was

inconsistent with the patient's preference to retain remaining teeth.

The use of a metal framework with a mesh design in the maxillary arch provides biomechanical advantages by distributing occlusal loads more evenly and enhancing the mechanical retention of the acrylic base. Malik and Yazdanie emphasized that appropriate perio-prosthetic design can provide a passive splinting effect on abutment teeth and improve prosthesis stability, particularly in cases of bilateral posterior tooth loss.¹³

From a psychological perspective, overdentures offer higher patient satisfaction compared to complete dentures. Sadowsky reported that overdenture patients tend to demonstrate better acceptance and adaptation due to the preservation of natural teeth.⁷ This was also evident in the present case, where the patient reported increased comfort and self-confidence following prosthesis use.

CONCLUSION

Overdentures can be an effective treatment alternative in cases where abutment teeth in the form of root remnants or severely damaged teeth remain. Overdentures enhance denture stability and retention, reduce alveolar bone resorption, and improve psychological outcomes. In cases with mobile abutment teeth, perio-prosthetic prostheses may serve as a simple and non-invasive treatment option. Patient oral hygiene and regular follow-up are key factors for long-term treatment success.

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