Treatment of partial mandibular edentulous patients using a partially removable prostheses with extracoronal attachments

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ABSTRACT

The management of uni- or bi-terminal edentulous cases in patients who cannot undergo implant-prosthetic treatment is complex and challenging, often requiring a multidisciplinary approach. Correct diagnosis, paraclinical investigations (retroalveolar radiographs, CBCT, blood tests), and a well-elaborated treatment protocol are usually necessary to achieve a predictable and successful outcome.

The objective of complete rehabilitation of an arch includes identifying the cause, preventing, and conserving the remaining dental structure.

This case study presents an interdisciplinary endo-prosthetic management through endodontic retreatment followed by the realization of a removable prosthesis restoration with extracoronal attachments. The prosthetic restoration yielded excellent functional and aesthetic results.

Background. Oral rehabilitation of patients who cannot benefit from implant-prosthetic treatment.
Case report. Restoration of the mandible using removable prostheses with extracoronal attachments.
Conclusions. Removable prosthetic restorations remain a treatment solution in the era of implant prosthetics.

Keywords: removable prosthesis, extracoronal attachments, lingual bar, hybrid prosthesis

INTRODUCTION

The main purpose of dental prosthetics is to restore the function, form, and appearance of the patient by creating a prosthetic restoration that replaces missing teeth and adjacent tissues. Various treatment options exist for partial edentulism, such as: acrylic removable partial dentures, removable partial dentures with attachments or special systems, or prosthetic restorations on implants.

In clinical situations with intact teeth and ample bone support, the preferred treatment plan would be implant-prosthetic, but this often cannot be applied due to various general health problems or the patient’s financial situation.

These are some reasons why removable prosthetic restorations remain an optimal treatment option to restore affected hard and soft tissues, achieve aesthetic restoration, phonetics, psychological com-
fort, and better hygiene. Hybrid prosthetic restorations meet rehabilitation objectives by combining the aesthetic, stability, and retention characteristics of fixed prostheses with the hygiene maintenance of a removable prosthesis [1].

However, the future design of a mobilizable prosthetic restoration with special systems remains a particular concern due to the even distribution of forces, ensuring that remaining teeth and alveolar ridges can be maintained in an optimal state of health, providing patients with better comfort and functionality of the dento-maxillary apparatus [2].

**CASE REPORT**

A 63-year-old patient presented at the Clinical Center for Dental Medical Assistance of Titu Maiorescu University, Faculty of Dental Medicine, dissatisfied with the fixed prosthetic restoration made in quadrant 3 three months ago. She had uni-terminal edentulism in quadrant 4, requesting implants.

Intraoral clinical examination (Figure 1) revealed the presence of two metal-acrylic fixed prosthetic restorations at maxilla, with teeth 1.7, 1.4 as abutments, 1.6, 1.5 as intermediates, and 2.5, 2.7 as abutments, and 2.6 as an intermediate, improperly adapted and unaesthetic.

Fissures in enamel were observed at 1.1, 2.1, and abfraction at 2.3.

At mandible, there was a fixed prosthetic restoration with teeth 3.4, 3.5, 3.7 as abutments, and 3.6 as an intermediate, marginally poorly adapted, with occlusal adaptation extending to the metal on 3.4 and 3.5. Teeth 4.4-4.8 were missing in quadrant 4.

On the orthopantomography (Figure 2), the presence of tooth 2.8 was observed to be submucosally impacted, with a distal carious lesion noted at tooth 1.8, incorrectly performed endodontic treatments

![FIGURE 1. The initial intraoral situation. A. Occlusal view – maxilla; B. Occlusal view – mandible](image1)

![FIGURE 2. The initial situation (OPG)](image2)
(underfilling) at teeth 3.4, 3.5, 3.7, and the presence of metallic restorations at teeth 3.4 and 3.5, while tooth 3.7 exhibited a glass fiber post.

During the consultation, the patient reported having hypertension and type II diabetes, both under medication (Siofor 1000mg, Torvacard 10mg, Noliprel 5mg). For this reason, implant insertion was not recommended for the patient following blood tests.

