

# COPING AND BAR RETAINED TOOTH SUPPORTED OVER DENTURE A VIABLE OPTION TO PRESERVE THE PROPRIOCEPTION AND RESIDUAL BONE- CASE REPORT

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## ABSTRACT

Prosthetic treatment with overdenture is a favoured treatment modality for elderly patients with few remaining teeth and roots that are maintained under the denture base to preserve the residual ridge. The tooth supported overdenture provides the patient with a greater stability of the denture and improved masticatory function and esthetics. Retaining natural teeth as abutments for dentures can considerably reduce the progress of residual ridge resorption. Multiple abutments can be used to retain proprioception and prevent further bone resorption. This clinical report describes two cases that were successfully rehabilitated with tooth supported overdentures with high retention and esthetics.

**KEYWORDS :** Coping and Bar Retained Tooth-Supported Over Denture, Residual Bone, Proprioception

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## INTRODUCTION:

In the past, extraction of the entire dentition followed by complete denture replacement used to be promoted as an inexpensive and permanent solution for oral health care. The treatment with overdenture was accepted in the 1960's, when a new clinical procedure in the fields of periodontology and endodontics was used. We can think of no other better example of preventive dentistry than the use of an overdenture.<sup>1-4</sup>

According to DeVan's golden statement: "Perpetual preservation of what remains is more important than the meticulous replacement". Complete edentulism deals with complete denture planning.<sup>5</sup> However, the complete denture patient goes through a sequel of events like loss of discrete tooth proprioception, progressive loss of alveolar bone, transfer of all occlusal forces from the teeth to the oral mucosa, and the most depressing sequel, the loss of self-confidence.<sup>6</sup>

Overdenture is a dental prosthesis that covers and also is partially supported by natural teeth, natural teeth roots, or dental implants. Tooth-supported overdentures have various advantages over conventional complete dentures like preservation of alveolar bone, preservation of periodontal proprioception, improved retention, stability and support, enhanced psychological comfort, and increased masticatory efficiency.<sup>7</sup> But the tooth supported over denture has few disadvantages like secondary caries on the abutment tooth, need endodontic treatment in certain clinical condition, sometimes need metal denture base to prevent fracture at the abutment site, need additional designing and laboratory work and expensive.<sup>7</sup>

According to **Glossary of Prosthodontic Terms (GPT 9)**, "Overdenture is a removable partial or complete denture that covers and rests on one or more remaining natural teeth, roots, and/or dental

implants; a dental prosthesis that covers and is partially supported by natural teeth, tooth roots, and/or dental implants. It is also called as overlay denture, overlay prosthesis and superimposed prosthesis".<sup>8</sup>

Rehabilitation of the partially edentulous area with tooth supported over denture gives comfort, more retention and psychological support to them. Hence this technique was applied for two cases for rehabilitation of partially edentulous spaces with coping and bar retained over dentures.

## CASE 1:

A 69 year old male patient reported to our Department of Prosthodontics with a complaint of missing teeth in the upper jaw and lower back tooth region for the past 7 years. Extra-oral examination revealed unsupported lip and cheek musculature, mild distortion of speech articulation and no loss in vertical dimension. Intra-oral examination revealed that the teeth 24 and 25 alone were present in maxillary arch while 35, 36, 37, and 46 were present in the mandibular arch with gingival recession in 45. Also, root canal treatment was performed on 45 (Fig.1). The various treatment options available for this patient's maxillary arch were conventional complete denture, implant supported overdenture and tooth supported overdenture. The patient was not willing for extraction of his remaining natural teeth and wished to use tooth supported complete dentures, and hence, the treatment was started after obtaining an informed consent.

## CLINICAL PROCEDURE:

Orthopantomogram of the patient was taken to evaluate for the presence of any pathologies. (Fig.3). Root canal treatment (RCT) was performed on 24 and 25 teeth, and subsequent to which, an impression of the maxillary and mandibular arches were made with Zelgan Plus alginate impression material (Dentsply, International, INC., New York,

USA). The impression was then poured with dental stone (Fig.2). The teeth preparation was done on 24 and 25 (Fig.4) and metal coping was fabricated through conventional casting method and luted with glass-ionomer cement (GC Corporation, Tokyo, Japan) (Fig.5). The final impression was then made with poly vinyl siloxane impression material (Aquasil, Dentsply Intl, New York, PA) (Fig.6) and poured using dental stone (Fig.7). The stabilized record bases were made using autopolymerized PMMA resin (DPI, India) using sprinkle-on technique and occlusal rims were fabricated with modelling wax and then, jaw relations were recorded. Teeth arrangement (Premadent, Delhi, India) was done in conventional manner (Fig.8) after which, wax try-in was done in the patient's mouth. After the laboratory procedure of processing the dentures, the overdenture was placed intra-orally and routine postinsertion instructions were given and the patient was motivated to make an effort to learn to adapt to the new dentures (Fig 9 & 10). During the follow-up after a week, the patient expressed satisfaction in mastication and phonetics.

