

CASE REPORT

Tooth-Supported overdenture retained with bareroot, coping and magnetic attachment

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ABSTRACT

Keywords: Bareroot, Copping, Magnetic attachment, Overdenture

Overdenture is removable denture used to replace missing teeth and cover or rest on one or more remaining natural teeth in the mouth. Types of overdentures are non-copping abutment, abutment with coping (long, medium, short) and abutment with Attachment. Abutment with attachment overdenture can provide good retention and stabilization. The purpose of the case study is the assessment of retention improvement of overdenture dentures with coping and magnetic abutments in complete denture in the upper jaw and bareroot in complete denture in the lower jaw. A 59-year-old woman reported having the chief complaint of difficulty in chewing food and speaking due to missing teeth in the upper and lower arch. Intraoral examination revealed the remaining teeth were 17, 23, 24, 43, and had been extruded. Tooth 23 was done to support magnetic overdenture, tooth 24 supported coping overdenture in the full maxillary denture and 43 supported bareroot overdenture in the full mandibular denture. Magnetic and coping retained overdenture enhance the retention in the full maxillary denture and bareroot improves the stability of the mandibular complete denture. (IJPD 2025;6(1):31-34)

Introduction

Tooth-supported overdentures constitute an important concept in preventive prosthodontics. 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 also known as overlay prosthesis, overlay denture, and superimposed prosthesis. In tooth-supported overdentures, the teeth are maintained as part of the residual ridge as it provides psychological benefit to the patients.¹ Alveolar bone resorbs at a faster rate without the support of natural dentition.²

The presence of some remaining natural teeth serves as a constant stimulus to the alveolar bone and thus minimizes bone resorption. There is better retention and stability when compared to the conventional complete dentures and also eliminate the need for implant supported overdentures which have more of financial, anatomical and medical constraints and can also be time consuming. Tooth supported overdenture can reduced stress to the oral mucosa, maintenance of proprioception, bone preservation, increased of masticatory efficiency and reduced of psychological distress due to complete edentulism.³

Overdenture is indicated in patients with few remaining retainable teeth that are periodontally healthy or with potentially reversible periodontal disease, patients with malrelated ridge cases, patients with oral conditions such as xerostomia, patients who need a single denture; patients with unfavorable tongue position, muscle attachments, and high palate make it difficult to stabilize and maintain dentures.^{4,5} Overdentures are contraindicated in patients with questionable oral prophylaxis, systemic complications,

inadequate inter-arch distance,⁵ inadequate attached gingiva and patients who cannot be motivated to develop the desired level of oral hygiene.⁶

Overdentures can be classified based on the preparation of the abutment teeth: non-copping abutment, abutment with coping – long, medium, short, and abutment with Attachment. Non-copping abutments are also called bare root overdentures. The advantages are that they are low cost, can be retreated or modified if necessary, and make it easier for the operator to make a treatment plan. In abutment with coping overdenture, a dome-shaped coping is made from metal and cemented to the abutment tooth. The choice of abutment with coping is that the abutment tooth has healthy periodontal tissue, does not have mobility of more than 1 mm, and has good bone support. Abutment with attachment overdenture can provide good retention and stabilization. One type of attachment is a magnetic overdenture.⁷

The magnetic attachment includes the magnetic assembly and the keeper. The magnetic part is the main part of the magnetic attachment and includes the magnet and its coating. The keeper is a metal part molded onto the root cap and attracted by a magnetic assembly. It should be noted that magnets increase the retention of partial or complete dentures and overdentures, regardless of the route of insertion. Magnets are easy to use alone or together with any type of retainer.⁸ The case study aims to examine the increase in retention and stability of overdenture dentures with coping and magnetic

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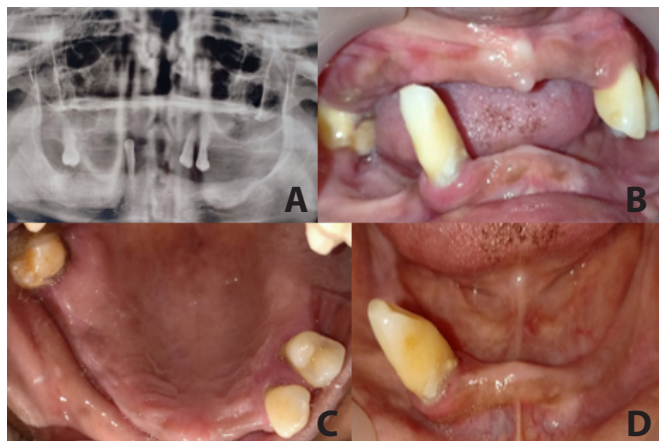


