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Case Report

A CUSTOMIZED BAR SUPPORTED OVERDENTURE: A CASE REPORT

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A R T I C L E I N F O

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A B S T R A C T

The concept of conventional tooth-retained overdentures is a simple and cost effective treatment than the implant overdentures. When few firm teeth are present in an otherwise compromised dentition, they can be retained and used as abutments for overdenture fabrication. This helps improve the retention and stability of the final prosthesis significantly. Bone is a dynamic tissue. The extraction of teeth results in the initiation of the bone resorption pattern. However, when tensile stress is received by bone, additional bone formation takes place. Such stresses occur when occlusal forces are transmitted to the alveolar bone by the periodontal ligament. This principle helps preserve bone. The concept of overdentures may not be the elixir, but it is a positive means for delaying the process of complete endentulism and helps in the preservation of bone. To top it all, it gives the patient the satisfaction of having prosthesis with his natural teeth still present. In this article, case report with a customized bar supported overdenture with copings is discussed.

INTRODUCTION

Patient aged 62-year-old female came to the Department of Prosthodontics came to get her missing teeth replaced. 37, 38 and 48 were present [Figure 1] . Diagnostic casts were articulated at the anticipated vertical dimension of occlusion. Vertical dimension recording was easier because of the presence of a molars. The diagnostic articulation helped in assessing the available inter-arch space. Proposed abutment teeth 37, 38 and 48 were prepared on the diagnostic cast, and the ability to accommodate bar and cast copings was assessed. After careful planning, a final treatment plan was given to the patient with the fabrication of a mandibular overdenture with customized bar between 37,38 and 48 with copings over abutments. A bar is especially useful when abutments are misaligned or nonparallel to one another, making it harder to develop a common path of placement between the abutments and the denture base. The bar attachment provides a separate, parallel path for placement of retentive bar-clips located in the denture base. When more than two abutments were present, parallel placement of the prosthesis was difficult to achieve thus a bar attachment was a better choice. Elective endodontics was carried out with teeth 37, 38 and 48. Abutment teeth were prepared in a dome-shaped contour and hemispherically rounded in all dimensions. The height of the abutment teeth was 3-4 mm projecting just above the gingiva. The exposed dentin of the abutment was polished and treated with fluoride varnish. Indirect cast coping impression was made [Figure 2] and the cast poured in die stone.

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A rectangular wax pattern was made for the bar framework between 37,38 and 48 with inlay wax (Blue inlay wax, Kamdent, United Kingdom). Individual coping was made over all these three molars. The bar framework was made egg shaped with thinnest portion resting on the ridge (modification of Dolder bar design). An adequate gap of 3 mm was provided above the ridge for adequate clearance. Parallelism of the abutment coping was checked by the surveyor. The patterns were connected using 2 mm sprue former wax (Bego, Germany), invested, [Figure 3] and [Figure 4] burnout and casting of the framework were done in Co-Cr alloy. The bar framework with metal copings on molars was finished and polished. It was tried in the patient's mouth, and the fit was found to be satisfactory.

A final impression of the lower arch was made using regular body elastomer (Aquasil regular set, Dentsply Caulk) in a special tray along with framework. Care was taken to block the undercuts below the bar with the soft wax bat the time of impression making. A female component was fabricated as a metal sleeve to snugly fit over the bar. This sleeve was perforated to allow for the retention of the same for the intaglio surface of the denture. This sleeve was embedded in the tissue surface of the denture later. A record base was fabricated with relief block-out. A record rim was made, and the jaw relationship recorded and transferred onto a semi-ad justable articulator.

Teeth arrangement was done. During try-in, patient's approval was taken, and the trial denture was finally processed. Relief was provided around the bar framework area so that no movement of the framework occurred as the denture base was moved slightly on and off the tissue. Pressure indicating paste was used for this purpose to check unwanted contacts. Finally,

the denture was placed [Figure 5]. It had a passive fit with the simultaneous accurate fit of the metal denture base on the mucosa, and the bar supported abutments. A postoperative radiograph was taken after 1 year to evaluate the abutments. They were found to be satisfactory.

Special precautions need to be taken for care of over dentures. Topical use of fluoride agents such as Stannous fluoride, sodium fluoride and stannous fluoride gel reduces the caries to occur. Frequent recalls help in the monitoring of over denture's success.

