



Received: 07-06-2023
Accepted: 17-07-2023

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Mandibular Tooth-Supported Overdenture: A Case Report

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Abstract

Overdenture is one of the most preferred treatment modality in elderly individuals with very few remaining natural teeth. Retaining the natural teeth preserves the proprioceptive impulses, reduces the residual ridge resorption and improves the retention of the denture. This case report describes the

fabrication of a mandibular tooth supported overdenture. A tooth-supported overdenture retaining two mandibular premolars with short copings were found to be successful in rehabilitating a partially edentulous patient with excellent retention and additional stability to the prosthesis.

Keywords: Tooth Supported, Overdenture, Short Coping, Partially Edentulous

Introduction

An overdenture prosthesis is a removable complete denture that is retained by a natural teeth, tooth roots, or dental implants^[1]. This treatment modality has proved to be effective in rehabilitating patients with very few remaining natural teeth. Retaining the natural teeth will preserve the proprioceptive impulses so that an integral part of myofacial nervous complex is not lost^[3]. thus giving the patient the sensitive ability to be aware of the occlusal contacts. The residual ridge resorption is also found to be significantly reduced when the natural teeth are retained thereby improving the stability of the denture^[4]. Moreover the use of copings and other attachments improves the retention of the denture^[4]. There are varieties of overdenture attachments that are available in the market. Attachments may or may not always be used, because of its cost and associated complications. Implant retained overdenture is also an alternative option but may not always be possible due to severe residual ridge resorption or economic reasons^[5].

Case Report

A 70 years old male patient reported to Department of Prosthodontics, Srinivas institute of dental sciences, Mangalore, with the chief complaint of missing teeth and difficulty in chewing. There was no relevant medical history. Patient gave history of multiple extractions done in the maxillary and mandibular arch gradually over the past 10 years. Intraoral examination revealed that the patient had a partially edentulous maxillary and mandibular arch. The teeth present in the maxillary arch were 11,12,13,15, 22 and in the mandibular arch were 34, 35 (Fig 1). All remaining natural teeth were vital and there was mild gingival inflammation. The different treatment options given to the patient were a removable partial denture with respect to the maxillary arch and a conventional complete denture to the mandibular arch or a tooth supported overdenture or an implant supported overdenture with respect to the mandibular arch and a removable partial denture with respect to the maxillary arch. The conventional complete denture option for mandibular arch was ruled out as the patient was not willing to extract the remaining natural teeth. The implant supported prosthesis option was rejected by the patient because of the need for additional surgery, the prolonged duration of treatment phase and related cost of the treatment. It was then planned to fabricate a maxillary partial denture and a mandibular tooth-supported overdenture with short copings.



Fig 1: Intraoral frontal view showing the remaining natural teeth

A diagnostic casts was made to determine the vertical dimension of occlusion and to assess the available inter-arch space. The inter-arch space was found to be adequate. Root canal treatment was advised for the proposed abutment teeth, 34 and 35 to receive a short coping. After root canal treatment, tooth preparation was done for the proposed abutment teeth (Fig 2). The abutments were reduced to a coronal height of 3 mm and then contoured to a dome shaped surface. After preparation the impression was made using polyvinyl siloxane impression material and cast was poured (Fig 3).



Fig 2: Abutment teeth preparation



Fig 3: Master cast

The wax patterns for copings were fabricated and were casted. The obtained copings were cemented to the respective abutments using resin-modified GIC (Fig 4) and assessed using a radiograph (Fig 5).



Fig 4: Cementation of short copings



Fig 5: Radiographic assessment of copings

Maxillary and mandibular impressions were made with cemented copings in position using polyvinyl siloxane impression material and cast poured using Type III Gypsum (Fig 6). Undercuts were blocked out using modelling wax, denture bases were fabricated and occlusal rim were made (Fig 7).

