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Case Report

Tooth-Supported Overdenture: A Case Report

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Abstract

For elderly patients with few remaining teeth, overdenture is one of the successful treatment modality as it decreases residual ridge resorption and also aids in retention and stability of denture. Roots maintained under the denture base preserve the alveolar ridge, provide sensory feedback, and improve the stability of the dentures. The concept of overdentures may not be the elixir, but it helps in delaying process of complete edentulism and also helps in bone preservation. To top it all, it gives the patient the satisfaction of having prosthesis with his natural teeth. The concept of conventional tooth-retained overdentures is a simple and cost-effective treatment than the implant overdentures. In this case report, rehabilitation of an edentulous patient with a tooth-supported overdenture is discussed.

Key words: Overdenture, Prosthesis, Residual Ridge Resorption, Stability

INTRODUCTION

Overdenture is a removable partial or complete denture that covers and rests on one or more remaining natural teeth, roots, and/or dental implants, a dental prosthesis that covers and is partially supported by natural teeth, tooth roots, and/or dental implants (GPT 8).[1] It is also called as overlay denture, overlay prosthesis, and superimposed prosthesis.[2] Tooth retained overdenture option, as preventive prosthodontics treatment modality becomes a boon for edentulous patients due to its innumerable advantages and also due to a simple and cost-effective treatment than the implant overdentures.[3] Overdenture takes advantage of few firm teeth that are present in an otherwise compromised dentition, which can be retained and used as abutments for overdenture fabrication.[4] This helps to improve the retention and stability of the final prosthesis significantly as the bone is a dynamic tissue.[5] The extraction of teeth results in the initiation of the bone resorption pattern. An additional bone formation occurs when bone receives tensile stress. Such stresses occur when occlusal forces are transmitted to the alveolar bone by the periodontal ligament of the preserved teeth, which are used as abutment teeth for overdentures, and prevent residual ridge resorption and this principle helps preserve bone. Hence, we can say the concept of overdenture helps in bone preservation and also delays complete edentulism.

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Indications	Contraindications
Dental arch having four or less than four retainable teeth	Patients who cannot be motivated to develop the desired level of oral hygiene
Loss of teeth in one dental arch while the other is dentulous.	Severe systemic complications as it can make treatment unsatisfactory for the patient.
Those with unfavorable tongue positions, muscle attachments, or residual ridges.	There is inadequate interarch distance.
Patients who may encounter problems with retention and stability of conventional complete dentures.	Inadequate attached gingiva

GENERAL CONSIDERATIONS DURING DIAGNOSIS AND TREATMENT PLANNING

Periodontal Consideration

Periodontal inflammation, pocket formation, and bony defect must be eliminated before starting treatment. An important periodontal requisite with overdenture abutment is an adequate zone of attached gingiva.

Endodontic Consideration

There are advantages of treating the abutment endodontically. Few to mention include:

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1. By endodontic treatment, we can make the crown – root ratio favorable.
2. By tooth preparation, interocclusal clearance is also provided for the arrangement of artificial teeth.
3. For securing attachments.

Location of abutment teeth: Two teeth in each quadrant present an ideal situation, for example,

1. Cuspids, second premolars, or second molars in each quadrant
2. Mandibular cuspids are most often utilized since they are usually the last teeth to be lost
3. Mandibular incisors can be used as overdenture abutments if the mandibular arch is intact.[2]

CASE REPORT

A 72-year-old male patient reported to the Department of Prosthodontics, Teerthanker Mahavir Dental College and Research Centre, Moradabad, with the chief complaint of difficulty in chewing due to missing teeth. The medical history of the patient was taken, and it was irrelevant affecting prosthodontic treatment. Intraoral examination revealed well-formed maxillary and mandibular ridges in Class I ridge relationship. Only teeth that were present 13, 22, 23 in the maxillary arch, and 43 in the mandibular arch and radiographic examination revealed good bone support and long roots.

The different treatment options available for this patient's mandibular arch were – extraction of the remaining teeth followed by conventional complete denture, implant-supported overdenture, and tooth-supported overdenture. The patient denied implant-supported overdenture due to additional surgery and long treatment time as well as high expenditure. It was planned to construct a tooth-supported maxillary and mandibular overdenture. Hence, it was decided to retain 13, 22, 23, and 43, proceed with intentional root canal treatment (RCT) followed by coping with all four teeth.

After the intentional root canal treatment of all four teeth, they were prepared with tapered round end diamond point with a chamfer finish line. Impression was made with additional silicone for the fabrication of copings. The copings obtained were checked for fit in the patient's mouth and finally cemented with glass ionomer cement. The thickness of the copings should not be more than 1 mm [Figure 1].

Primary impressions for the maxillary and mandibular arches were made with alginate. The impressions were poured and special trays were fabricated with self-cure acrylic resin with double spacer over abutment teeth. Border molding was done for both the arches with low fusing compound. Final impressions for the maxillary and mandibular arches were made with light body addition silicones [Figure 2]. Master casts were prepared by pouring the impressions in Type IV gypsum products.

Fabrication of record bases was done after the application of separating medium and copings was covered with wax. Placement of wax over abutments prevents the fracture of abutment during removal and placing of denture bases during different laboratory procedures. Fabrication of occlusal rims was done; jaw relations were recorded and transferred onto the semi-adjustable articulator with the help of face-bow.

Teeth arrangement was done and evaluated in the patient's mouth for phonetics, vertical and centric relation, and esthetics. Verification of vertical dimension and also centric and eccentric contacts was checked [Figure 3]. Patient's approval was taken, and the curing of the final denture was done in Lucitone acrylic resin. The denture was cured and polished. Adjustment of denture bases was done with articulating paper and pressure indicator paste. The patient was satisfied as the denture was very retentive and stable [Figure 4].

Figure 1: Copings cemented after endodontic treatment and tooth preparation

Figure 2: Border molding and final impression with green stick compound and light body addition silicone

Figure 3: Trial with respect to maxillary and mandibular denture bases

Figure 4: Final denture insertion

DISCUSSION

Tooth-supported overdentures help in the preservation of natural teeth and supporting structures. In many instances, teeth that would otherwise be removed can be retained to provide support for complete dentures. Frequently, only even one natural tooth can successfully help support a denture.[6] Rissin *et al.*, in 1978, compared natural dentition, conventional complete denture, and overdenture and it was found that the over-denture patients had a better chewing efficiency and it was about one-third higher than the complete denture patients. Crown and Rooney, in 1975, also found that preservation of alveolar bone occurs when the mandibular canine is retained for overdenture.[2]

CONCLUSION

The success of the tooth-supported overdenture treatment depends on the proper selection for the particular case. Overdenture patients have a chewing efficiency higher than the complete denture patients[7] which suggest that tooth-supported overdenture is very much effective both functionally as well as esthetically; moreover, it does not put heavy burden on patients pocket. Hence, this treatment modality should be considered in our regular clinical practice.[8]

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