

Preservation of alveolar bone and proprioception using overdenture: A case report.

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Abstract

Introduction: Overdenture, is a prosthesis that is designed to sit on top of something, i.e. tooth or implant and are of two types overdentures construction: tooth-supported and implant-supported. Tooth-supported overdentures sits on remaining natural teeth, while implant-supported overdentures are anchored to dental implants that are surgically placed into jawbone.

Overdentures offer several benefits over conventional dentures, including improved stability, retention. And also prevent further bone loss and aids in preservation of sensory proprioception.

Case Presentation: We present a case of 61-year-old woman was highly motivated for preservation of the remaining natural teeth. Thus, preservation of maxillary natural teeth was performed and the lower canines and premolars were used for supporting the overdenture. Clinically the patient was stable and her periodontium seemed uncompromised so endodontical treatment was performed along with prosthetic rehabilitation.

Discussion: This case discuss the huge advantage of preserving the remaining natural teeth and using it to harbor the denture. Careful case selection and patient compliance is the key to successful overdenture.

Keywords: Bone loss, overdenture, retention, sensory proprioception, stability.

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Introduction

The use of a natural tooth to support a restoration has always been in the eyes of critics who support the view that natural teeth are to preserved till the last breath. Overdentures are commonly used to increase the denture acceptance and quality of life for patients.^[1] Here are some common uses and benefits of overdentures:

Denture Stabilization:

Overdentures are often used to stabilize and secure removable dentures. By attaching the denture to natural teeth or dental implants, overdentures provide better stability and reduce the movement or slipping of the denture during eating or speaking.^[2] This enhances comfort and confidence for denture wearers.

Preservation of Natural Teeth & prevent Residual Ridge Resorption:

In cases where a patient has a few healthy remaining natural teeth, tooth-supported overdentures can be used. These overdentures are designed to fit over the remaining teeth, protecting and preserving them. By retaining natural teeth, the jawbone is better stimulated, which helps prevent bone loss and maintain facial structure.^[3]

Improved Chewing and Speech:

Overdentures offer better chewing efficiency compared to conventional dentures. With increased stability and retention, patients can comfortably eat a wider range of foods, improving their nutritional intake. Additionally, overdentures can improve

speech by minimizing denture movement that can affect speech patterns.

Enhanced Proprioception:

Overdentures distribute the forces of chewing more evenly across the supporting teeth thus the periodontium of the remaining natural tooth help in positive sensory feedback of the patient thus helping in determining the type and bolus of food that she is ingesting giving an increased acceptance or superior masticatory efficiency.^[1]

Case report:

A 61year old female patient reported to the department of prosthodontics with the chief complaint of replacement of missing teeth. The teeth were lost due to endodontical breakdown of tooth. On clinical examination it was found that the patient was partially dentulous in 25, 26, 27 region (Figure 1) and in the mandibular arch teeth present was 33 and 44 region (Figure 2).

Study casts were prepared and proper history taking was done.^[4] The mandibular ridge as being bone deficient immediately was planned for overdenture as a bilateral support could have been established in the mandibular arch along with preservation of lower bone and sensory proprioception. And simultaneously the upper 3 teeth were planned to be preserved followed by fabrication of regular acrylic based removable partial denture. The patient was made aware of the endodontic treatment that she has to undergo in order to preserve the lower canine and premolar for it to be used for enhanced retention and support of overdenture.

The lower canine and premolar were endodontically treated. After the completion of root canal treatment, post space was prepared (Figure 3 and 4) to harbor the dowel copings.^[5] Dowel copings were used in this case instead of short copings was because dowels provide extra amount of retention to the copings as a lot of surface area and support

is derived from the root space of the prepared tooth.

After preparation of the root space to take the dowel, impression of the post space is taken with help of acrylic. The acrylic which has taken up the impression of the prepared post space is then invested and passed through burnout. Inlay wax can also be used to take the impression of the post space. The metal copings are the cemented into the root space with the help of Type I GIC (Figure 5 and 6).

Record base was fabricated followed by the recording of jaw relation.^[2] Anterior try in of patient was done in one appointment followed by posterior try in the next appointment. Tooth arrangement (Figure 9) becomes a critical part in fabrication of overdenture as the space for the artificial teeth to be placed in the wax rim is taken up by the metal copings.

After completion of the tooth arrangement and try-ins, the next step that followed was the lab procedures. After completion of lab procedures final finishing was done and the removable partial denture for the maxillary arch and the overdenture for the lower arch was delivered (Figure10-12).

