

Tooth Supported Overdenture with an Attachment: A Case Report

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ABSTRACT

Over-denture is most commonly used treatment for elderly patient with two or more teeth remaining in the arch. The root of the remaining teeth preserve the alveolar ridge, provide sensory sense, improve the stability and retention of denture as compare to conventional complete denture, on using coping or attachment over the remaining part of tooth. The stability and retention of the denture is enhanced. In this particular case report the fabrication of a tooth supported over-denture retained with extra-radicular attachment has been discussed.

Key Words: Attachment, over-denture, resorbed ridge, extra-radicular

INTRODUCTION

Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontic problems and overdenture is an important part as the preventive treatment modality¹. A complete denture patient goes through a sequel of events like loss of discrete tooth proprioception, progressive loss of alveolar bone, transfer of all occlusal forces from the teeth to the oral mucosa and the most depressing sequel is the loss of patient's self-confidence.

According to GPT 9, 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. It is also called as

overlay denture, overlay prosthesis and superimposed prosthesis².

Overdenture is indicated in patients with few remaining retainable teeth in an arch. It is also preferred in patients with mal related ridge cases; patients needing single denture; patients with unfavorable tongue positions, muscle attachments, and high palatal vault, which render the stability and retention of the prosthesis difficult³⁻⁵. Overdentures are contraindicated in patients with questionable oral prophylaxis, systemic complications, and inadequate inter arch distance.

An over-denture delays the process of resorption, improves denture foundation area and increases masticatory efficiency. De-Van golden statement: "Perpetual preservation of what remains is more important than the meticulous replacement of what is missing" still rings true, holds true for such dentures. Over-denture is a definitely a better option as compared to a removable complete denture prosthesis, which certainly has its drawbacks. Over-denture is one of the most practical measures used in preventive dentistry. In a 4 years study by Renner et al., it was found that 50% of the roots used as over-denture abutments remained immobile⁶.

Advantages these over-dentures include preservation of alveolar bone, proprioception, enhanced stability and retention and maintenance of vertical dimension of occlusion⁷⁻¹⁰. It is also useful for patients with congenital defects such as

oligodontia, cleft palate, cleidocranial dystosis and Class III occlusion. It can be easily converted to complete denture over a period of time. The most important advantage is that the patient has the psychological benefit of having his own teeth which outweighs all the disadvantages stated. Retentive devices included into denture teeth result in improved retention as well as support.

Disadvantages include meticulous oral hygiene maintenance to prevent caries and periodontal disease. The over-denture tends to be bulkier and over contoured Encroachment of inter-occlusal distance. This treatment modality is an expensive approach with frequent recall check-ups of the patient than a conventional removable complete denture.

In overdenture treatment, the teeth are included as part of the residual ridge. An important periodontal requisite with over denture abutment is adequate zone of attached gingiva^{3,7,8}. Tooth-supported Overdenture treatment options are boundless and there are innumerable options to choose from for different cases.

CASE REORT

A 65-year-old male patient, with the chief complaint of difficulty in chewing hard food and sagging appearance of his face reported to the Department of Prosthodontics, ITS dental college, hospital and research center, Greater Noida. The patient gave a history of loss of teeth for 5 years due to gum diseases.

Intra-oral examination revealed that the maxillary arch was totally edentulous and the mandibular arch was partially edentulous (Kennedy Class I Modification 1). The remaining teeth were mandibular canines and premolars (34, 43) with normal alveolar ridge mucosa.

The maxillary residual ridge was favorable with adequate bone height, width, and favorable palatal form, while mandibular ridge was moderately resorbed. After thorough evaluation, clinical and radiographic, it was decided to retain the

mandibular teeth (34,43), following patient concern ,tooth supported overdenture for mandibular arch and conventional complete denture for maxillary arch.

Diagnostic impressions were recorded with the help of impression compound for the edentulous maxillary and partially edentulous mandibular arches (shows in figure 3). Custom trays were fabricated on the diagnostic models using auto polymerizing resin. Final impressions of the maxillary and mandibular arches were recorded after border molding using low fusing impression compound by ZNO-Eugenol for both arches (shows in figure 4). Temporary record bases and occlusal rims were fabricated for recording the maxilla-mandibular relations (shows in figure5, 6). After face bow transfer the established records were transferred to semi adjustable articulator (shows in figure 7), and arrangement of teeth was done with the biomechanical principles to achieve bilateral balanced occlusion. After try- in verification (shows in figure 8), maxillary and mandibular dentures were processed using the conventional methods of processing (shows in figure 10).

The mandibular canines and premolar were already endodontically treated and obturated. One size drill was used to prepare the radicular space for the uni-anchor attachment after removal of the gutta-percha from the root leaving one-third of the material in the apical portion, for the placement of the ball attachment within the root surface (shows in figure 11). Once adequate post space on mandibular canines and premolar was created, the uni-anchor attachments were inserted individually into each canal for evaluating the fit and cemented by resin cement (shows in figure 12). Bilaterally, the intaglio surface of the mandibular denture are marked by incredible pencil in the area of ball attachment in canine and premolar and relieved by using carbide burs to incorporate the female component (nylon housing). The female component was attached to the mandibular dentures after picking them up

from the male components in the corresponding relieved areas (shows in figure13). Excess resins from the areas were

trimmed, finished, and polished dentures were then inserted in the patient's mouth providing support and proprioception.



