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TOOTH SUPPORTED BAR OVERDENTURE-A CASE REPORT

Dr. Gaurang Mistry
Dean & HOD, Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Navi Mumbai.
Dr. Mayuri Bachhav
Associate Professor, Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Navi Mumbai.
Dr. Amit Pokharkar
Lecturer, Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Navi Mumbai.
Dr. Simral Mathews
Postgraduate Student, Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Navi Mumbai.
Dr. Ashmita Chabria
Postgraduate Student, Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Navi Mumbai.
Dr. Vidhi Karia
Postgraduate Student, Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Navi Mumbai.

ABSTRACT:
The case report shows the benefits of overdenture therapy which preserves the residual ridge and preserves the sense of proprioception. It also helps in maintaining good border seal and helps in speech as well as improves chewing efficiency. The retention and stability of these prosthesis is greatly enhanced. This case report depicts the step-by-step procedure for a mandibular tooth supported bar overdenture and removable partial denture in the maxillary arch. The bar was fabricated from castable bar system and a direct pickup was done. The mode of retention is primarily through frictional resistance.
Keywords- bar, mandible, tooth supported, attachment, overdenture

INTRODUCTION:

DeVan said “Perpetual preservation of what remains is more important than the meticulous replacement of what is missing”. It is important to preserve what is already present, hence, preserving teeth is of utmost importance. Teeth are most commonly lost due to trauma, caries or periodontal disease. (1) Treatment options when there are some remaining natural teeth are implants, conventional fixed prosthesis or tooth or tissue supported dentures. (2)
Implants are often expensive and depending on the quality of bone may or may not require bone grafting. Dentures often are less satisfactory for patients due to lack of retention or soft tissue coverage. In some cases, there are not enough abutments to support a fixed prosthesis. Thus, tooth supported bar overdentures help to overcome these challenges and is thus, an excellent alternative. (3)

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According to GPT, an overdenture is any removable dental prosthesis that covers or rests on one or more remaining natural teeth, the roots of natural teeth and or dental implants (GPT 8). (4)

Fabricating a prosthesis with utmost retention and stability is the goal of every Prosthodontist. It becomes even more challenging when the ridges are severely resorbed and do not help in retention and stability. Preventive Prosthodontics is now a current trend that is being widely accepted all around the world. It not only helps in preserving natural teeth but also the bone and also proprioception. (5)

Overdenture therapy is a part of preventive prosthodontics which is a widely successful treatment option. Certain attachments increase the retention of these prosthesis. They can either be extra radicular or interradicular. These attachments help in redirecting the occlusal forces on weak abutment teeth and redistribute these forces away from the soft tissues and to stronger abutments. (6)

They also play a role in shock absorption, stress redirection as well as superior retention. The attachments used to retain the prosthesis could either be studs or bars. The bar attachments not only help in retention but also act as splints for root spanning the edentulous space. Since the bar is closer to the mandibular alveolar bone, less torquing forces will be applied as compared to the occlusal rest of a mandibular partial denture. (6)

The overdenture attachments can also be classified as resilient and rigid. Resilient attachment use is more common in overdenture therapy because periodontal support is needed for these teeth. It distributes the forces over both the retained natural root as well as the edentulous ridge. (7)

This case report describes a tooth supported Hader bar metal superstructure attached to the mandibular denture by direct technique. The design incorporates the use of plastic retention clips inside the metal superstructure. This gives an added advantage of plastic clip removal and replacement with a new sleeve after wear of the original sleeve.

CASE REPORT:

A 72-year-old male patient reported to the Department of Prosthodontics, Crown and Bridge, D.Y. Patil University, School of Dentistry, Navi Mumbai with a chief complaint of replacement of missing teeth and difficulty in eating.

Intraoral examination revealed 26 and 27 missing in the upper arch and lower

35, 36, 43 and 44 were present. No mobility of the teeth was seen and all the remaining mandibular teeth were root canal treated. The ridge was favourable and was firmly attached. Radiographic examination of the teeth revealed that all the teeth present sufficient bone support. (Figure 1)

All the possible treatment plans were discussed with the patient including implants, fixed partial dentures and conventional removable prosthesis. The patient wanted to preserve his remaining teeth. All the factors involved were studied and the treatment planned for him was upper removable partial denture and lower tooth supported overdenture using bar attachments.

