CASE REPORT

Attachment Retained Overdenture: A Case Report

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ABSTRACT

Overdenture, since long has been the choice of treatment in patients with partially edentulous arches, particularly in mandibular jaw for the advantages associated with it in the form of improved proprioception, decreased ridge resorption, better retention, stability, and support. Significant advances in the treatment modality have popularized the usage of attachment in the abutment tooth for enhanced retention, stability, and support as compared to conventional overdenture fabricated on abutment tooth. This case report describes a technique for the fabrication of overdenture on mandibular canines, by the incorporation of extra radicular attachment, and the corresponding components in the tissue surface of the mandibular complete dentures.

INTRODUCTION:

Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate the inevitable problems. Preventive prosthodontics advocates use of overdenture as one of the treatment modalities by the practicing dentists. It is further emphasized that patient treated with overdenture demonstrate less vertical alveolar bone resorption in comparison to the conventional dentures and in turn preserves the residual alveolar bone. The success of overdenture is dependent on maintaining oral hygiene at an adequate level. The choice of attachment is an important factor and commonly used are bar and clip, ball and O-ring, extracoronal resilient attachment or magnetic attachments. Usually, the choice is determined according to number, distance, and location of the remaining natural teeth or at the discretion of the prosthodontist on his clinical experience. Thus, the preservation of roots is an effective way to improve prosthesis support and can be associated or not, with retention systems. The aim of this clinical case report was to present an oral rehabilitation of mandibular root-supported overdenture using an intra-radicular system. Most patients are not satisfied with the retention and stability of their complete dentures. The presence of healthy roots necessitates the fabrication of attachment retained overdenture by preserving the roots. Retained healthy roots provide retention, stability, and support of the overdenture, preserves residual ridge height, and maintains proprioceptive stimulus through periodontal membrane, and has economical and psychological benefits.

Case Report

A 63-year-old female patient complained of difficulty in chewing hard food and sagging appearance of her face. The patient gave a history of loss of teeth for 4 years due to gum

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diseases.

On examination, the maxillary arch was totally edentulous and mandibular arch was partially edentulous of Kennedy Class I Modification I. Extraoral examination suggested a loss of vertical dimension of the face and unsupported lips. The patient had a convex profile, and temporomandibular joint evaluation did not suggest any abnormality. Intraoral examination revealed remaining mandibular canines and premolars with normal alveolar ridge mucosa. The maxillary residual ridge was favorable with adequate bone height and width, and favorable palatal form, while mandibular ridge was moderately resorbed. After clinical and radiographic evaluation, a treatment plan in consultation with the patient was devised to retain the mandibular canines and fabricate an overdenture in the mandibular arch opposing conventional maxillary complete denture. The proposed treatment included maxillary conventional denture and mandibular overdenture retained with uni-anchor extraradicular attachment in an indirect technique on bilateral mandibular canines (Figure 1). Informed consent was obtained from the patient for the proposed treatment. The mandibular canines were endodontically treated and obturated leaving one-third space in the cervical portion of the root for the attachment. Once the teeth were asymptomatic, were reduced in size for more favorable crown root ratio. Post-endodontic treatment and one size drill (Figure 2) was used to prepare the radicular space for the uni-anchor attachment after removal of the gutta-percha from the root leaving one-fourth of the material in the apical portion, for the placement of the stud attachment within the root surface (Figure 3). Once adequate post space on mandibular canines bilaterally was created, the uni-anchor attachments were inserted individually into each canal for evaluating the fit and its parallelism. The extra radicular uni-anchor attachments were cemented in the root space after trial fitting using glass ionomer cement (Figure 4). Diagnostic impressions were recorded with the help of alginite impression material (Zelgan) for the edentulous maxillary and partially edentulous mandibular arches. Custom trays were fabricated on the diagnostic models using autopolymerizing resin. Master impressions of the maxillary and mandibular arches were recorded after border molding using tracing stick and ZNO-Eugenol for the maxillary edentulous ridges, and putty consistency addition silicone for peripheral tracing and light body as wash impression for the edentulous mandibular arches. Temporary record bases and occlusal rims were fabricated for recording the maxillomandibular relations.

The established records were transferred to a mean value articulator, and arrangement of teeth was done with the biomechanical principles to achieve bilateral balanced occlusion. After try-in verification, maxillary and mandibular dentures were processed using the conventional methods of processing. Bilaterally, the intaglio surface of the mandibular denture in the canine area was relieved using carbide burs to incorporate the female component. The female component was attached to the mandibular dentures after picking them up from the male components in the corresponding relieved areas (Figure 5).

