

# PROSTHETIC REHABILITATION USING MAXILLARY IMMEDIATE DENTURE AND MANDIBULAR TOOTH-SUPPORTED OVERDENTURE WITH MICRO OT ATTACHMENTS: A CASE REPORT

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## ABSTRACT

Tooth loss can significantly affect function, esthetics, and overall quality of life. Prosthodontic rehabilitation plays a key role in restoring oral health, appearance, and confidence. This case report outlines the treatment of a 42-year-old male patient with multiple periodontally compromised teeth. An immediate complete denture was planned for the maxillary arch to avoid a period of edentulism and maintain facial support. In the mandibular arch, selected teeth were retained and restored with short copings and micro OT cap attachments to support an overdenture. This approach offered improved retention, stability, and preservation of alveolar bone. Follow-up visits were scheduled at regular intervals, with relining done at six months. At the one-year review, the prostheses were functioning well, and the oral tissues remained healthy. This case emphasizes the

importance of timely intervention, preservation of remaining teeth, and careful planning to achieve long-term success in prosthetic rehabilitation.

**Key-words:** Immediate denture, overdenture

## INTRODUCTION

Complete and partial edentulism are the major contributing factors for compromised oral health. Epidemiological data indicate that partial edentulism affects approximately 50% to 59% of individuals,<sup>1</sup> often leading to reduced masticatory function, aesthetic concerns, social withdrawal, nutritional deficiencies, and psychological challenges. Collectively, these factors can substantially affect a person's overall quality of life. Prosthodontic treatment aims to rehabilitate such patients by restoring oral function,

appearance, and comfort through appropriate prosthetic solutions. A wide array of treatment modalities is available, including removable dentures, fixed dental prostheses, and implant-supported restorations. Among these, tooth-supported overdentures represent a vital component of preventive Prosthodontics, offering the benefits of preservation of alveolar bone and proprioception while fulfilling both functional and aesthetic requirements.

An overdenture is a removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants. It is a dental prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and/or dental implants. It is also termed as an overlay denture or overlay prosthesis. <sup>2</sup>Retention of natural teeth contributes to the preservation of alveolar bone height, periodontal proprioception, thus modulating the occlusal forces and better control and function during mastication. <sup>3</sup>Moreover, tooth-supported overdentures can offer superior retention and stability when compared to conventional complete dentures, particularly when enhanced with attachment systems. These mechanical components are designed to secure the removable prosthesis effectively, making them beneficial in patients with sufficient interarch space.<sup>4</sup>

In consideration of the patient's aesthetic needs and psychological well-being, an immediate complete denture is a treatment solution. This prosthesis is fabricated before the extraction of the remaining natural teeth and is inserted immediately following their extraction. This eliminates the period of edentulism, preserving facial appearance, supporting soft tissues, and

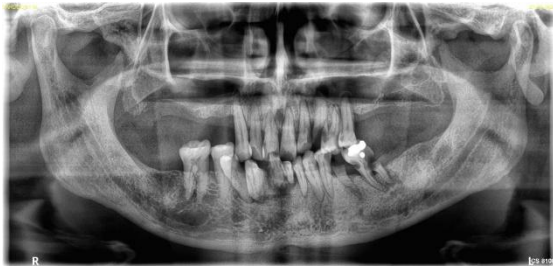
maintaining the patient's appearance and social confidence during the healing phase.<sup>5,6</sup> Immediate dentures also assist in protecting extraction sites, promoting uneventful healing, and enabling early adaptation to the prosthesis. However, they may require periodic adjustments or relining due to post-extraction ridge remodeling. The present case report describes a comprehensive oral rehabilitation in which the maxillary arch was restored with an immediate complete denture, while the mandibular arch was managed using a tooth-supported overdenture incorporating a micro OT cap attachment system for improved retention and stability.

### **Case History:**

A 42-year-old male patient reported to the Department of Prosthodontics with the chief complaint of seeking complete oral rehabilitation following total extraction of the remaining teeth.

Extraoral evaluation revealed that the patient has a square tapering facial form, with a convex profile. Adequately supported, potentially competent lips with a length of 26mm.