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Diagnostic impressions were made with irreversible hydrocolloid impression material (Zhermack Tropicalgin). Diagnostic casts were poured in Type III Gypsum (Kalabhai Kalrock). A diagnostic jaw relation was done to determine the vertical dimension as as well as occlusal plane. The vertical dimension was 16mm, which was found satisfactory for tooth supported bar overdenture. The patient also had good neuromuscular control.
The mandibular teeth were prepared to receive the copings with the bar. Heavy chamfer finish line was prepared which resulted in adequate crown root ratio and optimal clearance for the prosthesis. (Figure 2) This was followed by border moulding using low fusing impression compound (DPI Pinnacle Tracing Sticks) and final impression using light body wash (Zhermack Zetaplus) . (Figure 3)
An inlay wax(GC Inlay Wax Soft) pattern coping was fabricated on the prepared mandibular teeth.The copings were connected with a prefabricated plastic bar of 2mm thickness and 3mm height. The wax pattern was cast in Ni-Cr alloy using the standard technique. The casting was retrieved, finished and polished to prevent plaque accumulation from occurring. (Fig.4)

The metal bar with the copings were tried intraorally to check for passive fit. They were cemented using glass ionomer cement (GC Gold Label Glass Ionomer Luting and Lining Cement) (Fig.5)
Maxillomandibular relation was recorded. This was done using occlusal rims on temporary denture bases that were fabricated on the maxillary cast and mandibular metal framework. (Fig.6)
Try in was carried out after teeth arrangement was completed and evaluation of phonetics, occlusion and esthetics was carried out. (Fig. 7)
Fabrication of the dentures was carried out. Polishing of the prosthesis was then done and occlusion was assessed and evaluated.

After the try-in, the under surface of the bar was blocked with beading wax(MAARC Beading Wax) on the mid surface of the bar and the plastic positioner clips were placed for pick up in the denture directly(intraorally) using auto polymerizing resin.(DPI Cold Cure) (Fig.8,9)

Post placement instructions were given and recall of the patient was carried out the next day, after 7 days and after a month. The patient was pleased with the esthetics, phonetics and could chew efficiently. Recall is to be carried out every six months for assessment. (Fig 10,11)

DISCUSSION:

The overdenture therapy is a successful preventive prosthodontic treatment option as it endeavours to preserve the remaining natural teeth as well as their associated supporting structures. In 1916, Prothero stated that “Oftentimes two or three widely separated roots or teeth can be utilized for supporting a denture”. Thus, the teeth unsuitable to be used as

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abutments can be rendered suitable after modification to be used as overdenture abutments. (8)

Residual ridge resorption is an inevitable pathophysiologic phenomenon. The mandibular ridge resorbs faster than the maxillary ridge according to previously reported literature. It has been proven that bone and supporting structures around the preserved teeth/roots are maintained for a longer duration of time and thus, result in increased stability and retention of the denture. (9)

Retention and stability of the prosthesis is dependent on the quantity and location of the abutments.

Further increase in retention can be achieved using attachments. Sufficient vertical space is required for overdentures especially with attachments. There must be sufficient interocclusal space for roots, copings, attachments, with adequate thickness of denture base material and teeth without jeopardizing the strength of the denture. (10)

The use of the abutments splinted together with the bar is more advantageous than using individual abutments. The splinting effect of the bar makes the abutments stronger as well as redirects the forces away from the soft tissues. It also reduces the torquing forces on the remaining root structure due to the decrease in crown root ratio.(11)

Two methods are available for clip insertion-direct and indirect technique. The direct technique which is done intraorally is the most widely used technique. The indirect technique is laboratory fabricated and is used lesser due to the the extra steps required. (11)

The disadvantages of overdenture are that it requires meticulous oral hygiene in order to prevent caries and periodontal disease. The prosthesis are usually bulky. The treatment procedure is often expensive with frequent recalls. Encroachment of the interocclusal space could occur.(11)

In overdenture treatment an adequate width of attached gingiva is necessary. It is contraindicated in patients with poor oral hygiene, systemic complications and inadequate inter-arch distance.(11)

