CASE REPORT

Management of partially Edentulous Patient with Overdentures using Bar Attachment

Dhananjay Joshi et al

ABSTRACT

The use of teeth as overdenture abutments is a common form of treatment. However, most of the abutments are used only to support complete dentures. Simple attachment systems like bar attachments can improve the retention of the prosthesis. This article presents a case where bar attachments have been used to help retain removable prostheses.

Keywords: Bar attachment, Overdentures, Partially edentulous patient.

INTRODUCTION

In the past, when patients used to visit the dentist with few badly broken teeth, the treatment modality was extraction of the remaining teeth followed by a complete denture. These complete dentures were satisfactory in the beginning but with each subsequent year of use, patients gradually became intolerant due to continuous resorption of the alveolar bone. Shakespeare has said about old age, “It is the last scene of all, that ends strange eventful history, is the second childishness, and near oblivion. Sans teeth, sans eyes, sans taste, sans everything.” It is the responsibility of the dentist to prevent tooth loss whenever possible. The residual ridge resorption is inevitable after extraction of teeth. However, the extent of this process varies depending on individual anatomic, biologic, and mechanical factors. Retention of teeth or roots in the alveolar bone can improve bone maintenance around and between these structures. Bone maintenance is the most significant advantage of a tooth-borne complete overdenture which further improves retention and stability. Tooth-supported overdentures could be fabricated with passive retention using abutments with coping or with active retention like attachment overdentures. However, use of attachments introduces another factor in prosthetic design, i.e., need for a critical attachment prosthesis relationship. The requirements for each type of attachment differ with the availability or desirability of resiliency and the adaptation of the denture base over the denture-supporting tissues.

CASE REPORT

A healthy, 56-year-old male reported with the chief complaint pertaining to the lack of function and esthetic deficiency due to broken dentures. A detailed medical, dental, and social history was obtained. Intraoral examination showed completely edentulous maxillary arch and partially edentulous mandibular arch (Figs 1 and 2). The patient related the history of tooth loss as a result of unavailability of dental care earlier in life leading to caries and periodontal problems. The teeth present were #33 and #43, which were sectioned at cervical region to give overdenture on root stumps 2 years earlier. These root stumps were treated endodontically and were sealed using amalgam stops. Radiological examination included intraoral periapicals of #33 and #43 and orthopantomograph to exclude any radiological pathology. Treatment plan was developed with the following objectives: Reduce the loss of the teeth, restore masticatory function, and improve the esthetics. Based on diagnostic findings, it

Fig. 1: Completely edentulous maxillary arch

1Professor, 2Professor and Head, 3Senior Lecturer, 4Reader
1-4Department of Prosthodontics, YMT Dental College and Hospital, Navi Mumbai, Maharashtra, India

Corresponding Author: Dhananjay Joshi, Professor, Department of Prosthodontics, YMT Dental College and Hospital, Navi Mumbai, Maharashtra, India, Phone: +919820065874, e-mail: dentistdjjoshi@gmail.com
was concluded that #33 and #43 can serve as abutments in which attachment can be placed for overdenture. Diagnostic mounting revealed adequate interarch space for the necessary components of bar attachment, favorable alignment of abutments, and functional placement of denture teeth without compromising esthetics. Post space preparation was done using Peeso reamer and cast post patterns were made using pattern resin by direct technique. These patterns were then cast and checked for passive fit on abutments. Pickup impression was then made and poured. Parallelism was assessed using milling machine, necessary adjustments made, and these posts were then cemented in the post space using type I glass ionomer cement. A prefabricated pattern for bar attachment (male component) (Fig. 3) available commercially was used to make pattern for bar attachment. After cementation of the cast posts, an impression was made to make pattern for bar attachment. Patterns for coping were then made on cast and a prefabricated pattern was attached to copings (Fig. 4). This entire assembly was then cast using base metal alloy, polished and finished. This was then checked intraorally for passive fit and gingival clearance. It was then luted intraorally using glass ionomer cement (Fig. 5). Peripheral molding was done and final impressions were made. While making mandibular final impression, female components were placed on the horizontal bar intraorally so as to record space required. Face bow transfer was made and the cast mounted on a semi-adjustable articulator. Interocclusal records were made, horizontal and lateral condylar guidances were set, maxillary and mandibular anterior teeth arranged, and the incisal guidance was adjusted. The posterior teeth were set in a bilateral balanced occlusion. The trial dentures were then tried in the mouth, vertical dimension verified, centric and eccentric contacts were evaluated. The facial and functional harmony was studied and patient’s approval obtained. The dentures were then waxed and processed. After curing was completed, laboratory remount and occlusal adjustment was done. Finally, the dentures were finished and polished. The female component (metal sleeves with nylon housing) of an attachment was then attached to the intaglio surface of
the mandibular denture using autopolymerizing acrylic resin. For this purpose, these metal sleeves with silicone housing were placed on predetermined position on the bar intraorally and self-cured acrylic resin was added to intaglio surface of the denture to attach these metal sleeves with denture. The patient was asked to close in centric occlusion till the acrylic resin was set. The denture was then adjusted and equilibrated (Figs 6 and 7). Post insertion instructions were given along with a recall appointment. The following day, the mouth was observed for sore areas and final occlusal adjustments were made.

DISCUSSION

According to De Van’s dictum, preservation of whatever teeth remains in patient’s mouth is more important than meticulous replacement of the missing teeth. Thus, preventive prosthodontics emphasizes the importance of any procedure that can improve prognosis. Crum and Rooney\(^5\) in a 5-year study found that retention of mandibular canines for overdentures led to preservation of alveolar bone. Further, Roumanas et al\(^6\) concluded that anterior mandible resorbed four times faster than maxillary arch with conventional dentures. He also found that overdenture patients had a chewing efficiency which was one-third higher than that of complete denture wearers. The success of the overdentures depends upon the proper attachment selection for the particular case. Attachment selection is based on available interarch space, amount of bone support, opposing dentition, alignment of the abutments, clinical experience, maintenance of oral hygiene, and cost.\(^7\) Splinting of two or more teeth with a bar produces stability similar to the rigid stud type attachment when the overdenture is in place. With bar fixation, a stronger and a weaker tooth can be splinted, with the result that the stronger tooth strengthens the weaker tooth. Because the bar is close to the alveolar bone, forces of mastication exert much less leverage to the abutments. Finally, the bar joint offers slight vertical and rotational movements of the denture as well as a stress breaker action. The technical work required is minimal and can be carried out at chair side, thus making it cost-effective.

CONCLUSION

The concept of overdentures provides a positive means of delaying the process of resorption of alveolar bone. Although it is a feasible alternative, it is not often used to its full potential. Careful case selections, abutment preparation, maintenance of oral hygiene as well as periodic recall are keys to successful overdenture rehabilitation.

REFERENCES