Intraoral examination revealed Grade III mobility in teeth 21, 11, 12, 13, 31, and 41, and Grade II mobility in 42 and 43. Teeth 36 and 37 were grossly decayed, and tooth 46 showed signs of furcation involvement. The patient was partially edentulous with missing teeth 12, 13, 14, 15, 16, 17, 24, 25, 26, 27, and 47. Considering the poor periodontal condition and the patient's concern regarding aesthetics, extraction was advised for the remaining compromised mandibular teeth: 31, 32, 33, 35, 36, 37, 41, 42, 43, 44, and 46.



Pre-operative Orthopantograph



Pre-operative intra oral picture

During the initial visit, diagnostic impressions were made using Zhermack Tropicalgin alginate for both arches. Tentative jaw relation was recorded. Given the available interarch space, a Rhein 83 micro OT cap attachment system was planned for the mandibular arch. Considering the mobility, total extraction was planned with the maxillary arch.

In the subsequent appointment, post space preparation was carried out with teeth 35 and 44. Dome shaped preparation with chamfer finish margin and anti-rotational groove was prepared for the fabrication of short coping. Final impressions were made, and wax patterns for the cast posts and copings were fabricated. The micro OT cap attachments were positioned using a paralleling device to ensure proper alignment. The entire assembly was then casted together. After finishing and polishing, the cast posts were cemented using 3M Relyx resin cement.



Tooth preparation for cast post with short coping



Casted post with coping and micro OT attachment



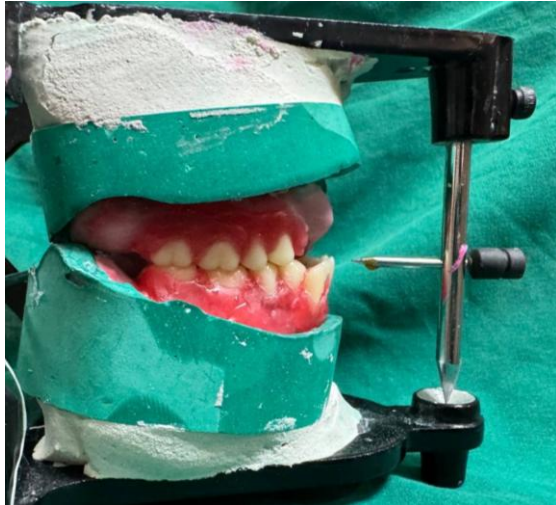
Cemented cast post with coping and attachment

After cementation, a secondary impression was made with Zhermack Light body impression material. On the master cast, denture base and occlusal rims were fabricated, and centric relation was recorded.

Posterior teeth arrangement was completed. During the try-in, the vertical dimension of



occlusion and centric relation were verified. Anterior tooth selection was confirmed with the patient based on esthetics and lip line.



Lower anterior and upper posterior teeth arrangement in mean value articulator

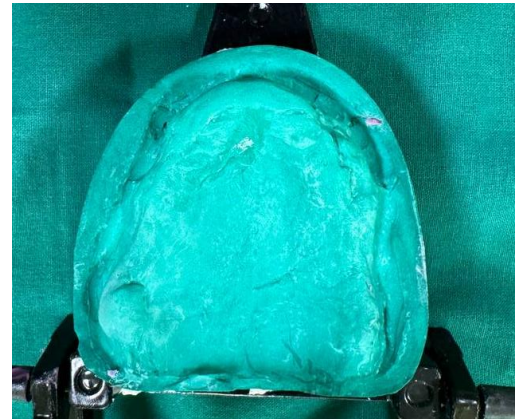


Posterior try-in

Following the try-in, the maxillary cast was modified based on the “rule of thirds” as recommended by Kelly.<sup>7</sup> A surgical template was fabricated to serve as a reference during the surgical phase.



Rule of thirds-Cast modification



Modified maxillary master cast

The anterior teeth setup was completed. Standard processing steps, including wax-up, dewaxing, packing, curing, finishing, and polishing, were performed.



Teeth arrangement-mean value articulator



Acrylised, polished maxillary and

## mandibular complete denture

On the day of prosthesis insertion, the maxillary anterior teeth were extracted. The surgical template was used as a reference for alveoplasty. Suture placement was done.