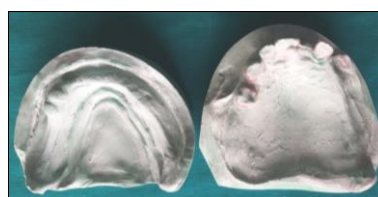


Fig 6: Master cast was made



Fig 7: Denture base and occlusal rims were fabricated

The maxillomandibular relation was recorded and maxillary and mandibular casts were mounted on articulator (Fig 8). The teeth arrangement was completed and try-in was done in the patient.



Fig 8: Mounting of casts in the articulator

After try-in the dentures were waxed-up, carved and then processed. The final prosthesis were finished and polished (Fig 9A and B).

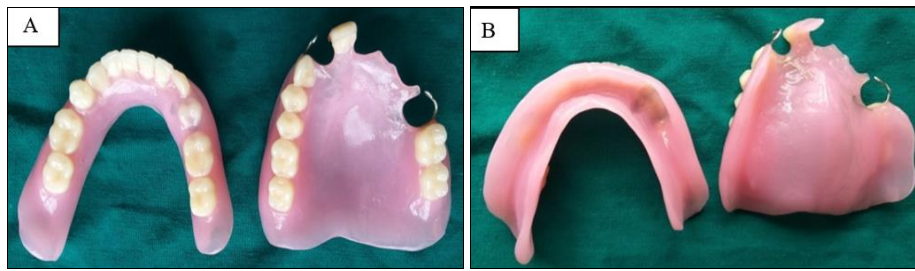


Fig 9A and B: Final prosthesis

The denture insertion was done (Fig 10A, B and C) and patient was recalled at subsequent intervals of one week, three months, six months and one year. After one year

follow-up, the copings were intact with good marginal integrity. Oral hygiene and the dentures were well maintained by the patient.



Fig 10A, B and C: Post insertion

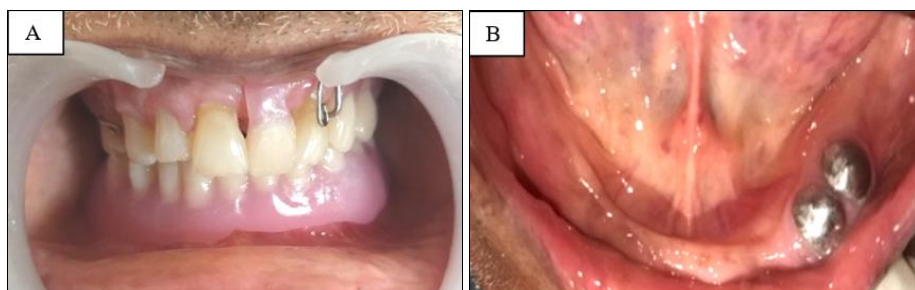


Fig 11A and B: One year follow-up

Discussion

The success of an overdenture primarily depends on the type of overdenture selected and planned for a particular patient. Various techniques are advocated for fabrication of overdentures, namely tooth reduction with or without

endodontic therapy, followed by cast copings with or without any of the attachments [6]. The decision for using an attachment is made for patients with significant amount of bone loss and when there is need for enhancing the retention [6].

In this case tooth-supported overdentures with short copings were planned for the patient after the root canal treatment of the respective teeth was done. Warren *et al* in their study concluded that the short coping design exhibited the least amount of stress than any of the other designs, as the load was primarily transmitted along the long axis of the abutment teeth^[7]. Thus, short copings were planned since it provided good retention with least amount of stress being transferred to the abutment teeth. A short coping requires teeth preparation of about 2mm-3mm which demands endodontic treatment prior to the prosthetic rehabilitation. Even though the abutment teeth were present unilaterally in this case, it provided excellent retention with short copings, hence the need for additional attachments were not required. Since no additional attachments were planned, complications associated with attachments including fractures and the need for frequent replacement of the attachments were eliminated and also maintaining the oral hygiene was easier for the patient. One year follow-up revealed good retention with intact copings and well-maintained oral hygiene suggesting a successful outcome of the prosthetic rehabilitation.

Conclusion

Tooth-supported overdentures with short copings are a simple and cost-effective alternative treatment option for partially edentulous patients, with few remaining natural teeth. A well-planned multidisciplinary approach and patient education is the primary determinant of the success if the treatment outcome.

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