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A case report on tooth-supported overdentures: Restoring function and aesthetics

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Abstract

Introduction: Tooth loss in elderly patients, often due to periodontal disease or caries, impacts both function and aesthetics, leading to reduced chewing ability, poor nutrition, and negative psychosocial effects. Tooth/implant-supported overdentures, offer a practical solution. They delay bone resorption, enhance denture stability, and improve masticatory function. Overdentures are especially beneficial for patients with few remaining teeth, providing a viable alternative to conventional dentures and preserving oral health.

Case report: A 65-year-old partially edentulous female patient presented with difficulty in mastication and missing anterior teeth. Clinical examination revealed remaining teeth with no mobility or periapical pathology. A tooth-supported overdenture was planned involving root face preparation. The treatment successfully improved function, aesthetics, and patient satisfaction.

Discussion: Preventive prosthodontics focuses on preserving remaining oral structures to delay or eliminate the need for future treatments. Overdentures utilize natural teeth to maintain periodontal ligament function, enhance masticatory efficiency, and reduce bone resorption. Despite their advantages, overdentures are underutilized due to cost, technique sensitivity, and attachment complexity. This case underscores the benefits of prosthetic reconstruction with tooth-supported overdentures in preserving the alveolar bone and improving proprioception

Conclusion: As preventive prosthodontics gains emphasis, overdentures are becoming more common for patients with few remaining teeth. Unlike implant-supported options, overdentures offer a cost-effective solution by utilizing natural teeth for enhanced support, retention, and stability. By preserving the residual ridge, overdentures help reduce bone resorption and maintain proprioception through the periodontal membrane. These prostheses can also be easily relined or rebased into conventional dentures if abutment teeth are lost.

Keywords: Tooth loss, overdenture, tooth-supported overdenture, partial edentulism, alveolar bone resorption, proprioception, prosthodontics

Introduction

The loss of some or all teeth is a common finding in old age patients. Which can be due to various factors including periodontal problems, caries and other factors. Loss of teeth greatly affects the persons personality as they become conscious of their looks and loss of function plays majority of the role in this ^[1]. This can further deteriorate health and decreasing the weight which in turn will lead to nutritional deficiency. Patients who have reduced functional dentition suffer from poor nutritional status, mental health issues, decreased chewing abilities, and unfavourable social effects, all of which lower their general quality of life ^[2]. Therefore, affecting their overall health. So, a treatment plan according to each patient is need to be formed and proceed forward if the patient agrees with that. Patients who are partially or completely edentulous have access to a wide variety of prosthetic alternatives, including implant-supported, fixed, and removable prostheses. An overdenture strengthens the denture foundation area, delays the resorption process, and boosts the denture's masticatory effectiveness.

Ovrdenture is defined as any removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants. Additionally, it can

be described as a dental prosthesis that is supported partially by natural teeth, tooth roots, and/or dental implants [3]. The use of overdentures is not a recent innovation, as it has been in practice for over a century. For an overdenture to be a good option to treatment, it must be successfully restored by endodontics and periodontics, as well as having a significantly lower crown-to-root ratio. It has been demonstrated that, once the crown-to-root ratio is decreased, even the mobile teeth that remain after periodontal therapy provide good abutments for an overdenture. Half of the roots employed as overdenture abutments in a four-year study by Renner et al. remained stationary. Additionally, 25% of the initially mobile roots became stationary, while 25% of the initially mobile roots became less mobile. Therefore, it is

reasonable to state that overdentures, as opposed to total extraction and complete denture fabrication, should be the preferred course of treatment for individuals with few remaining teeth.

For patients who have few teeth left in an arch, an overdenture is recommended. Additionally, it is favoured for patients who require a single denture; these individuals may have high palatal vaults, unfavourable tongue placements, or muscular attachments that make it difficult for the prosthesis to remain stable and retain its position [6, 7, 8].