## CASE 2

A female patient of age 57 years, reported to the Department of Prosthodontics, SRM Dental College and Hospital with a broken lower denture at the left side canine area. Her major desire was to improve her masticatory function while retaining remaining natural teeth. Extra oral examination revealed no loss of vertical dimension, unsupported lip and cheek musculature, and mild distortion of speech articulation. Intraoral examination revealed that the maxillary missing teeth were replaced with a fixed partial denture in relation to 11,12,21,22,23 and a flexible removable partial denture in relation to 14,15,16,17,25,26,27. The mandibular metal copings were missing and the denture thickness was inadequate. The patient was presented with different treatment options available which included complete dentures, removable partial dentures,

and implant supported fixed partial dentures. The patient was hesitant to undergo dental implants due to the need for an additional surgery and extended treatment duration as well as an increase in cost of the procedure. Therefore, an effective treatment plan was made to use a bar retained over denture to prevent fracture of the denture.

## CLINICAL PROCEDURE:

A custom tray was fabricated using autopolymerized PMMA resin (DPI, India) and border-molding done with low-fusing modelling plastic. (DPI, India) The final impressions were made with polyvinyl siloxane putty and light body impression material (Aquasil, Dentsply Intl, New York, PA) (Fig 11). Master casts were poured with type-III dental stone. The bar was obtained after investing and casting in conventional manner (Fig.12) and try in was done to check the fit of the metal framework. (Fig.12). Occlusal rims were fabricated with modeling wax, jaw relations were registered, and teeth arrangement (Premadent, Delhi, India) was done in an articulator. Try-in was done in the patient's mouth (Fig.13). Final finishing, polishing, laboratory remounting was done (Fig.14) and after the necessary adjustments, the denture was inserted. (Fig 15 and 16). The post insertion was reviewed and the patient was completely satisfied ( Fig 17).



Fig 1 : Pre-operative intra oral view

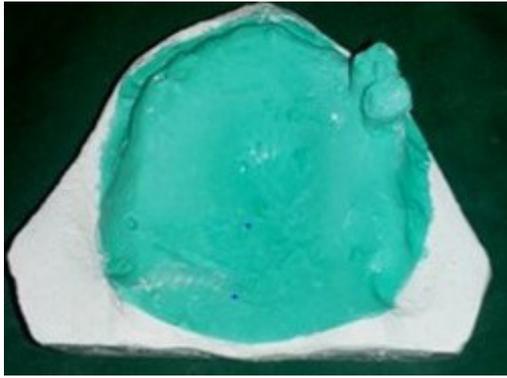


Fig 2 : Diagnostic cast

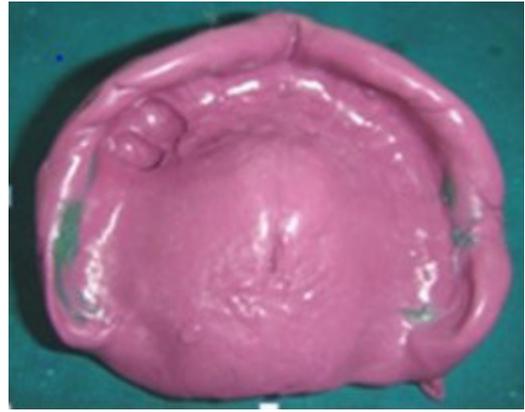


Fig 6 : Final impression with silicone material



Fig 3 : Orthopantograph



Fig 7 : Master cast



Fig 4 : Prepared Tooth



Fig 5 : Coping luted intra-orally



Fig 8 : Teeth arrangement



Fig 9 : Denture placement



Fig 10 : Post-operative extra oral view



Fig 11 : Final impression with silicone material



Fig 12 : Laboratory frame work



Fig 13 : Metal try-in



Fig 14 : Wax-try in



Fig 15 : Finished complete denture (Intaglio surface)



Fig 16 : Denture placement



Fig 17 : Extra-oral view

## DISCUSSION:

For elderly people with partially or completely edentulous arches, different treatment options can be provided. Acrylic complete dentures, teeth-supported and implant-supported overlay dentures are popular therapies. Maintaining the teeth that are protected by these overlay denture abutments offer efficient restorative<sup>9</sup> solutions of natural dentition as overdenture abutments (overlay denture) have become an effective substitute for the removal of residual dentition over the past few years.<sup>10</sup> Denture retention which is assured by overdenture is important to increase the quality of patient's life as related to oral health.<sup>11</sup>

The remaining roots of the teeth, which are not extracted and left in place, significantly reduce bone loss. Retained teeth (roots) should preferably be on both quadrants in the jaw. However, removal

of the portion of the teeth above the gingival margin is required. Hence, most of the tooth crown is removed to improve the crown-root ratio. This often necessitates root canal therapy.

## CONCLUSION:

Overdenture therapy presents a realistic alternative to the patients who are not willing to extract their remaining natural teeth. The technical simplicity, the usefulness for geriatric patients, the increased control of jaw function through the maintained periodontal ligaments and psychological benefits are the advantages of an overdenture. Neuromuscular mechanism, the articulation of temporomandibular joint and the denture's supporting structures are biologically maintained in a much better way by teeth than by the mucoperiosteum. Tooth supported overdenture is psychologically beneficial as the patient does not need to undergo extraction.

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