

Rehabilitation Of An Edentulous Patient With Tooth Supported Overdenture – A Case Report

Abstract

Overdenture has been a proven mainstay of conservative prosthodontic treatment when proper diagnosis, treatment planning, and most importantly, patient compliance are achieved. Despite recent developments in dental implantology, the conservative approach to root preservation followed by an overdenture is still valid. The many advantages of root retention include- alveolar bone maintenance, better prosthesis support, proprioceptive feedback, aesthetics and psychological benefits. This paper presents a case report of rehabilitation of an edentulous patient with a tooth supported overdenture.

Key Words

Edentulous, Rehabilitation, Coping, Tooth supported overdenture

Introduction

Overdenture is a complete or removable partial denture that covers and rests on one or more remaining natural teeth, the root of natural teeth, or dental implants. Overdentures offer many advantages over conventional complete dentures. The most important benefits are preservation of the remaining alveolar supporting bone along with increased stability and retention of the prosthesis. Retaining natural teeth under an overdenture preserve sensory input from the periodontal receptors which are more precise than that obtained from oral mucosa. Periodontal receptors also play an important role in the masticatory-salivary reflex by regulating the range and type of the masticatory stroke.

Thus, overdentures are more beneficial as they provide psychological, functional as well as biological advantages for the patients.

Case Report

This article presents two case reports in which overdenture applications were planned. Both the patients visited Department of Prosthodontics and Crown & Bridge, Himachal Dental College Sundernagar, Himachal Pradesh.

Case 1

A fifty four years old male patient presented with the chief complaint of difficulty in chewing food due to missing teeth. There was no relevant medical history affecting prosthodontic treatment.

Extra oral examination showed no gross abnormality. Intraoral examination revealed well formed maxillary edentulous ridge. In mandibular arch, 33, 42, 43 & 44 teeth were present. Maxillary and mandibular ridges were in class I ridge relationship (Fig 1). Grade three mobility was present in 42. Therefore it was advised to extract 42 as a part of the treatment.

The different treatment options available for this patient were -

1. Extraction of remaining teeth followed by conventional complete denture in both maxillary and mandibular arches.
2. Total extraction followed by implant



Fig 1 : Pre-operative Intraoral View

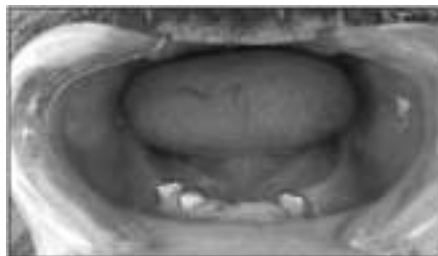


Fig 2 : Metal Copings Cemented Over Prepared Teeth

- ¹ Manoj Rawat
- ² Archana Nagpal
- ³ Ramit Verma
- ⁴ Jasjit Kaur
- ⁵ Himanshu Kapoor

¹ Private Practitioner

² Professor and Head

³ Senior Lecturer

⁴ Senior Lecturer

⁵ Senior Lecturer

Dept. Of Prosthodontics

Himachal Dental College, Sundernagar

Address For Correspondence:

Dr. Manoj Rawat

Rawat Niwas, Saraswati Nagar, Post Office Hartkoti

Tehsil Jubbal, Distt Shimla, Himachal Pradesh

Submission : 14th January 2013

Accepted : 23rd November 2013

Quick Response Code



supported overdenture in both the arches.

3. Tooth supported overdenture in mandibular arch opposing complete denture in maxillary arch.

It was decided to use the remaining teeth as abutments and fabricate an overdenture. The location of the remaining teeth was favourable for an overdenture. The patient was motivated to retain the remaining teeth in the mandibular arch. Due to economical reasons, complete denture was planned in maxillary arch.

The remaining teeth were endodontically treated. The abutment teeth were reduced in vertical height to 2mm above the crest of the ridge. The preparation was rounded to minimize the horizontal torque on the roots. The tooth preparation was done to receive copings. Impression of the prepared teeth was made to obtain a cast. Wax pattern was made over the prepared teeth. Metal copings were obtained by casting and cemented over the prepared teeth (Fig. 2). Final impression, with coping in place on their respective abutment was made using a



Fig 3 : Impression Surface Of The Denture



Fig 4 : Overdenture Over Restored Abutments



Fig 5 : Pre-operative



Fig 6 : Post-operative

accommodate the abutments (Fig. 3). The dentures were finished, polished and inserted into the patient mouth (Fig 4). The patient was given instruction about insertion and removal as well as maintenance of the dentures.(Fig 5) The post operative appearance is shown in (Fig 6). Periodic follow-up was carried out.

Case 2

A 46 years old male patient presented himself with the chief complaint of difficulty in chewing food. He wanted to get his missing teeth replaced. There was no relevant medical history to affect the course of prosthodontic treatment. Extra oral examination showed repaired cleft lip. Intraoral examination revealed a repaired defect in hard and soft tissue involving the premaxilla. This defect was present due to repaired cleft lip and palate at the age of fifteen years. In the maxillary arch 13, 24 were the only remaining teeth. In the mandibular arch 31,32,33,34,35,37,41,42,43,44&45 teeth were present (Fig 1). Maxillary and mandibular ridges were in class I ridge relationship.

The different treatment options available for this patient were –

1. Extraction of remaining teeth in the maxillary arch followed by conventional complete denture in the maxillary arch and removable partial denture in mandibular arch.
2. Tooth supported overdenture in the maxillary arch and removable partial

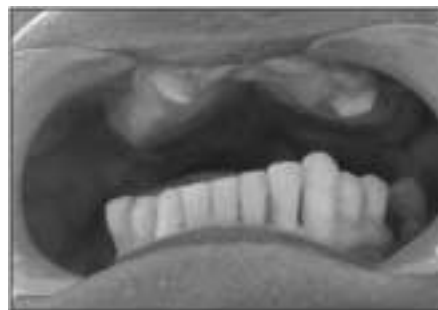


Fig 1 : Pre-operative Intraoral View



Fig 2 : Metal Copings Cemented Over Prepared Teeth

denture in the mandibular arch.