Numerous benefits and drawbacks of overdentures supported by teeth have been extensively discussed in the literature [9-12] and summarized in Table 1.

Advantages	Disadvantages
Preserving the height of the alveolar bone consequently improves the denture's support, stability, and retention.	A collaborative approach involving various specialties is essential, including procedures like endodontic therapy, restoration of abutments, or the use of precision attachments
Maintaining proprioception is important for regulating the biting force applied to the denture.	The treatment is time consuming and requires more number of appointment.
By reducing the coronal portion of the abutment teeth the crown-to-root ratio of the teeth decreases and that helps in increasing the abutments lifespan.	It is expensive than conventional complete denture. As we need to provide endodontic treatment and fabricate cast copings or precision attachments.
Transition from overdenture to complete denture is easy.	Prominent bony undercuts near abutment teeth, mainly in the mandibular anterior region, may not allow the denture flanges to full extension and which will ultimately compromise the retention and aesthetic of the denture.
	There is an increased risk of fracture in the denture base due to its thinness.
	In cases with limited inter-occlusal space there is difficulty in teeth arrangement in place of attachments.
	Follow-up of the patients are necessary to remind check patients oral hygiene status and remind them to maintain good oral hygiene.

A successful overdenture prosthesis requires more consideration when choosing an abutment. The criteria for

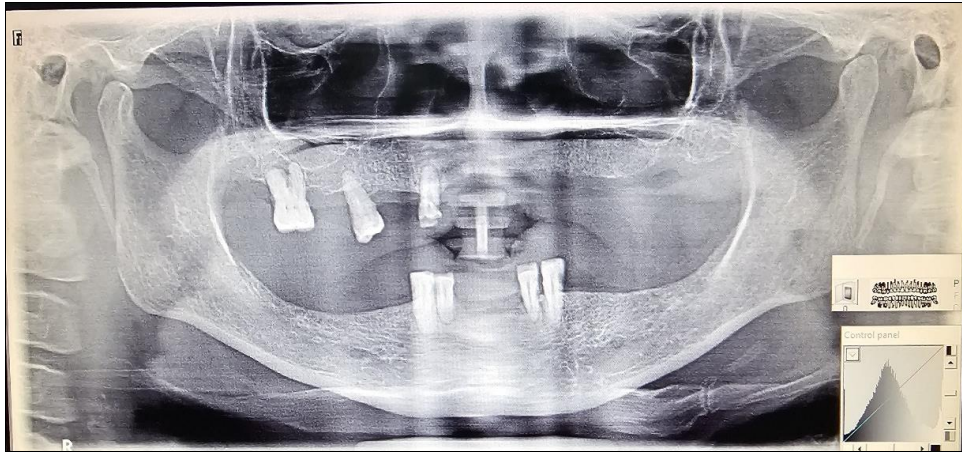
selecting abutments can be found in Table 2 [13-15].

Consideration factors	Criteria
Periodontic consideration	Periodontally healthy or a tooth and a reduced but healthy periodontium and a support of at least 50% of alveolar bone. The abutment mobility should be minimal.
Endodontic considerations	Preferably a single-rooted tooth with root canal morphology that eases root canal treatment.
Structural considerations	The abutment should be restorable, having sufficient supragingival tooth structure.
Abutment location/distribution consideration	The abutment should have at least one tooth in each quadrant (commonly canine or premolars), and the roots should be ideally symmetrically distributed.

Clinical report

A sixty-five years old female patient reported to the Department of Prosthodontics and Crown & Bridge of Jaipur Dental college, Jaipur with chief complaint of difficulty in mastication and missing teeth in front region. On examination, it was found that multiple teeth were missing in both the arches and the patient had no previous dentures. Maxillary and mandibular arch were partially edentulous. The teeth present were 12, 15,17,32, 33, 42 and 43. No mobility and periapical pathology was reported in the clinical and radiographical examination. Primary impressions for the maxillary arch and mandibular arch were made with alginate. The impressions were poured with dental stone and special

trays were fabricated using self-cure acrylic resin. For tooth-supported overdenture bare root face tooth preparation [8] was done w.r.t 12, 15, 17,32, 33, 42 and 43. Border moulding was done for both the arches with low fusing green stick compound followed by final impression made with zinc oxide eugenol (ZOE) impression paste. Temporary denture base and Occlusal rims were fabricated on to which jaw relations were recorded and then 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 finally esthetics. The patient's consent was obtained, and the final denture was processed using heat-cured acrylic resin.



