

CASE REPORT

Mandibular Bar Attachment Retained Overdenture for Divergent Root Canals

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ABSTRACT

There are many bar attachments available for use today. The purpose of the bar attachment is splinting of the abutment teeth and retention, support of the prosthetic appliance. The bar retained overdenture fabricated without the custom-cast posts lacks retention; so to enhance the retention of the bar attachment, the custom cast posts are incorporated along with the copings of the bar. In most cases as root canals are divergent, the bar along with the posts cannot be made in the single casting because path of insertion and path of withdrawal is not possible. This clinical report describes a simple technique of fabrication of bar attachment retained over denture with custom cast posts for divergent root canals.

Keywords: Bar attachments, Overlay/overdentures, Crown and sleeve prosthesis, Divergent root canals.

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INTRODUCTION

It is a challenge to prosthodontist to rehabilitate the patient with few teeth remaining. The treatment plan should delay or eliminate future prosthodontic problems.¹ Complete denture patients are generally unsatisfied due to instability of the denture during functional and parafunctional movements.² It is difficult to obtain retention and stability for lower complete denture in patients with extensive alveolar resorption. Keeping Devan's dictum in mind, smaller the number of mandibular teeth that retained, the more carefully these teeth should be treated. It is imperative to preserve them when only two teeth remain. The bar attachment

denture preserves a small number of residual teeth as long as possible. The bar splints the shortened and crowned abutment teeth, retains and partially supports the complete denture and together with the sleeve contained in the denture base acts as a joint.³ Retention and stability of over dentures can be enhanced by attachments classified as studs and bars which can be rigid or resilient.⁴

CASE REPORT

A 55-year-old male patient reported to the department of Prosthetic dentistry of St. Joseph Dental College, Duggirala, Eluru for prosthetic rehabilitation of maxillary edentulous and mandibular partially edentulous ridges. His medical history was not significant. On intraoral examination, he had two mandibular cuspids 33, 43 (Figs 1A and B). On clinical examination, vertical dimension showed sufficient inter occlusal space to accommodate bar attachment mandibular over denture. Treatment plan included endodontic therapy for the retained teeth and fabrication conventional maxillary complete denture and bar attachment retained mandibular over denture by incorporating custom cast posts.

Technique⁵

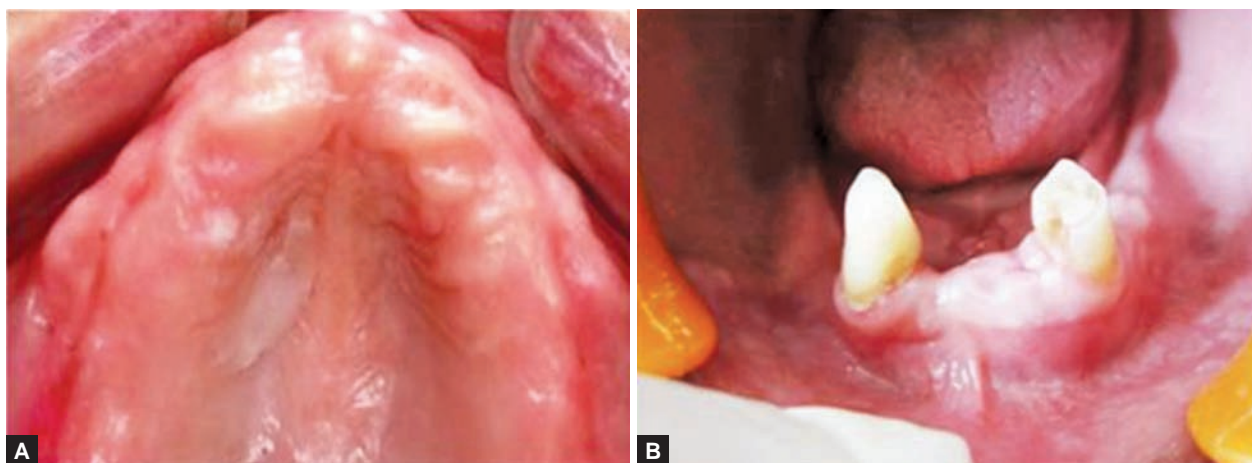
1. After abutment teeth and post space preparations, impressions were made with additional silicone (Aquasil LV, Dentsply, Caulk, Germany) for indirect impression technique. Prefabricated bar pattern made with plastic was customized and attached to the waxed up copings along with post on right side (tooth 43) and cast as the first substructure (Figs 2A and B).
2. After the casting of the 1st substructure it was fitted on the cast and created the diaphragm on left side (tooth 33) (Figs 3A and B) and the second post pattern was made by extending 2 mm around the diaphragm and cast so that it would pass through an aperture in the diaphragm (Figs 4A and B).
3. The whole substructure was tried in the patient's mouth. The first section of metal substructure was cemented followed by the individual post with resin cement (3M ESPE relyXTM U100 Self-Adhesive Universal Resin Cement), locking the whole substructure in place (Figs 5A and B).

