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CASE REPORT

Tooth-supported overdenture retained with metal medium copings: A case report

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ABSTRACT

Overdenture is removable denture used to replace missing teeth and cover or rest on one or more remaining natural teeth in the mouth. The concept of overdenture is a positive means for delaying the process of complete edentulism and helps in reducing bone resorption. Selection of teeth to be retained by looking at periodontal tissue and history of dental caries. Tooth-supported overdenture using coping can be made with short coping, medium coping, or long coping. Metal copings can be used on teeth that have decreased alveolar bone support but are still strong, also covering dentin tubules. On this report, A 62-year-old man patient reported having the chief complaint of difficulty in chewing food and speaking due to missing teeth in the upper and lower arch. This case report describes prosthodontic rehabilitation of a mandibular partially edentulous arch with tooth-supported overdenture using metal medium copings which aim to provide sensory response with further stability and retention to the denture. The patient was satisfied with the treatment outcome. For elderly edentulous patient with few remaining teeth, a tooth-supported overdenture is one of the best and most practical, feasible, and comfortable treatment alternatives. (IJP 2024;5(2):138-140)

Introduction

Overdenture is removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants. Residual ridge resorption is a continuous process and the resorption is even at a faster rate without the natural tooth support. Tooth-supported overdentures are considered as a part of preventive prosthodontics. Restored retained abutments teeth are frequently endodontically prepared and used as abutments for an overdenture. The objective is to distribute stress concentration through retained abutments and denture-supporting soft tissues. Tooth-supported overdenture using coping can be made with short coping, medium coping, or long coping. Metal copings can be used on teeth that have decreased alveolar bone support but are still strong, also covering dentin tubules. Patients with natural dentition, complete denture and overdenture were compared based on masticatory performance, then the result was the overdenture patients had a chewing efficiency one-third higher than the complete denture patients.[1] A timely planned tooth-supported overdenture has been a proven mainstay of preventive prosthodontics therapy as it attempts to conserve the few remaining natural teeth/roots and reducing alveolar bone resorption. There are advantages of the tooth-supported overdenture such as gives secured prosthesis support, economical, good proprioceptive response, and improves the retention and stability of the dentures. Tooth-supported overdenture is favourable as they provide psychological, biological, and functional advantages to the patient.[2] This case report describes prosthodontic rehabilitation of a mandibular partially edentulous arch with tooth-supported overdenture using metal medium copings which aim to provide sensory response with further stability and retention to the denture.

Case Report

A 62-year-old man came to the Prosthodontics Department of RSGM Prof. Soedomo wanted to have dentures because he had difficulty in chewing food and speaking due to missing teeth in the upper and lower arch. Intra oral examination revealed the loss of several teeth in the upper jaw (17, 16, 15, 14, 13, 12, 22, 23, 24, 25, 26, 27) and also in the lower jaw (37, 36, 35, 34, 32, 31, 41, 45, 46, 47) figure 1A - figure 1D. 11 have been installed short metal coping and 21, 33, 42, 43, 44 had already got the root canal treatment. The patient had been to the dentist last month for tooth extraction, also scaling and root planning. The patient had previously used a maxillary overdenture. The patient had no history of systemic disease. The patient had no history of allergies. The patient was not under the care of a doctor or taking regular medication. The patient was managed with maxillary tooth-supported complete overdenture (short metal coping on 11 and bareroot on 21) and mandibular tooth-supported complete overdenture (medium metal coping on 33, 43 and bareroot on 42, 44). The

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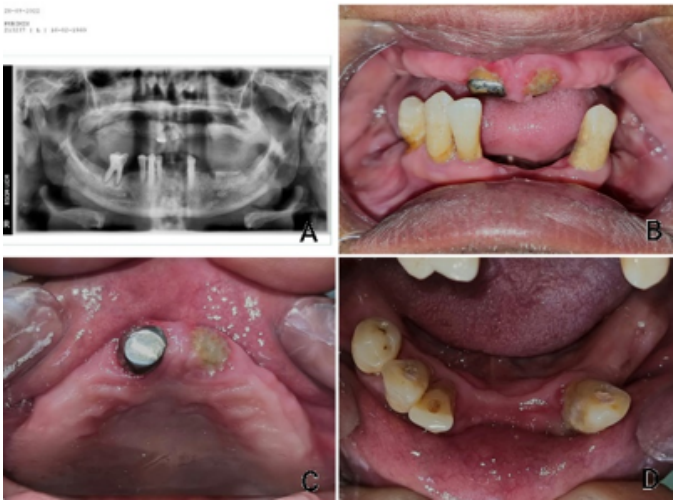

Figure 1. A Panoramic radiograph; B, C, D intra oral condition

Figure 2. Pre-treatment frontal view

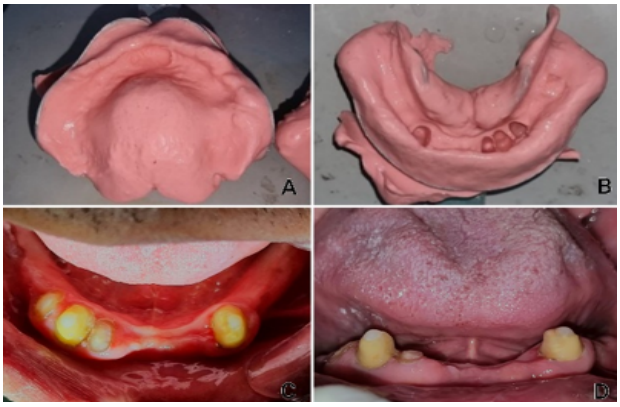

Figure 3. A, B The impressions of maxilla and mandibula to fabricate study model; C, D Preparation of 33, 42, 43, and 44

patient was agreed to get the treatment figure 2.