After discussing treatment options with her, she decided to treat only the mandibular arch for the time being due to financial considerations, planning to replace old restorations in the maxilla in the future. Therefore, it was decided to proceed with a removable prosthetic restoration with extracoronal attachments, an occlusal rest at tooth 3.7, and a lingual bar as the main connector.

The first stage of treatment involved professional cleaning, followed by impressions to create a study model and a silicone key necessary for obtaining a provisional restoration using the Scutan technique. Putty silicone from Zetaplus Zhermack was used during this stage.

After removing the prosthetic from quadrant 3, in collaboration with the Endodontic Department team, endodontic retreatments of teeth 3.4, 3.5, and 3.7 were done.

In the next treatment stage, teeth 3.4 and 3.5 were prepared and impressed for metal restorations. The impression was taken with Putty silicone + fluid Zetaplus Zhermack in two steps. The DCR were cemented with glass ionomer cement GC Fuji I.

Teeth 3.7, 3.5, 3.4, 3.3, 3.2, 3.1, 4.1, 4.2, 4.3 were polished, gingival retraction cord was inserted, and both the mandibular and maxillary arches were impressed using the sandwich technique (silicone with very high viscosity and high consistency + silicone with low viscosity and fluid consistency – Variotime, Kulzer). Intermaxillary relationships were recorded with silicone Putty, ZetaPlus Zhermack. Provisional restoration was made using the Scutan technique with a self-polymerizing resin (Dentocrown, Itena).

After verifying the metal framework intraorally and layering the unglazed ceramic (color A3), a functional impression was taken with individual tray using low viscosity and medium consistency silicone (Variotime medium flow, Kulzer), in one step.

Intermaxillary relationship registration for the mobilizable component was done using the occlusal template, recording the maximal intercuspal position (PIM). This was followed by the intraoral wax mock-up trial, during which static and dynamic occlusion were checked. The fixed component of the prosthetic restoration with special system (3.7, 3.5-4.3) was cemented with glass ionomer cement GC Fuji I (Figures 3, 4).

DISCUSSION

Mutually protected occlusion was used in this case, as the patient had healthy periodontal anterior teeth. Mutual protection refers to the role of anterior teeth in the protrusive movements of the mandible, causing disocclusion of posterior teeth. Conversely, in lateral movements of the mandible,
posterior teeth protect the anterior teeth by disclosing them [3]. Group guidance should be used when anterior teeth are compromised periodontally or when canines are missing [4,5]. Extracoronal attachments were used in this case to ensure uniform pressure on the remaining natural teeth, easier hygiene maintenance, improved aesthetics, and exceptional patient comfort [6]. In this case, the removable part exhibited excellent stability during functional activities because the initially used yellow retentive fit caps for patient accommodation were replaced with red ones, which are harder. To ensure optimal denture retention, both adequate attachments precision and a large contact surface between the “male” and the “female” components are essential [7]. This contact surface is influenced by the size of the attachments and, implicitly, by the size of the tooth on which the attachments are mounted [8].

The patient was recalled after 1, 3, 6, and 10 months. The restoration (Figure 4) showed no signs of deterioration, and the final result was satisfactory to the patient. The case presentation describes the method and approach applied for the complete rehabilitation of the mandibular arch.

**CONCLUSION**

Removable prosthetic restorations with extracoronal attachments have many advantages and disadvantages. Therefore, dentists must be careful during the treatment planning of partially edentulous patients. They need to carefully evaluate the remaining teeth and consider the higher cost and prolonged time required for manufacturing removable prostheses. The clinical and laboratory stages must be precise, and the dental technician plays a major role in the success or failure of the prosthesis due to the technical requirements of the process of making removable prostheses with extracoronal attachments. Removable prosthetic restorations remain a treatment solution in the era of implant prosthodontics. The patient was very satisfied with the improvement in aesthetics, function, and quality of life.

**Acknowledgments:** all authors contributed equally to the manuscript.

**REFERENCES**