Autopolymerizing resin was used for luting the attachments on the tissue surface of the mandibular dentures. Excess resins from the areas were trimmed, finished, and polished dentures were then inserted in the patient’s mouth providing support and proprioception (Figure 6).

Discussion

According to the reports in literature, it is common to observe mutilated dentition due to periodontal disease and dental caries in the elderly population. In most situations, the patient is limited to being rehabilitated with complete dentures due to the fact that other options are unsuitable. However, the use of selected teeth in strategic positions can greatly improve the final treatment result in terms of overdenture stability and retention.11 Progressive alveolar atrophy after tooth extraction can be prevented by retaining teeth or tooth root beneath an overdenture. To keep a few teeth and use them or their roots for a tooth or root supported overdenture has been shown to substantially reduce the bone loss in the mandible.1
However, patient cooperation is mandatory for maintaining adequate oral hygiene to avoid caries and periodontal disease of the retained teeth. There are relatively few studies on the survival of tooth and root supported overdentures, but those available have demonstrated a wide range of survival rates, from very good to relatively poor results, and a great need for prosthetic maintenance. The considerable reduction in crown root ratio and the dome-shaped configuration of tooth abutment along with careful adjustment of contiguous denture base facilitates an axial resolution of occlusal forces. The tensile stimulation of periodontal fibers results in the deposition of bone followed by a concomitant decrease in abutment mobility. The support provided by the abutment teeth is in addition to that supplied by the residual alveolar ridges. Stability and support are enhanced by the vertical vector component of the teeth retained in the alveolar ridge. Preservation of natural teeth for an overdenture preserves sensory inputs from the periodontal mechanoreceptors and is superior to achieved by the oral mucous membrane. In case of mandibular abutments, the tensile forces on the periodontal ligament fibers may lead to deposition of bone, which facilitated improved retention, stability, and support of the mandibular denture over conventional dentures. These periodontal receptors by their proprioceptive feedback mechanism actively influence muscles of mastication and thereby the cyclic temporomandibular joint movements.

![Figure 1: Attachments for retaining the overdenture](image1)

![Figure 2: One step drill provided by the manufacturer for intra radicular drilling conforming to the size of the attachment](image2)

![Figure 3: Gutta-percha removal and post space preparation for the extra radicular attachment retention](image3)

![Figure 4: Cemented attachments in the mandibular canine](image4)
Attachment retained overdenture has become an integral part of prosthodontic treatment as an alternative to conventional mandibular dentures to overcome the problems of retention associated with it. Among possible roots to be used to support the overdenture, the canine is a tooth that better exhibits characteristics associated with the support. This is because of its large root with a greater periodontal area for attachment and also due to its localization in the transition area between anterior and posterior teeth. Another advantage of such attachment is dual retention and the design of the pivoting male, which allows a resilient connection for the prosthesis without any resulting loss of retention.

The attachment system supposedly plays an active role in prosthesis success rates, but demands maintenance and recall to prevent complications. Stud attachments revealed complications such as being time-consuming and incurring costs related to wearing and loosening of components that had to be changed. There have been reports of movement in different directions, resulting in damage and wear. Bearing this in mind, it is important that these complications be recorded when analyzing prosthesis maintenance during follow-ups.

Conclusion

The root supported overdenture is a better alternative for a treatment option to conventional dentures since the proprioception is maintained and improves stability and retention. It is necessary to have patient awareness about good oral hygiene to maintain the roots so that treatment remains satisfactory for a long time.

Overdenture supported by natural teeth is one of the best treatments available for the edentulous condition. Despite recent development in dental implantology, the conservative approach of root preservation is still valid. Greater emphasis must be given on proper case selection, diagnosis, and treatment planning. By preserving the submerged root or teeth for overdenture, alveolar bone resorption can be reduced considerably. Furthermore, there will be a drastic improvement in retention, stability, and support of the prosthesis. Overdentures thus become an alternative treatment for patients advised for total extraction. Oral hygiene instruction must be given to the patient and reinforcement of the same has to be done. Recall examinations with radiographs at regular intervals of 6 months or less will maintain the prosthetic, restorative, and periodontal status of the patient at acceptable levels, which in turn leads to the success of the overdenture therapy.

References