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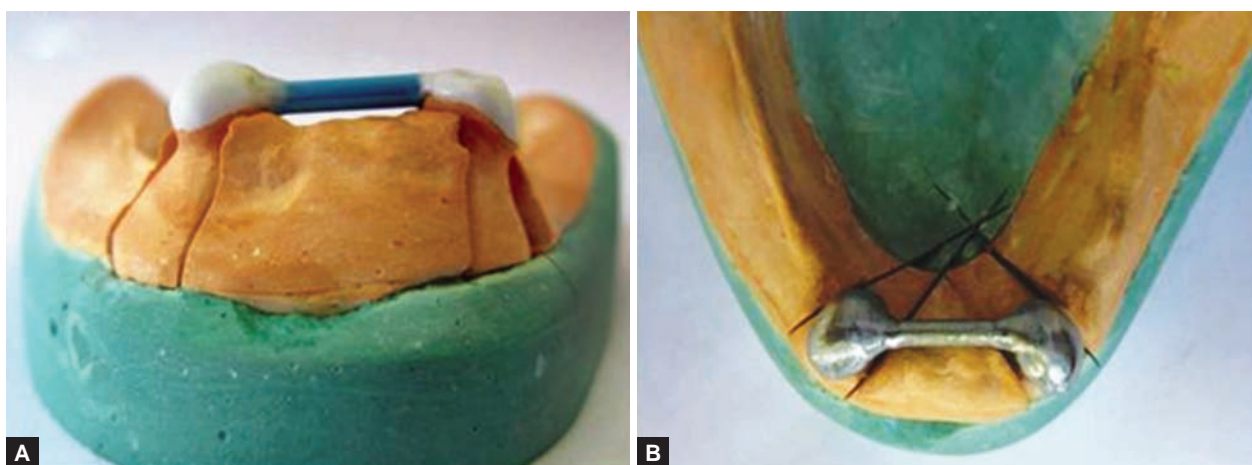
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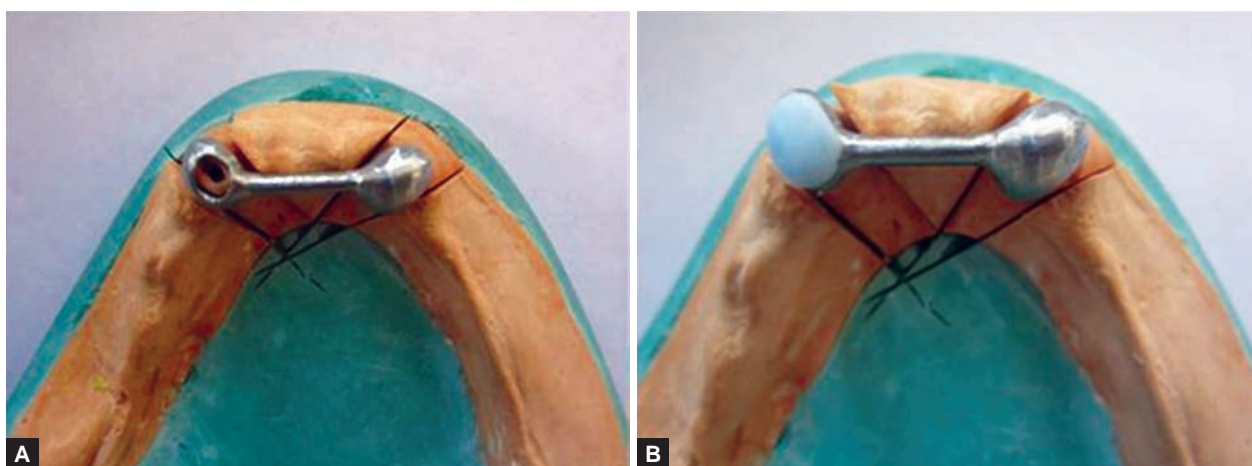
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Figs 1A and B: Preoperative view: (A) maxillary ridge and (B) mandibular ridge