Discussion:

As a prosthodontist preservation of what remains rather than replacement of what is survivable is our primary goal.^[6] So keeping this golden rule in mind preservation of tooth that can be used as retentive area and support is performed. Just by keeping a canine and premolar on the lower arch not only is the remaining natural bone preserved the proprioception of the patient Is enhanced and the bolus of food that is usually not perceived by a denture using a conventional denture is enhanced by the use of tooth supported overdenture. Superior positive feedback is achievable because of the remaining periodontium of the retained tooth.^{[1][7]}

The need for endodontical treatment is needed in cases of overdenture because of the fact that the remaining teeth can be periapically

affected because of the force that is being generated by the denture. And in order for the teeth to withstand the denture force metal copings are made so that the endodontically treated tooth doesn't fracture because of the chewing or biting pressure.

Various types of copings can be used depending on the inter-arch space available and the need of the patient.^{[8][9]} Dowel types of copings generally provide extra retention and stability in comparison to short copings.^[10] The cervical finish lines of the copings must be smoothed so as to avoid impingement of the gingival structures. Jaw relation and determination of vertical dimension is performed as per the rules followed for conventional dentures.

Tooth arrangement becomes a tricky part in cases of overdentures as the occlusal rim has to make space for not only the artificial teeth but also the metal copings. So, if needed the artificial teeth might have to be trimmed to a lot extent in order to give space for the metal copings. As the artificial teeth are trimmed special care must be given in the wax up procedure in order to avoid any complication in the lab procedures

Conclusion:

A motivated patient is great pre-requisite for construction of overdenture.^[11] Patient willing to maintain periodontal health and preserve natural tooth should be provided with treatment options like overdentures. Preserving the natural teeth not only satisfies the patients need but also helps in preservation of anatomical bone which will further help in added retention and prevent residual ridge resorption.^[8]

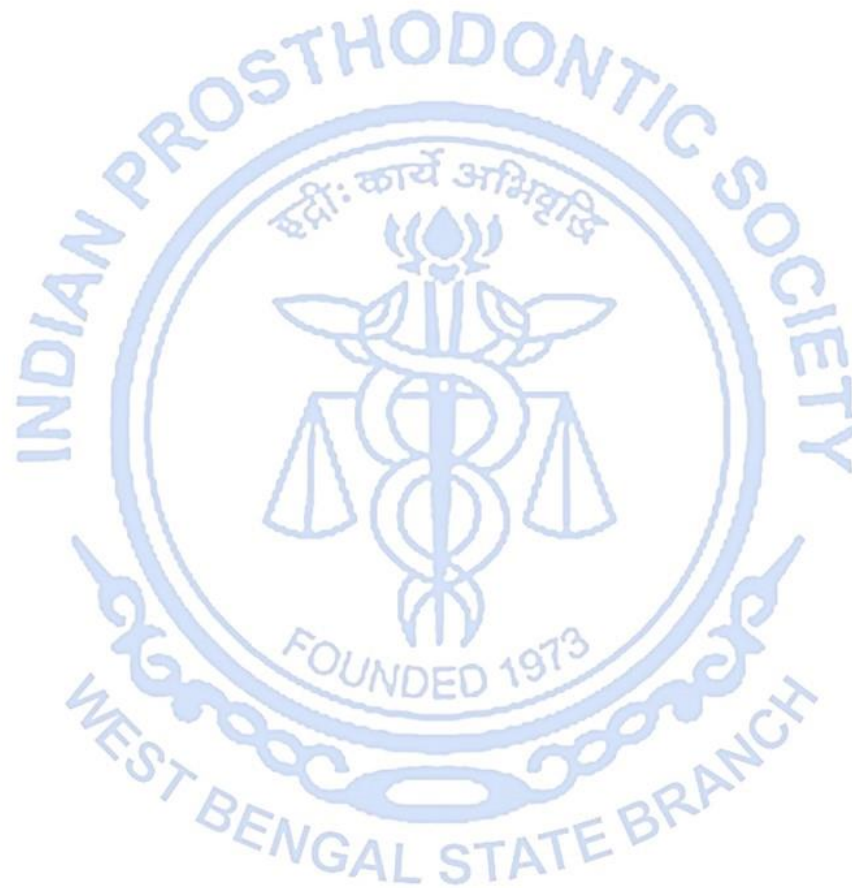
Careful planning of the case is important in patients planning for overdentures because of the few extra appointment and an increased cost because of the periodontal and endodontical appointments that the patient has to undergo.

Motivation of patient along with meticulous case selection and overdenture construction is the key to success of overdentures.^[12] With proper treatment planning acceptance of overdenture is a predictable outcome of the procedure.

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FIGURES



Figure 1



Figure 2

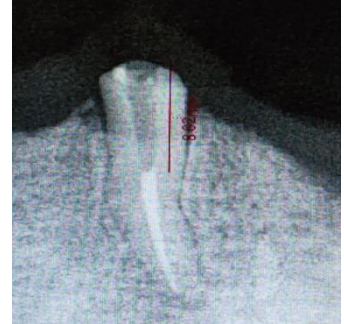


Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12