Figure 1. A. Panoramic radiograph, B-D. Intraoral condition

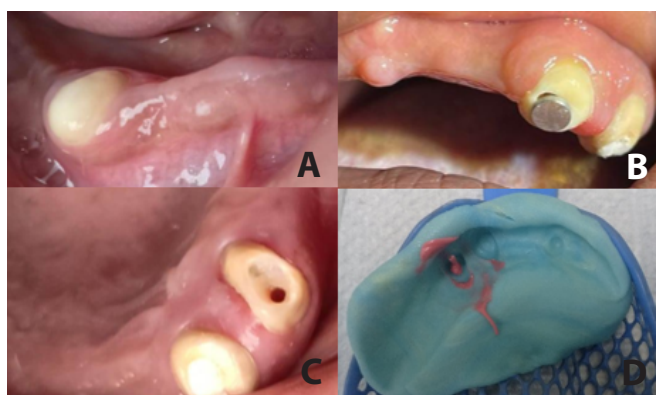


Figure 2. A. Bareroot preparation, B. Try-in keeper, C. Coping and postspace preparation, D. Coping and canal impression

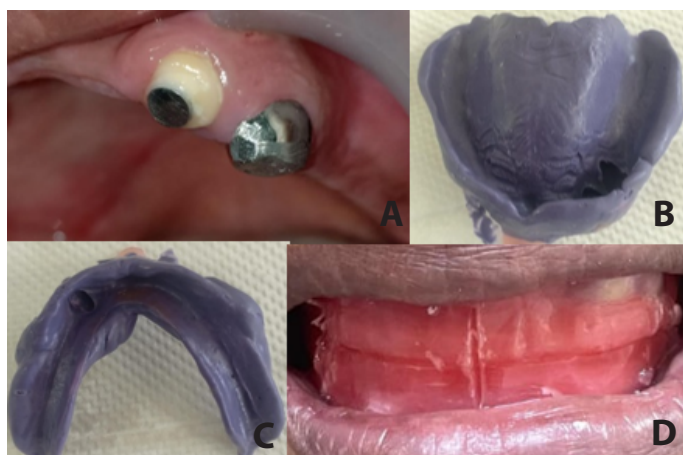


Figure 3. A. Cementation of coping and keeper, B, C. Final impression, D. Recording Maxilla Mandibular Relationship (MMR) and centric relation

abutments in the upper jaw and bareroots in complete dentures in the lower jaw.

Case Report

A 59-year-old woman came to the Prosthodontics Department of RSGM UGM Prof. Soedomo wanted to have dentures because she had difficulty chewing food and speaking due to missing teeth in the upper and lower arch. The patient had no history of systemic disease and allergies. Intraoral examination revealed the loss of several teeth in the upper jaw and lower jaw [figure 1](#). The remaining teeth (17, 23, 24, 43) have been extruded and mobility was found in the remaining right lower canine. There was calculus, gingival recession, and pocket formation along in the remaining teeth. The radiographs revealed general bone resorption in the upper and lower jaw. The patient was planned to construct a tooth-supported maxillary and mandibular overdenture. The patient agreed to get the treatment. The classical treatment plan consists of Phase I: oral health education, scaling and root planing, and extraction of 17 due to over-extrusion. Phase II: intentional root canal treatment (RCT). Phase III: fabrication of teeth supported Complete overdenture in the maxillary and mandibular arch. Phase IV: Follow-up and post-insertion care.

Procedure: At the first meeting, make an impression of maxilla and mandibula to make a study model (to design the denture) and match the tooth color with a shade guide. Next step, after the intentional root canal treatment of all their teeth, they were prepared with tapered round end diamond bur with a chamfer finish line. 43 were prepared to bareroot and restored with Glass Ionomer Cement (GIC) like a dome shape [figure 2A](#). 23 was prepared and the gutta-percha was removed using a Peeso reamer according to the length of the keeper and then tried-in [figure 2B](#). 24 were prepared and leaving $\pm 2-3$ mm height from gingival margin and gutta-percha was removed to facilitate the placement of coping within the canal space [figure 2C](#). Then postspace impression was obtained using gutta percha and light body and upper pickup impression was obtained using putty and light body [figure 2D](#).

Metal coping was fabricated and evaluated for the fit and was inserted into the canal to evaluate the fit and its parallelism. After the trial fit, coping and keeper were cemented in the prepared root canal space with GIC [figure 3A](#). The primary impressions were obtained with irreversible hydrocolloid material and custom trays were fabricated using auto-polymerizing resin. Final impressions for the maxillary and mandibular arches were made with monophase impression material [figure 3B](#) and [figure 3C](#). Master casts were prepared by pouring the impressions in Type III dental stone (to make the overdenture baseplate). The overdenture base plates were retentive and stable when tried-in and the bite rim was made by wax on base plates. Trying in the bite rims to the patient and recording Maxilla Mandibular Relationship (MMR) and centric relations. Creating the median line, the canine lines, and the laugh line [figure 3D](#). Doing fixation of both bite rims then taking out the bite rims from