Figs 2A and B: (A) Preformed plastic bar pattern attached to copings and (B) first substructure fitted on the cast

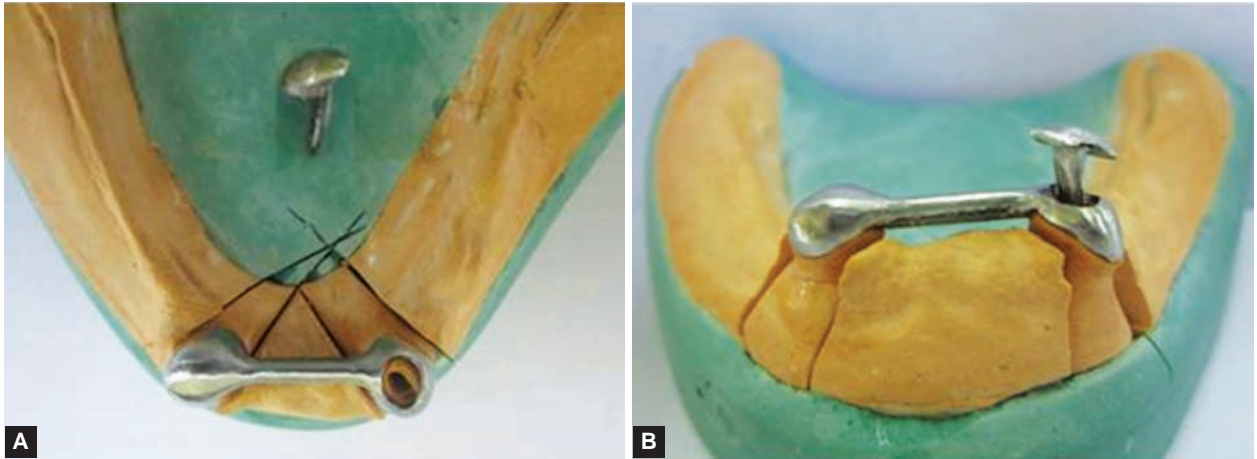


Figs 3A and B: (A) As two roots of the canines had a conflicting path of withdrawal, an aperture through 33 to allow a separate post to be placed and (B) individual postpattern fabricated through aperture

