

# CASE REPORT

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## COST EFFECTIVE PRE-FABRICATED SEMI-PRECISION ATTACHED OVERDENTURE - A CASE REPORT

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**ABSTRACT:** Considering the newer advances in the field of prosthodontics the use of implant has become popular. However not every patient can go for such procedures considering the economic norms and lack of awareness as well. A conventional concept of preventive prosthodontics has been emphasizing on the importance of any procedures that can delay or eliminate future prosthodontic problems. In a recent study, post insertion of denture, most patients with removable partial or complete dentures were dissatisfied with their retention and stability. Considering this overall scenario when a patient with completely edentulous maxillary arch and partially edentulous mandibular arch reported to the mentioned institution, a semi-precision attached overdenture were thought of, which in turn could show considerable advantages like increased retention, proprioception, and masticatory efficacy. A Prosthodontist who is well acquainted with semi-precision attachment will be in position to suggest a better treatment options in retaining teeth which might otherwise be considered for extraction or immediate implant placement.

**KEY WORDS:** attachment, overdenture, pre-fabricated, semi-precision, tooth-supported

**INTRODUCTION:** A primary reason for dental treatment is to restore oral function especially mastication, bite force shows positive relationship with masticatory performance and dietary selection. Most common debilitating oral condition existing on a routine level is edentulism, especially in mandible.<sup>1</sup> Earlier when the patient used to come as candidates for denture with their weak worn-out teeth, were advised for total extraction and followed by replacement with conventional complete dentures.

However, it remains one of the more challenging procedures in the dental practice to fabricate a complete mandibular denture offering patient comfort, function and esthetic harmony with retention and stability.<sup>2</sup> "Its more important to preserve what already exists than to replace what is missing" as stated by MM De Van has never been questioned or disagreed. Considering this the preservation of one or more teeth/roots to facilitate an overdenture has many advantages, including preservation of alveolar bone overtime.<sup>3</sup> Other advantages like increased stability and efficiency of function and maintenance of proprioception are of great benefit to the patients.<sup>4</sup>

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For overdentures a lot of auxiliary retentive attachments to anchor prosthesis and increase or provide retention have been promoted. However the most common and simplest being the retention offered mechanically by the means of O-ring and a ball. This comprises mainly of a root supported component (usually metallic) and a corresponding component (usually nylon, plastic or rubber) luted into the intaglio of the prosthesis.<sup>5</sup>

To use the commercially available precision attachment is a costlier affair when practicing in rural setup. So we came up with the concept of fabricating semi-precision attachments. The attachments were fabricated using the conventional lost wax technique for casting. The intra radicular portion was made using the pattern resin while, the coronal portion was made using the plastic bead and pattern resin. These two halves were joint using the pattern resin forming one single unit. This was invested and casted conventionally. These attachments were fabricated in the institute itself and later were used in the patient. This not only served the purposed but also reduced the patients visit and the cost of the treatment. This case report explores the treatment of a patient with prefabricated semi-precision retained overdenture.

**CASE REPORT:** Patient reported to the Department of prosthodontics with a chief complaint of difficulty in mastication. On examination maxillary arch was completely edentulous. The mandibular arch was partially edentulous and was Kennedy class I modification 1. The teeth present were 34,35 and 44,45 (figure.1). The teeth present were periodontally sound. The patient was dissatisfied by the previous ill fitting removable partial dentures. The patient was informed with all the possible treatment options from fixed implant treatment to conventional complete dentures. After a careful consideration the treatment mutually agreed was to have a overdenture with semi-precision attachments. An informed consent was then obtained from the patient.

**PROCEDURE:** Diagnostic impressions were made using impression compound for the maxillary arch and irreversible hydrocollide for mandibular arch. Post space was made to use approximate size of the extra coronal attachment. Canals can be prepared using passo reamers of 4,5,6 sizes corresponding to the sizes of extra coronal attachment (figure.2). Passo reamer of size 4 was finalized for this case. Obturated root canals were explored with passo reamers in a sequential manner on premolars bilaterally to remove gutta percha 4mm short of the apical foramen. After achieving adequate post space on mandibular premolars bilaterally, the prefabricated semiprecision attachments were inserted individually into each canal for checking the parallelism and fit. These attachments were then cemented on both mandibular premolars bilaterally using glass inomer cement (figure.3). Following custom tray were fabricated using self cured acrylic resins, border moulding for maxillary arch was made using the low fusing green-stick material while the border moulding for mandibular arch were done using putty, final impressions for maxillary arch was made using zinc oxide eugenol paste while the final impression for mandibular arch were made using medium bodied additional silicone. Record bases were fabricated. Then occlusal wax rims were prepared after which the casts were mounted on a semiadjustable articulator, teeth arrangement and further try-in procedures were carried out. The maxillary and mandibular dentures were processed using the conventional methods of processing. Bilaterally the intaglio surface of mandibular denture near premolar region was relived using carbide burs to incorporate female component. The female component was fabricated using the self cure acrylic resin and orthodontic elastic module acting as an elastic O-ring. This was later incorporated in the intaglio surface of the denture base (figure.4).

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The finished and polished dentures were then inserted in the patient's mouth providing support and proprioception (figure.5).

**DISCUSSION:** Prothero 1916, gave the earliest references to use the roots for providing support.<sup>6</sup> The overdenture provides a series of advantages over the conventional complete denture like preservation of bone, increased retention and stability and proprioception.<sup>7,8</sup>

In this case the retained teeth were the premolars. The premolars form the most ideal location for an overdenture abutment as they are link between the occluding molars and incising incisors, thus they serve the purpose. Also as the teeth were prepared to the gingival level, the lost height of the coronal portion itself provided the space for the overdenture attachment. The added advantage of stud type of attachment is that they were low profile, Easy hygiene maintenance and enhanced crown/root ratio.

Considering the cost factor as a major issue in rural set up the patient should not be denied of the possible treatment option. Hence this system was initiated of low cost prefabricated semi-precision overdenture attachments as the overdentures are a superior health service compared to the conventional complete dentures.<sup>1</sup>

**CONCLUSION:** Preventive prosthodontics being the rationale, preservation of the existing teeth and extending an alternative to conventional dentures by the use of tooth supported overdentures would be the most plausible choice in the long run. It is reasonable to say that retention of a part of natural dentition affords the overdenture patient a gain in the neuro-muscular performance, thereby giving him an edge over his edentulous counterpart. Careful case and abutment selection, patient motivation and periodic recall are the keys to successful prosthetic rehabilitation. This case report describes a simplified technique for improving overall prognosis, especially in mandibular overdenture using the pre-fabricated semiprecision attachment thereby minimizing the patient visit, and most importantly making this treatment available to low socio-economic category people, thus being helpful in rural areas where people opt for second line of treatment options just due to cost factor.

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figure.1 Partially edentulous mandibular arch



figure.2 Prefabricated Semi precision overdenture attachments



figure.3 Cemented Semi precision attachments



figure.4 Female components incorporated in the intaglio surface of mandibular denture



figure.5 Denture providing support and proprioception