FIGURE 1 PRE-OPERATIVE EXTRA-ORAL

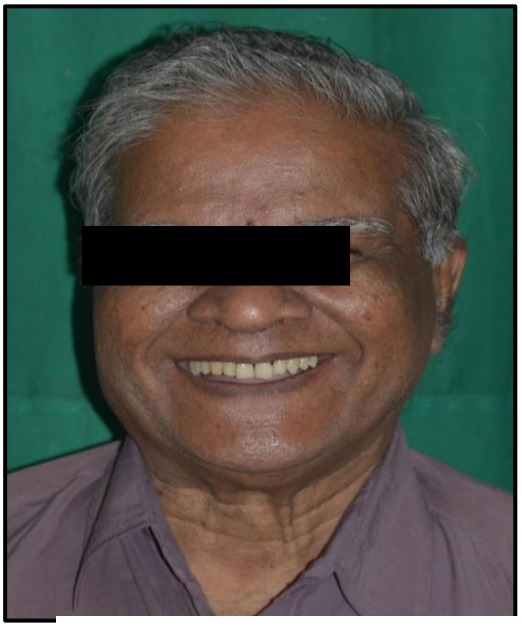

FIGURE 1

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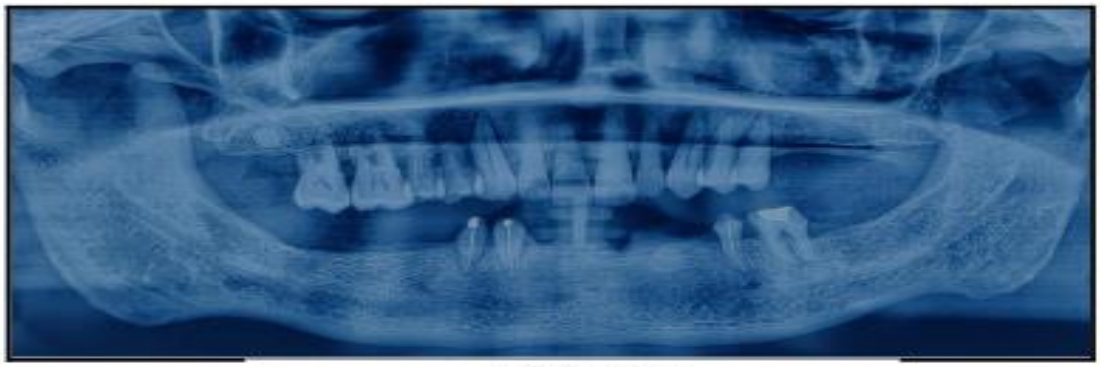