Pre-op OPG



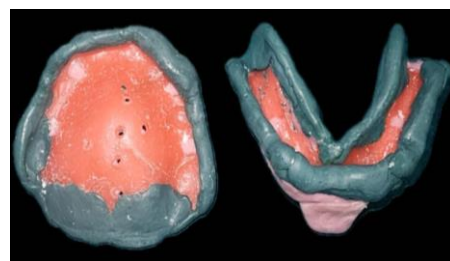
Pre-op photographs



Diagnostic casts



Post-op photographs



Border moulding



Facebow transfer

Try-in



Denture delivered

Discussion

Preventive prosthodontics put more importance on the preservation of all the remaining structures of the oral cavity through any dental procedure which can delay or eliminate the need for future prosthodontic treatment. An overdenture is also one of the important preventive treatment modalities. A completely edentulous patient goes through a number of events which effect the patients overall view of themselves [16].

The loss of tooth is one of the changing factors in one's life as there is a complete change in there personality, appearance, eating habits and everything so it should be considered as an emergency and treated as soon as possible. The one thing that the natural teeth have but is missing from all other prosthesis is the presence of Periodontal Ligament (PDL) which in turn will provide the proprioception. Through Pdl we get the feeling of the presence of teeth. So, excess force is not applied as we are more precisely able to know when the teeth are in occlusion rather than in complete denture. An overdenture enhances denture foundation area, improves masticatory effectiveness, and postpones the resorption process.

Tooth supported overdentures are not used by many dentists as they are expensive and technique sensitive. Many dentists don't know the indications and application of various of prefabricated attachments, and their fear of failure, frequent repairs, replacements or adjustments. So, they tend to extract all the teeth and replace it with a complete denture. DeVans golden statement: "Perpetual preservation of what remains is more important than the meticulous replacement of what is missing" should be kept in mind. Prieskel states that there are three methods for preparing the abutment for overdentures: The preparation of root surface just above mucosal level (a) bare root face (b) dome-shaped gold coping; the use of attachments, and (c) thimble-shaped gold copings [17, 18]. Depending on the needs of the clinical case, other attachment mechanisms can also be used to give additional retention in overdentures, improving patient acceptability. But these attachments are costly and not every patient is eager on their use.

In this case report barefoot preparation of all the remaining teeth were done and denture is delivered on that. These dentures assist in the preservation of alveolar bone, provision of proprioception and stability of the prosthesis.

However, if more retention is required then various

attachment can be used. The main disadvantage of the overdenture is difficulty in the maintenance of oral hygiene. Proper post insertion instructions should be given and regular follow up should be done in order to increase the longevity of the prosthesis. After the loss of all the teeth it can be converted into conventional complete denture.

Conclusion

As the emphasis on preventive prosthodontics is increasing, The use of overdentures as an alternate treatment option is increasing in patients with few remaining teeth. When compared to more costly treatment options like implant-supported overdentures, overdentures made with natural teeth may be a more cost-effective solution. Overdenture keeps the teeth as part of the residual ridge. As a result, the patient receives a denture with significantly greater support than any traditional appliance. It helps in improving the retention and stability of the final prosthesis. It helps in decreasing residual ridge resorption. Proprioception supplied by the periodontal membrane is also present. It can be easily converted into conventional complete denture when the abutment teeth are lost or to be extracted because of any reason through relining and rebasing as it has basic design similar to that of complete denture.

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