Figure 1 mandibular teeth present 37,38 and 48

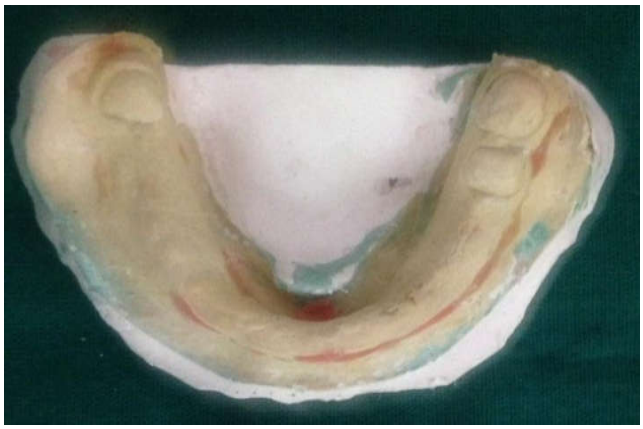

Figure 2 cast poured in die stone after tooth preparation

Figure 3 wax pattern for the bar framework

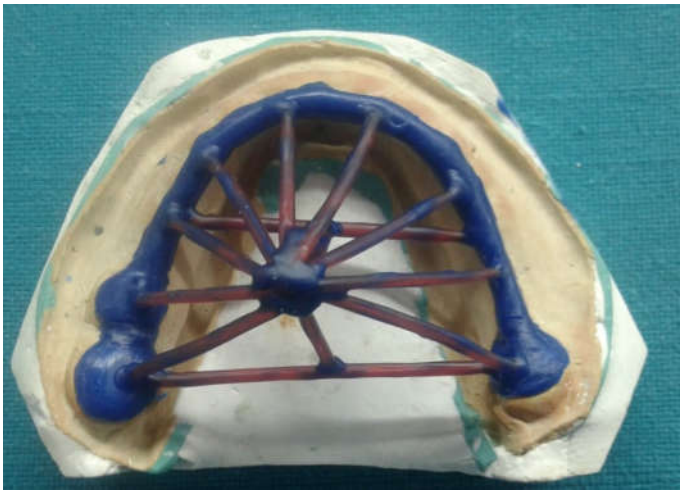

Figure 4 Investment of wax pattern

Figure 5 Final denture placement

DISCUSSION

The prospect of losing all his teeth can be very disturbing for a patient. It also brings down patient's morale as it is an indirect reminder for being dependent on others and losing senescence.

In such conditions, over denture option as preventive prosthodontic treatment modality should be regularly imbibed in our dental practices because of its innumerable advantages Crum and Roone [5] graphically demonstrated in a 5 years study an average loss of 0.6 mm of vertical bone in the anterior part of the mandible of over denture patients through cephalometric radiographs as opposed to 5.2 mm loss in complete denture patients.

For this case, there was sufficient inter-arch space, so the use of the customized bar joint with snugly fitting metal sleeve offers increased stability and retention. It has been proved that reducing abutment to 1.5-2 mm above gingival margin reduces the crown-root ratio and thus reducing mobility by 40%.[6] As the bar is close to the alveolar bone, forces of mastication exert much less leverage to the teeth. The bar joint offers slight vertical and rotational movement of the denture as well as a stress breaker action. Bar exhibits more cross-arch involvement and allows occlusal forces to be shared between the abutments. [7] Since there was adequate inter arch space, so the thickness of the acrylic denture over the copings and bar assembly was not compromised. Customized Bar assembly calls for perfection both at the dentist and technician level, so it is challenging to execute, but the results are worth the effort.

In cases with limited inter arch space, reinforcement of the denture base with metal framework adjacent to the top of the coping would be effective in reducing overdenture fracture due to reduced thickness of acrylic resin because of the bulkiness of the bar assembly. [8] Thus stress was reduced in the midline of the overdenture and around the copings, functional rigidity was improved. Occlusal stress to the underlying denture-bearing areas was distributed evenly.

These days implant treatment has become the norm, thus tooth supported over dentures have taken a backseat as a result of competitive (belligerent) commercialization of implants. [9]The success of the tooth-supported over denture treatment depends upon the proper attachment selection for the particular case. Various factors for attachment selection include available buccolingual and inter arch space, the amount of bone support, opposing dentition, clinical experience, personal preferences, maintenance problems, cost and most important being patient's motivation. Careful selection of the strategic abutment is important. The decision must first be made to retain the teeth as over denture abutments and then the attachments should be planned. The attitude of the patient to the treatment should be assessed. Only those who understand the limitations and benefits of attachments should be treated with attachment retained over dentures. Hence, patient selection is critical to the success of the treatment.

A tooth supported over denture is very much at the forefront as the treatment modality incorporating Preventive Prosthodontics concepts to the core. Let's not forget our basics rather reinvigorate them and make them a regular part of our clinical practice.

Conflict of Interest- There are no conflicts of interest.

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