Clear acrylic resin template used for bone recontouring following extraction



Post-extraction alveoplasty using surgical template

After haemostasis and suture placement, the immediate complete denture was inserted in the maxillary arch. For the mandibular arch, the copings were isolated with a separator, exposing only the matrix component of the micro OT cap attachment to prevent acrylic entrapment during pick-up. The standard retention sleeves were placed on the matrix intraorally. Adequate relief was created in the intaglio surface of the mandibular denture to accommodate the

matrix portion of the attachment. After confirming accurate fit and occlusion, chairside pick-up of the matrix component was performed using self-cure acrylic resin. Excess material was trimmed and polished before final insertion.



Placement of retentive sleeve and matrix component



Mandibular denture with the matrix component, after chairside pickup

The patient was advised not to remove the maxillary denture for the first 24 hours post-insertion, as early removal could lead to soft tissue inflammation and compromise the proper seating of the prosthesis. Post-insertion instructions were provided in detail, and a follow-up appointment was scheduled after 24 hours to evaluate tissue response and prosthesis adaptation.<sup>6</sup>





Maxillary immediate denture and mandibular overdenture insertion

## DISCUSSION

Preventive prosthodontics emphasizes preserving existing oral structures. Overdentures serve as a key modality in this approach. Complete edentulism significantly impacts one's personality, appearance, and diet, making timely treatment essential. As DeVan stated, Perpetual preservation of what remains is more important than the meticulous replacement of what is missing.<sup>6</sup> Unlike conventional prostheses, retained natural teeth provide proprioception through the periodontal ligament, allowing better occlusal awareness and reducing excess forces. Overdentures improve support, chewing efficiency, and delay ridge resorption. Prieskel described three abutment preparations: (a) reduced root surfaces (bare or dome-shaped copings), (b) use of attachments, and (c) thimble-shaped copings.<sup>8</sup> The success of the treatment depends on favorable alignment of abutment teeth (parallel or nearly parallel), well-positioned (canine or premolar region) to ensure a common path of insertion. Considering the inter-arch space and available favourable abutments, short coping with micro-OT attachments<sup>10</sup>, standard clear retention sleeves were chosen in this case.

Immediate dentures are a dependable treatment option when proper case selection, planning, surgical technique and procedures are followed with good patient cooperation. When full extractions are needed, a clear acrylic surgical stent can guide bone recontouring, ensuring a better fit of the denture post-extraction. These dentures offer benefits such as protecting surgical sites, reducing bleeding, and maintaining appearance, as natural teeth help in guiding acrylic tooth placement.<sup>9</sup>

However, there are certain drawbacks

- Impression making and jaw relation records can be difficult due to remaining teeth.
- Anterior ridge undercuts may interfere with impressions.
- Uneven distribution of remaining teeth can lead to errors in recording centric relation or vertical dimension.
- The process requires more appointments, time, and cost.
- Lack of anterior try-in procedure for an immediate complete denture.
- Post-insertion adjustments or even complete remakes may be needed if major corrections are required.<sup>9</sup>

Patients must wear the denture continuously for the first 24 hours without removing it; otherwise, reinsertion might be difficult. As the supporting tissues heal and reshape, the denture may loosen over time, requiring refitting or relining, which involves additional cost. Because of the patient's age and the importance of maintaining esthetics, an immediate complete denture was provided for the maxillary arch. Post-insertion reviews were conducted at 24 hours, 1 week, and 3 months. At the 6-month visit, relining was done using heat-cured acrylic resin. Evaluation at the 1-year follow-up revealed satisfactory denture condition and tissue

response.

## CONCLUSION

Tooth-supported overdentures offer a functional and biologically sound approach for managing patients with remaining compromised teeth. By preserving natural abutments and utilizing attachment systems, they enhance prosthesis retention, stability, and proprioception. Immediate dentures, when properly planned, help maintain aesthetics and function without subjecting the patient to an edentulous phase. The combined use of a maxillary immediate denture and mandibular overdenture with micro OT attachments in this case provided an effective, patient-centric solution, restoring oral function and appearance while supporting long-term tissue health.

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