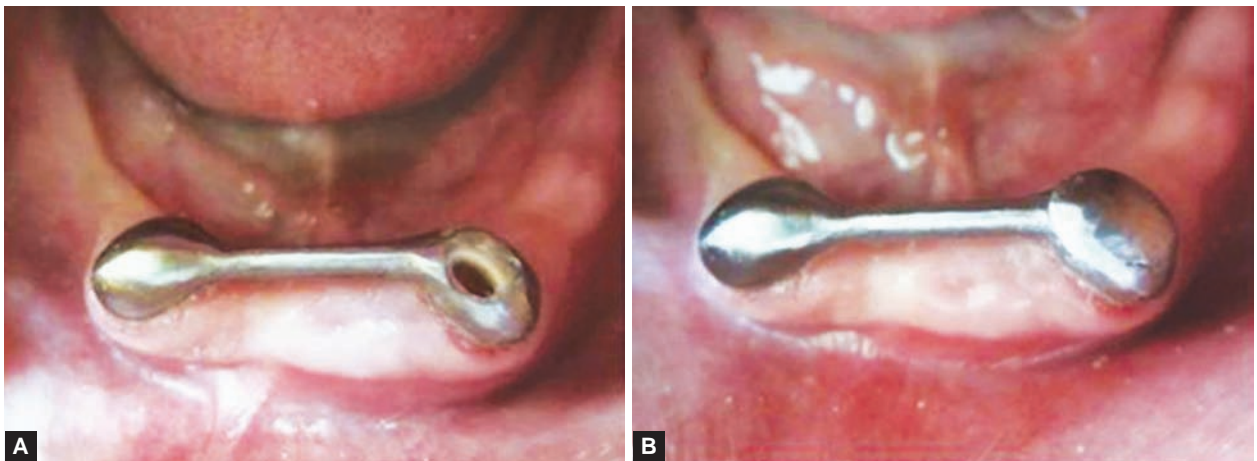
4. After border molding, secondary impression and maxillomandibular relation, try-in was done and denture delivered by incorporating the sleeve which engages precisely positioned depressions on the bar (Figs 6A and B).
5. Post insertion instructions were given and the patient was recalled for post insertion check-up subsequently to evaluate the abutments and periodontal tissues.

DISCUSSION

The overdenture is an outstanding mode of treatment. The teeth that are used for retention and support are of critical importance for the maintenance of health. A breakdown in their structure or periodontal support immediately negates an overdenture concept so, we must control factors that jeopardize success like periodontal



Figs 4A and B: (A) The postconstructed to pass through the diaphragm on 33 and (B) the postpassing through the diaphragm



Figs 5A and B: (A) The first section of metal substructure was cemented and (B) followed by individual post



Figs 6A and B: (A) A view of fitting surface of the mandibular denture showing sleeve which engages the precisely positioned depressions on the bar and (B) the completed prosthesis

disease by periodontal therapy and proper homecare.⁶ In anterior teeth, canines are the important proprioceptive organs, their shape, strategic position and the larger periodontal attachment area make them ideal abutments.¹ When teeth are treated endodontically and used as abutments periodontal fibers transmit the occlusal forces as tensile stresses to the underlying bone, which are conducive to bone repair and delays resorption of

alveolar bone.⁷ Attachment retained over denture could be a better option in patients with few remaining teeth that are not ideally located to support fixed and removable partial denture. Other treatment option in this case could be stud attachment retained over denture but it allows independent movement. If one tooth is especially weak the strong tooth can act as a fulcrum point for movement of the weaker tooth in the prosthesis but in



Figs 7A and B: (A and B) Pre and postoperative profile view

bar joint retained overdenture, the bar often splints in more than one plane. Under a functional load with bar fixation, all or none move instead of prosthesis moving one tooth.⁸ The technique discussed in this clinical report overcomes certain significant problems viz. the bar attachment overdenture fabricated without posts lacks retention and also frequent detachment of bar unit occurs during denture removal and if bar unit is fabricated as a single substructure along with posts the path of insertion and path of withdrawal is not possible as root canals are divergent. Even though if it possible in some cases, it requires more tooth and root preparation which leads to weakening of tooth structure and makes it prone to root fracture during masticatory loads. Simplicity in design, ease in maintenance and minimum leverage make rhens bar attachments are used in this case. At follow-up patient was satisfactory with the dentures (Figs 7A and B).

SUMMARY

Preservation of teeth and bone maintains patient's physiological dimension. Thorough diagnosis, establishment of

the path of insertion and withdrawal and proper positioning of the attachments are critical to the success of the prosthesis. If the patient is properly motivated regarding oral hygiene maintenance bar attachment retained overdenture provide better treatment modality in preventive prosthodontics for edentulous patient.

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