FIGURE 1

PRE-OPERATIVE OPG

FIG.5

BAR FRAMEWORK TRIAL

FIGURE 2 TOOTH PREPARATION FOR COPING WITH BAR FRAMEWORK

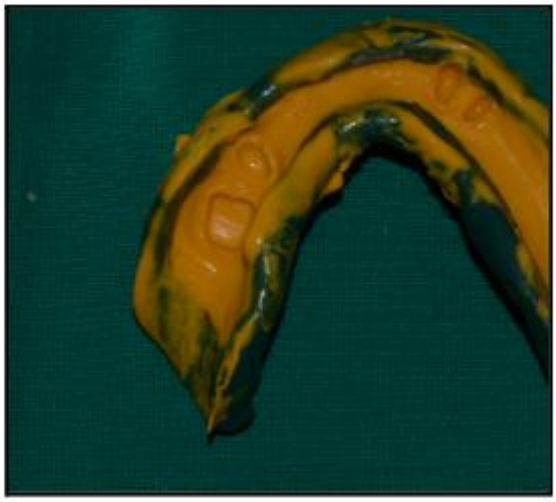

FIGURE 3

FINAL IMPRSSION

FIG.4

COPINGS WITH BAR FRAMEWORK

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FIG.5

BAR FRAMEWORK TRIAL

FIG.6

JAW RELATION

FIG.7

TEETH SETTING TRIAL – FRONTAL VIEW

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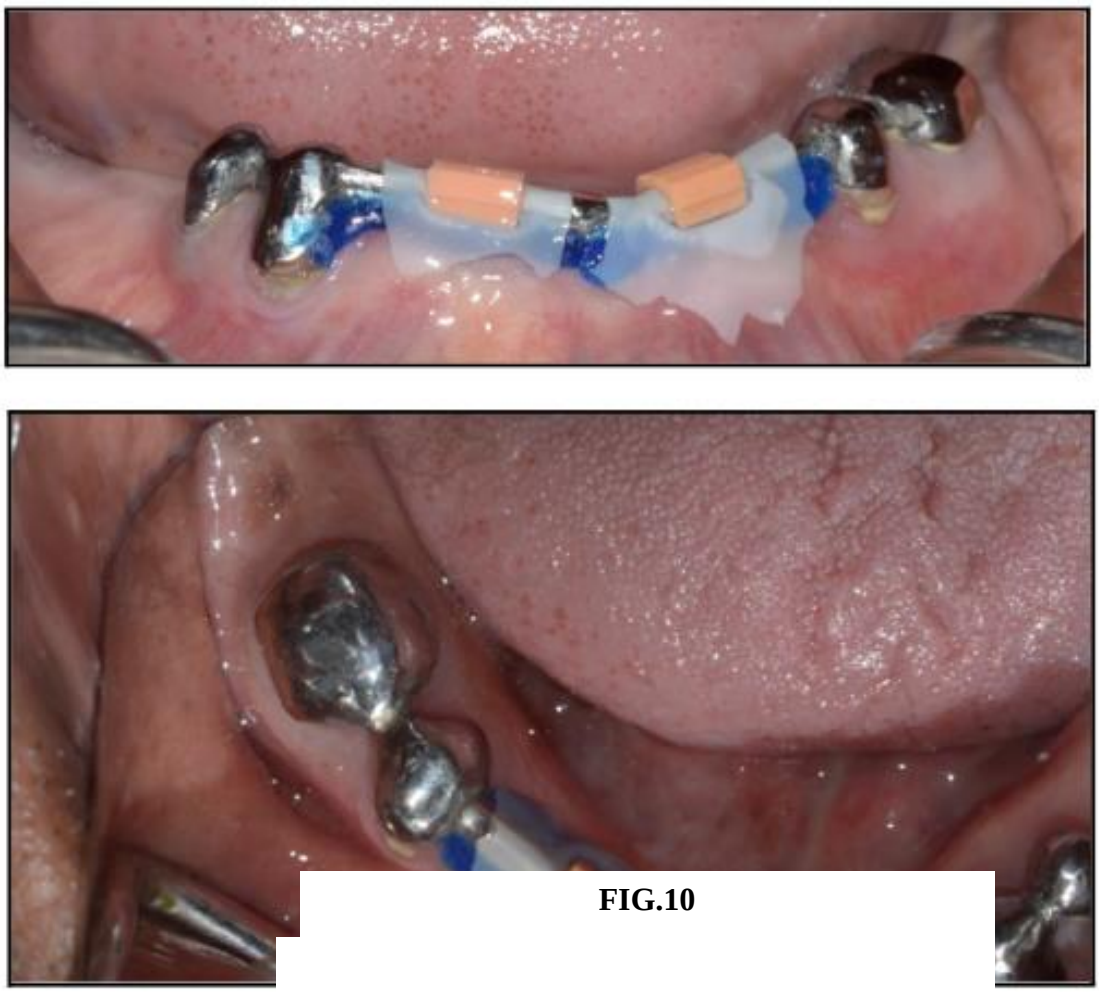

FIG.10

FINAL DENTURE IN OCCLUSION –
FRONTAL VIEW

B|

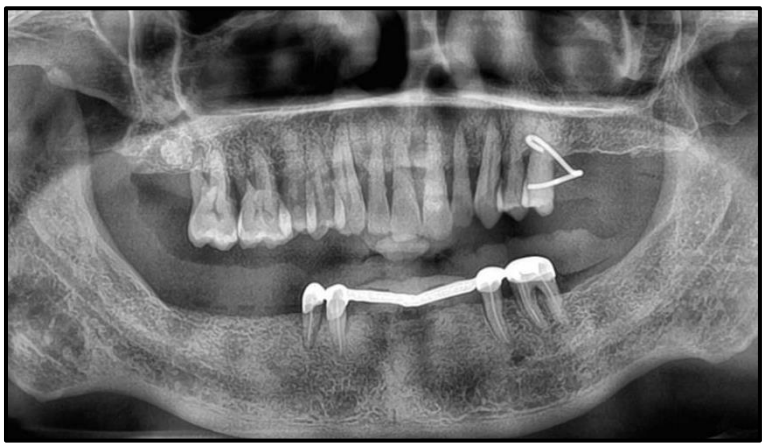

FIG 11

POST-OPERATIVE OPG

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FIG.9

INTAGLIO SURFACE OF MANDIBULAR
OVER-DENTURE WITH PICK-UP SLEEVES

FIG.10

FINAL DENTURE IN OCCLUSION –
FRONTAL VIEW

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FIG 11

POST-OPERATIVE OPG

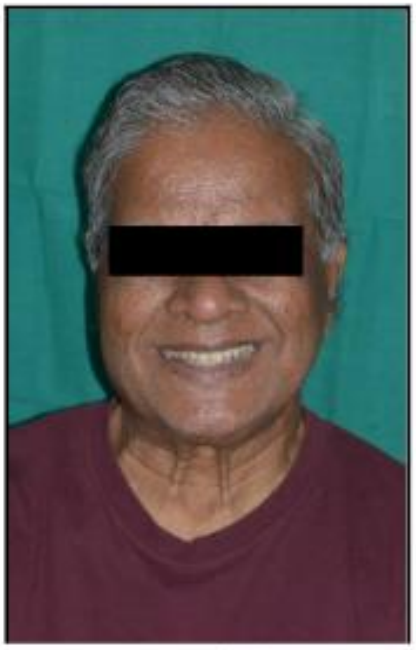

FIG 11

POST-OPERATIVE EXTRA-ORAL FRONTAL VIEW

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