FIGURE 1-MAXILLARY ARCH



FIGURE 2 -MANDIBULAR ARCH



FIGURE 3 -PRIMARY IMPRESSION



FIGURE 4-FINAL IMPRESSION



FIGURE 4 -JAW RELATION



FIGURE 5-FACE BOW RECORD

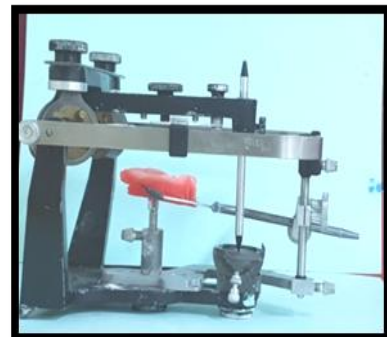


FIGURE 6- FACE BOW TRANSFER



FIGURE 7-TRY IN



FIGURE 8-FINAL PROSTHESIS

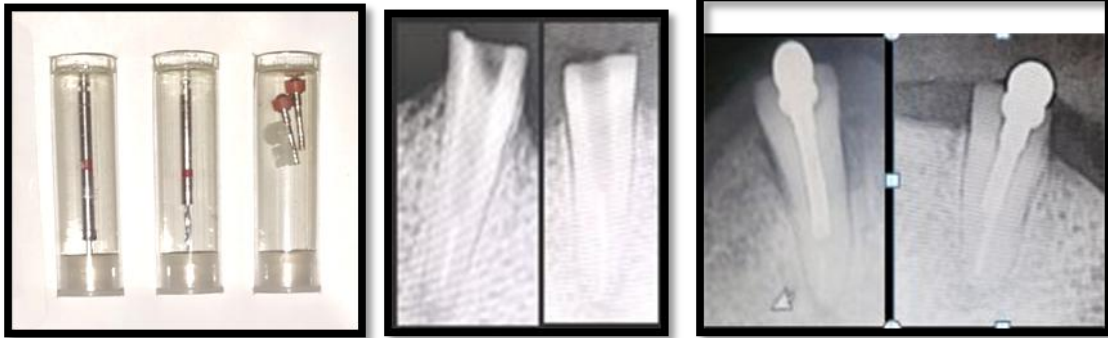


FIGURE 9-ARMAMENTARIUM FOR POST SPACE FORMATION

FIGURE 10-AFTER CREATING POST SPACE

FIGURE 11-IOPA AFTER PLACING BALL ATTACHMENT OVERDENTURE POST

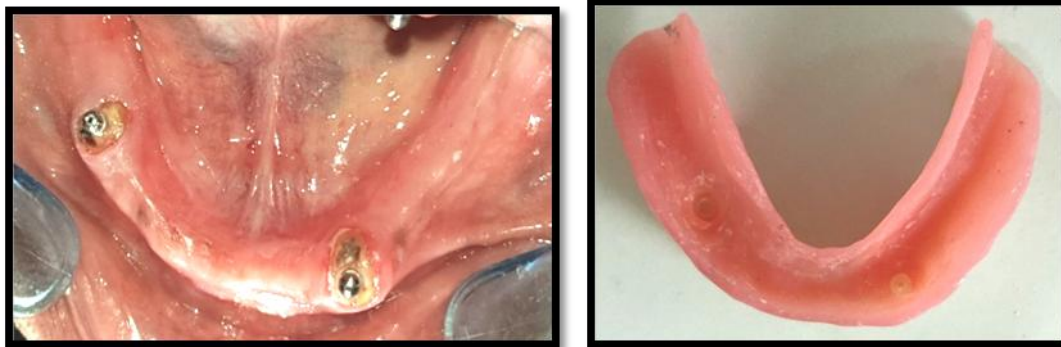


FIGURE 12-OCCLUSAL VIEW AFTER PLACING BALL ATTACHMENT POST

FIGURE 13-PICKUP OF NYLON HOUSING BY USING SELF CURE ACRYLIC RESIN

DISCUSSION

The prospect of losing all the teeth can be very disturbing for a patient, bringing down patient's morale as it is an in direct reminder for being dependent on others and losing senescence. In such conditions, overdenture option as preventive prosthodontic treatment modality should be regularly imbibed in our dental practices because of its innumerable advantages. Crum and Rooney¹ graphically demonstrated in a 5 years study that an average loss of 0.6 mm of vertical bone in the anterior part of the mandible of overdenture patients through cephalometric radiographs as opposed to 5.2 mm loss in complete denture patients.

Overdenture helps reduce shrinkage of surrounding bone, reduces pressure on the alveolar ridge and proprioception is maintained.¹⁰ There is the presence of directional sensitivity; dimensional discrimination; canine response and tactile sensitivity.⁴ The average threshold of sensitivity to a load was found to be 10

times as great in denture wearers as in dentulous patients^{5,6}. Rissin *et al.* in 1978 compared masticatory performance in patients with natural dentition, complete denture and over denture. They found that the over-denture patients had a chewing efficiency one-third higher than the complete denture patients⁷. Overdenture with attachments can redirect occlusal forces away from weak supporting abutments and onto a soft tissue or redirect occlusal forces toward stronger abutments thereby resulting in superior retention⁸.

Overdenture attachments are classified either as studs, which connect the prosthesis to the individual tooth or as bars which connect the prosthesis to the splinted abutment teeth. They are further classified as rigid or resilient. However, since edentulous ridges and the remaining roots are often compromised, the prosthesis that relies on resilient attachments is better able to divert occlusal forces away from weak abutment teeth.

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