At the first meeting, making impression of maxilla and mandibula figure 3A and figure 3B to fabricate study model (to design the denture and also to make the individual tray) and matched tooth colour with shade guide. Next step was teeth preparation figure 3C and figure 3D. 42 and 44 were prepared equivalent to the gingival margin. 33 and 43 were prepared and leaving 3 mm height from gingival margin. Applied Glass Ionomer Cement (GIC) to cover the surface of all prepared teeth. Making impression of mandibula to fabricate work model (to make the metal medium copings). All copings were fit after trying in. All metal medium copings were cemented with GIC figure 4A and figure 4B.

Individual tray had no problem after trying in. Making impression of maxilla and mandibula with individual tray figure 4C and figure 4D to fabricate work model (to make the overdenture baseplate). The overdenture base plates were retentive and stabile when it tried in. The base plates were not dropped off when trying in and also when using to talk or other mouth movement. Bite rim was made by wax on base plates. Trying in the bite rims to the patient and recording Maxillo Mandibular Relationship (MMR) figure 5A. Measuring vertical dimensions and determining centric relations. Creating the median line (by drawing a line from the philtrum to determine the median line), the canine lines (this line will determine the mesiodistal width of the anterior teeth), and the laugh line (made at 2/3 of the length of the maxillary incisors) figure 5A. Doing fixation both bite rims then taking out the bite rims from patient mouth. Bite rims were transferred to the articulator. Arranging the anterior teeth in articulator figure 5B then trying in to the patient. Overjet, overbite, median line, canine lines, laugh line, and phonetics had been appropriate and good after trying in to the patient. Continuing arranging the posterior teeth figure 5C then trying in to the patient. Retention, stabilization, occlusion, phonetics, and aesthetics were appropriate and good after trying in to the patient. Next step was processing the denture in laboratory. Subjective and objective examinations must be done after doing overdenture insertion. Patient had no complaint after overdenture insertion figure 5D. Patient said there was no problem in retention, stabilization, occlusion, phonetic, and aesthetic when using the denture. The patient was satisfied with the treatment outcome. Instructions to the patient: patient was taught how to wear and remove the dentures, maintaining denture cleanliness, removing dentures at bedtime and soaking them in clean water in a closed container, immediately contacting the dentist if there were complaints or pain, and doing control on the scheduled time. Patient had no complaint on the control day figure 6.

Discussion

Edentulism is considered a major public health problem worldwide, despite the advancement in preventive dentistry. Various studies have reported that there is a continuous resorption of the residual alveolar ridge in completely edentulous patient with complete denture and this continuous resorption may lead to serious prosthodontic problem and difficulties both for the patient and the dentist.[2] Preserving the remaining natural teeth have an excellent effect on retention and stability of dentures. It also gives the patient a great

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Figure 4. **A, B Metal medium coping cementation; C, D The impressions to fabricate work model**

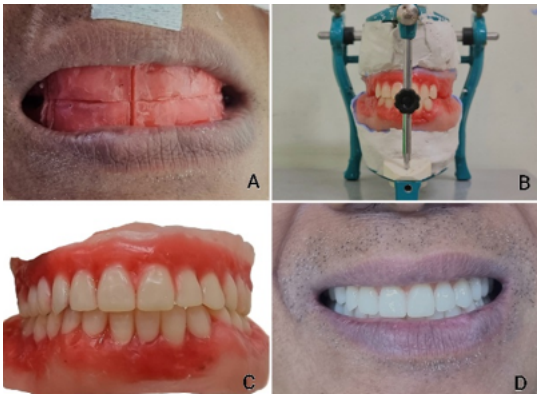

Figure 5. **A. Trying in the bite rims and recording Maxillo Mandibular Relationship (MMR), B. Arranging the anterior teeth, C. Arranging the posterior teeth, D. Insertion**

Figure 6. **Frontal view on control day**

psychological satisfaction. Tooth-supported overdenture accomplishes three important goals. It maintains the abutment as a part of the residual ridge which in turn provides more support than a conventional complete denture. When the teeth are retained, alveolar bone integrity is maintained as they support the alveolar bone. With the preservation of the teeth there is also preservation of the periodontal membrane.[3] Root canal therapy is a necessary phase of preparation for the selected teeth.[4] In the following case report, we have used metal medium copings which are comparatively economical solutions as the interarch space were limited. Abutments were prepared in dome shape contour and received cast copings. These dentures provide mainly the preservation of alveolar bone, maintenance of proprioception and stability of prosthesis. Oral hygiene instructions must be given to the patient and reinforcement of the same has to be done. Recall examinations with radiographs at regular intervals of 6 months or less will maintain the prosthetic, restorative, and periodontal status of the patient at acceptable levels, which in turn leads to the success of the overdenture therapy. Regular fluoride gel application can also be advised for proper maintenance of abutment tooth.[5]

Conclusion and Suggestion

Overdenture has proven innumerable advantages and applications compared with conventional complete denture. Overdenture are a good and economic treatment option for patients who have healthy abutment teeth. Tooth-supported overdenture with metal medium coping is a simple and cost-effective alternative treatment. Use of overdentures has been favoured often because of mechanical advantages. The retained tooth provides dentures with good stability and support with slow rate of alveolar resorption. For edentulous patients with few remaining teeth, a mandibular tooth-supported overdenture is one of the best and most comfortable treatment alternatives. Patient education determine the treatment results and the patient's post prosthetic quality of life.

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