Figure 4. A. Arrangement of teeth, B. Tissue surface of maxillary denture with magnet, C. Insertion



Figure 5. A. Pre-operative view, B. Post-operative view

the patient's mouth and transferring to the articulator. Arranging the anterior teeth and the posterior teeth in the articulator [figure 4A](#) and then trying into the patient. Retention, stabilization, occlusion, phonetics, and aesthetics were appropriate and good after trying into the patient. The next step was processing the denture in the laboratory. Subjective and objective examinations must be done after a magnet is installed on the baseplate maxillary arch using auto-polymerizing resin and overdenture insertion [figure 4B](#) and [figure 4C](#). The patient was satisfied with the treatment outcome [figure 5A](#) and [figure 5B](#). Instructions post-insertion to the patient regarding denture maintenance and oral hygiene were given to the patient, and follow-up was arranged every three months. The patient had no complaints on the control day.

Discussion

Various studies have reported that there is a continuous resorption of the residual alveolar ridge in completely edentulous patients with complete dentures and this continuous resorption may lead to serious prosthodontic problems and difficulties both for the patient and the dentist.⁹ Preserving the remaining natural teeth has an excellent effect on the retention and stability of dentures. Tooth-supported overdenture accomplishes three important goals. It maintains the abutment as a part of the residual ridge, providing more support than a conventional complete denture. When teeth are retained, the integrity of the alveolar bone is maintained because they support the alveolar bone. With the preservation of the teeth, there is also preservation of the periodontal membrane.¹⁰

In the following case, for mandibular using complete overdenture with bare root on 43. The bareroot abutment usually prepared to correct the crown-root ratio is compromised.¹¹ The root canal orifices are restored with an glass ionomer cement. It is recommended to restore the root canal orifice under dental dam isolation before reducing the crown height to the gingival level, which can avoid abutment isolation problems and increase the success rate of restoration and endodontic treatment.⁴ Bareroot is expected can improve support and denture stability, increase the abutment teeth life expectancies, and inhibit resorption of the residual ridge of the mandible. For maxillary using a complete denture with magnet attachment on 23 and the short metal coping on 24.

Overdenture with magnetic retention has the advantage of being able to increase retention, overcoming the lateral forces of the abutment tooth, and easy application. Magnets are small in size but have great attraction and are placed on the bottom of the denture so that do not disturb the aesthetics, especially when it comes to anterior teeth.¹² That ninety-seven percent of patients were satisfied with the retention and stability of their overdenture with magnetic attachments after 5-years follow-up and no corrosion of magnet was observed during this period.¹³ A systematic review and meta-analysis study reported that the survival rate of magnetic attachment was approximately 90%-92% after 3-years follow-up period.¹⁴

The short coping design showed the least amount of stress than any of the other designs. This design minimizes horizontal torque on the roots and provides easy maintenance of oral hygiene.¹⁵ The use of copings on relatively porous dentin surfaces can protect abutment teeth from the penetration of

microorganisms.¹⁶ A case series reported that all roots and copings remained in good condition, there were no reports of fractures of the denture base, loss of retention and stability and the patient was reported to be very satisfied with the treatment after 5-years follow-up. The use of short-copings reduces the risk of denture base fracture and the stress distribution to the remaining teeth is lower, especially with non-axial forces.¹⁷

Overdenture has advantages including preservation of residual ridge, maintenance of proprioception, improved retention and stability of dentures, it can be easily converted to a conventional complete denture by relining if abutment fails and psychological gain of not having lost all the natural teeth.¹⁸ The patients restored with tooth supported overdenture showed higher masticatory efficiency than those restored with conventional complete dentures.¹⁹ Disadvantages of overdenture include the need for increased oral hygiene to prevent caries and periodontitis. Dentures tend to be overly contoured to the position of natural teeth, increasing the risk of fractures if the thickness of the acrylic layer is insufficient and the appropriate amount of tooth grinding is not performed.²⁰

Overdenture is an outstanding treatment modality as compared to conventional dentures. The success of the overdenture treatment depends on proper patient selection and motivation, basic prosthodontic principles, maintenance of oral hygiene, appropriate homecare, recall visits and radiographic examinations at regular intervals.²¹ Brushing techniques, using fluoride toothpaste, and massaging the gum tissues were taught to patients for successful long-term overdenture treatment.²²

Conclusion

Overdentures have proven many advantages and applications compared to conventional complete dentures. It is one of the best and most comfortable treatment alternatives for edentulous patients with few remaining teeth. Abutment with metal coping and magnet attachment can provide good retention, stability, support, and masticatory efficiency for the patient. While bareroot can improve support and denture stability of the mandibular complete denture. Regular follow-up is essential for the longevity of the prosthesis and for the preservation of the health of the remaining teeth.

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