# ENHANCING FUNCTION WITH TOOTH SUPPORTED OVER DENTURE: A CASE REPORT

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#### Abstract:

The primary aim of prosthodontics is to deliver a functional prosthesis that restores aesthetics, functionality, and masticatory efficiency. Among the treatment options for removable dentures, tooth-supported overdentures stand out as a viable choice. Overdentures are a widely preferred treatment for elderly patients who retain two or more teeth in their dental arch. By utilizing copings or attachments over the remaining tooth structures, the roots help preserve the alveolar ridge, enhance sensory perception, and improve the

stability and retention of the denture compared to traditional complete dentures. This article describes the rehabilitation of a 55-year-old partially edentulous male patient who presented with concerns about poor aesthetics and difficulty in chewing due to missing teeth.

**Conclusion**: Tooth-supported overdentures retained with extra-radicular attachments enhance the stability and retention of the denture. This approach improves chewing efficiency, ensures greater patient comfort, and minimizes residual ridge resorption. **Keywords**: Attachment, tooth-supported over-denture, resorbed ridge, extra-coronal ball attachment, conventional complete denture, retention, stability

#### **Introduction:**

Preventive Prosthodontics focuses on procedures aimed at delaying or preventing future prosthodontic challenges. Overdentures serve as significant a treatment option in this context. Patients transitioning to complete dentures often face a series of issues, including the loss of tooth proprioception, gradual resorption of alveolar bone, and the shift of occlusal forces to the oral mucosa. These changes can lead to psychological impacts, such as diminished self-confidence [1].

Overdentures are particularly beneficial for individuals with a few retainable teeth remaining in an arch. They are also suitable for cases with malaligned ridges, patients requiring a single denture, or those with challenging anatomical conditions such as unfavorable tongue positions, high palatal vaults, or muscle attachments that complicate prosthesis stability and retention [2-5].

The use of overdentures helps reduce bone resorption, enhances the denture foundation area, and improves chewing efficiency. Compared traditional removable to complete dentures, which come with certain limitations, overdentures are a superior alternative. A study by Renner et al. showed that 50% of roots used as abutments for overdentures remained stable after four years [6]. In overdenture therapy, the retained teeth contribute to the residual ridge structure, and an essential periodontal requirement is an adequate zone of attached gingiva for the abutments [3, 7, 8]. The treatment possibilities with tooth-supported overdentures are extensive, offering a variety of options tailored to different clinical scenarios.

#### Case Report:

A 55-year-old male patient presented to the Department of Prosthodontics with a

primary complaint of missing upper front and back teeth for the past six months. His medical history revealed multiple decayed teeth, which had been extracted without complications over the previous year. The patient reported difficulty chewing and expressed concerns about his appearance, requesting replacement of his missing teeth.

Intraoral examination showed a partially edentulous maxillary arch with only two remaining teeth, 13 and 23, along with normal alveolar ridge mucosa. The mandibular arch exhibited generalized attrition and decay around tooth 36. Following a comprehensive evaluation of the patient's dental condition, a toothsupported overdenture was planned for the maxillary arch.

Tooth preparation was carried out for teeth 13 and 23. Diagnostic impressions were taken using irreversible hydrocolloid (Tropicalgin, Zhermack) for the mandibular arch and impression compound for the partially edentulous maxillary arch. A custom tray for the maxillary arch was fabricated with autopolymerizing resin on the diagnostic model.

Post-space preparation was performed on both teeth, and a 21-gauge stainless steel wire loop was used to record the post-space impression. Border molding was completed with green stick compound, followed by a wash impression using monophase impression material.

A master cast was obtained and sent to the laboratory for wax pattern fabrication. Metal copings with ball attachments were fabricated and cemented on teeth 13 and 23. An elastomeric wash impression was taken with the copings seated intraorally. This was followed by the fabrication of a denture base. Jaw relation records were obtained, and a trial denture setup was evaluated.

The final denture was processed with nylon housing incorporated for the ball attachments. It was inserted into the patient's mouth after occlusion verification, along with detailed post-operative instructions. The patient was recalled after 24 hours for evaluation of esthetics, phonetics, function, and overall comfort. Follow-up appointments were conducted at 1 week, 1 month, and subsequently every 6 months. The patient reported a satisfactory clinical outcome.





METAL COPINGS WITH BALL ATTACHMENTS



ATTACHMENTS CEMENTATION INTRAORALLY



JR AND TRY IN



ACRYLIZED DENTURE



## **Discussion:**

Losing all natural teeth can be a distressing experience for patients, often affecting their confidence as it symbolizes increased dependence on others and aging. In such scenarios, an overdenture serves as a valuable preventive prosthodontic treatment option and should be routinely

incorporated into dental practices due to its numerous benefits. Crum and Rooney [1], in a five-year study, illustrated using cephalometric radiographs that the average vertical bone loss in the anterior mandible of overdenture patients was 0.6 mm, compared to 5.2 mm in patients with complete dentures.

Overdentures minimize bone shrinkage, reduce pressure on the alveolar ridge, and preserve proprioception [9]. They offer advantages such as directional sensitivity, dimensional discrimination. canine response, and tactile feedback [4]. Research shows that denture wearers experience a sensitivity threshold to load that is 10 times greater than that of individuals with natural dentition [5, 6]. A study conducted by Rissin et al. in 1978 compared the chewing efficiency of patients with natural teeth, complete dentures, and overdentures, finding that overdenture wearers exhibited a masticatory efficiency one-third higher than complete denture users [7].

Attachments for overdentures can help redirect occlusal forces, either away from weaker abutments to the soft tissue or toward stronger abutments, resulting in improved retention [8, 9]. These attachments are classified as studs, which connect the prosthesis to individual teeth, or bars, which link the prosthesis to splinted abutment teeth. Additionally, attachments can be rigid or resilient. Since edentulous ridges and remaining roots are often compromised, prostheses with resilient attachments are better suited to distribute occlusal forces effectively, reducing stress on weaker abutment teeth.

### Conclusion

While this technique involves additional costs and requires more appointments, tooth-supported overdentures offer a significantly better prognosis compared to conventional complete dentures. Removable overdentures equipped with extra-radicular attachments enhance retention, stability, support, occlusal balance, and proprioception. These benefits contribute to improved chewing efficiency and phonetics. Furthermore, they help slow

the resorption of the residual ridge by transforming compressive forces into tensile forces, thereby optimizing stress distribution. Although implant-supported overdentures have gained popularity, toothor root-supported overdentures remain a highly effective and reliable treatment option.

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