It was planned to retain the remaining teeth in the maxillary arch and use them as overdenture abutments. The location of the remaining teeth was favourable for the overdenture abutments. The patient was motivated for the treatment.

The remaining maxillary teeth were endodontically treated. Endodontically treated teeth were prepared to receive copings. Impression of the prepared teeth was made to obtain a cast. Wax pattern was made over prepared teeth. Metal copings were obtained by casting the wax pattern. Coping was finished polished and cemented over the abutments (Fig 2). Final impression was taken with copings in place on their respective abutments using a custom tray. The jaw relation was recorded. Teeth arrangement was made and try-in was done. Complete denture was fabricated in the maxillary arch following the conventional method except that the recess were created on the

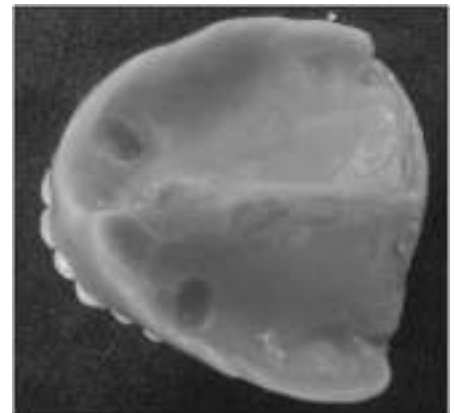


Fig 3 : Impression Surface Of The Denture



Fig 4 : Overdenture Over Restored Abutments



Fig 5 : Pre-Operative

custom tray. The jaw relation was recorded. Teeth arrangement was made and try-in was done.

Maxillary and mandibular complete dentures were fabricated following the conventional method except that the recess was created on the impression surface of the mandibular denture to



Fig 6 : Post-Operative

impression surface of the denture to accommodate the abutments (Fig 3). The dentures were finished, polished and inserted in the patient mouth. Patient was given instruction about insertion and removal as well as maintenance of the dentures (Fig 4), (Fig 5). The post operative appearance is shown in (Fig 6). Periodic follow-up was carried out.

Discussion

Fabrication of tooth supported over denture is a step in the direction of preventive prosthodontics^[1]. The residual ridge reduction coupled with reduced dexterity at advanced age impairs the adaptation to denture prosthesis. The obvious way to prevent denture problems is to save the natural teeth.^[2] Healthy teeth with compromised periodontal status can be modified and retained for biomechanical and psychological advantages. This preventive approach can be achieved by means of overdentures.^[3]

Two most significant factors for the success of the overdenture are proper selection of the patient and establishing careful mode of treatment that will satisfy both the patient and the dentist.^[4] Simple approach to the problem i.e. patients with congenital defects such as cleft palate, partial anodontia, microdontia, amelogenesis imperfecta etc is available in the form of overdentures which will be relatively fast and inexpensive mode of treatment.^[5] According to Zarb et al the advantages of overdentures include retention and stability especially the mandibular dentures^[5]. The maxillary overdenture is of great value when it opposes remaining mandibular anterior teeth, because it aids in conserving the ridge against resorption from masticatory stress.^[1]

Root canal therapy is a necessary phase of preparation for the selected teeth;

single rooted or double rooted teeth with readily accessible canals are preferred.^[6] Teeth that are mobile because of bone loss can become acceptable for overdenture support when the clinical crown is reduced to near ridge height.^[6] The short coping design showed least amount of stress than any of the other design like tapered coping design & tapered coping with occlusal bearing design. This design minimizes horizontal torque on the roots^[7] and provides ease of maintenance of oral hygiene.^[11]

Various techniques used in the treatment of teeth to serve as abutment for overdenture ranges from simple tooth modification and reduction, tooth preparation with cast coping to endodontic therapy with amalgam plug or cast coping utilizing some form of attachments.^[8] Attachments like ceka attachment and bischof-dosenbach attachment can be used but economic reasons sometime restrict their use.

The main objective in using tooth-supported overdenture is to preserve the remaining supporting tissue and to restore missing structures in such a way as to provide maximum service for maximum amount of time. A major premise of tooth supported overdenture treatment is to transfer occlusal forces along the long axis of the supporting tooth, to minimise the horizontal torque and to allow for a more optimum situation for periodontal ligaments.^[7]

According to Robert L Defranco 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. However when teeth are removed alveolar bone resorption process begins. With the preservation of the teeth there is also preservation of the periodontal membrane and this in turn preserves proprioceptive impulses resulting in better occlusal awareness, biting forces and consequent neuromuscular control.^[5] In routine clinical practice, overdenture should also be considered as a treatment modality for

a patient who has few teeth left in the oral cavity.

Thus it can be said that the application of overdentures is unlimited and its success depends on the dentist judgement and skill and patient motivation to maintain good oral hygiene.

Summary

Tooth supported overdentures are still an excellent and economic therapeutic concept. In this study use of root abutment as an aid to support complete denture is presented. Use of overdentures has been favoured often because of mechanical advantages. Even though the retained teeth may be periodontally compromised, they still may provide sufficient support for the transmission of masticatory pressure and periodontal ligament receptors to initiate a jaw opening reflex. The abutments enhance support and stability of the denture and slow the rate of alveolar resorption. The clinical procedure is straightforward and can be readily applied in general dental practice.

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Source of Support : Nil, Conflict of Interest : None declared