

**Cast partial denture with semi-precision attachment in maxillary arch against the bar-retained overdenture - A case report**

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**Abstract**

Treatment planning in the case of a partially edentulous patient is a challenge.

Successful rehabilitation of the dentition requires meticulous contemporary and conventional treatment planning and attachment retained partial dentures are one such kind of treatment modality.

Semi-precision provides the exceptional feature of improved retention, improved comfort, aesthetics and less postoperative adjustments to the cast partial denture.

In This case report fabrication of cast-partial denture with Rhein’s attachment and along with bar-retained overdenture has been discussed in a simplified manner.

**Keywords:** Semi - Precision Attachment, Rhein’s Attachment, Bar- Retained over Denture.

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**Introduction**

An attachment is a connector consisting of two or more parts. One part is connected to a root, tooth or implant and the other part to prosthesis. (GPT 8).

There are two types of attachments: 1. Precision Attachments 2. Semi-Precision Attachment

A precision attachment is fabricated from milled alloys. A Semi-Precision attachment is fabricated by the direct casting of plastic, wax, or refractory patterns<sup>1</sup>.

**Case report**

A 58-year-old female patient reported to the Department of Prosthodontics with chief complaint of missing teeth. Examination revealed missing teeth in upper posterior region bilaterally (Kennedy’s class 1) with a faulty restoration w.r.t 12 and canines in each quadrant in the lower arch. Patient had a concern of having diastema in anterior teeth.

Dental history revealed recent extraction w.r.t 14 which was done a month ago. Extraoral examination showed no gross asymmetry.

### Treatment plan

Patient was advised for the removal of crown w.r.t 12 followed by Post and core restoration as most of the tooth structure was lost. Metal ceramic restoration was planned from canine-to-canine for the closure of diastema. Cast partial denture with semi precision attachment was advised for rehabilitation of posterior teeth and bar retained overdenture for lower arch.

### procedure

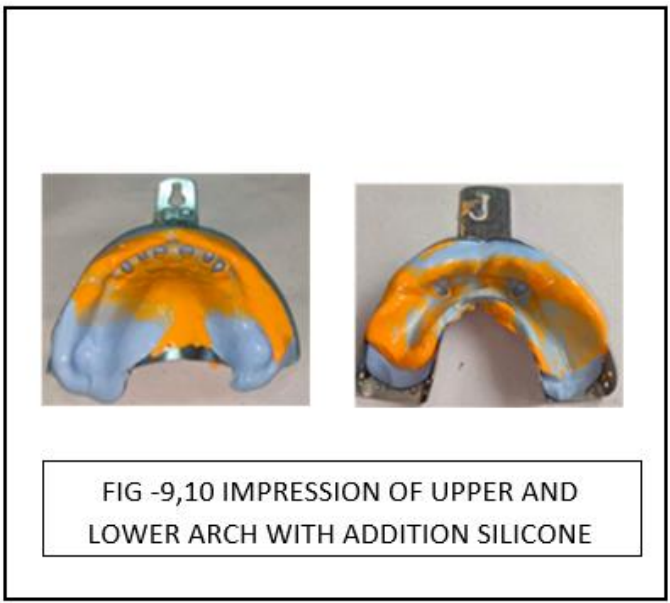
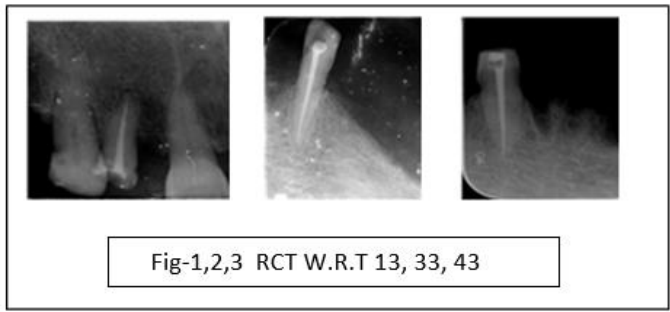
Endodontic retreatment was done w.r.t 14 after removal of crown as radiograph revealed under-obtured canal<sup>fig1-3</sup>, followed by post and core restoration<sup>fig4-6</sup>. Root canal treatment was done for both the canines in lower arch which served as abutments for overdenture<sup>fig1-3</sup>.

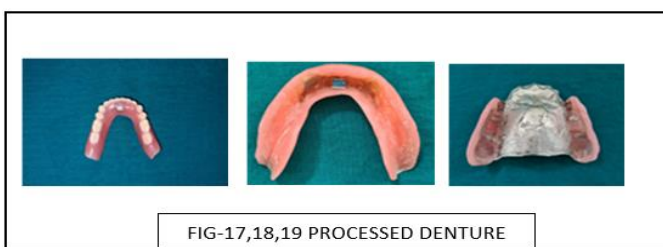
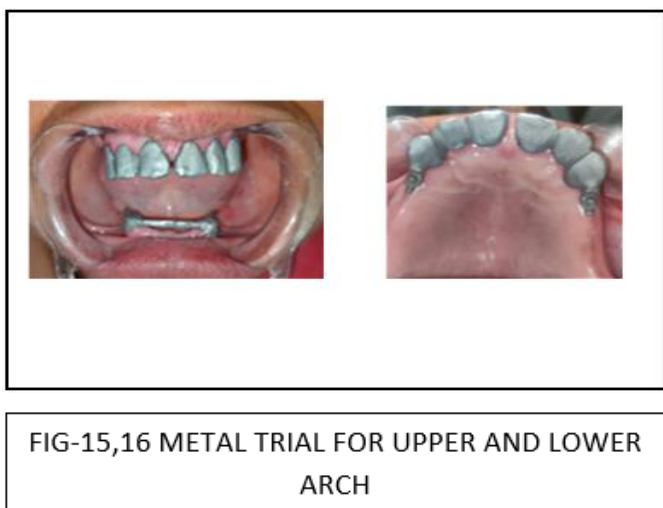
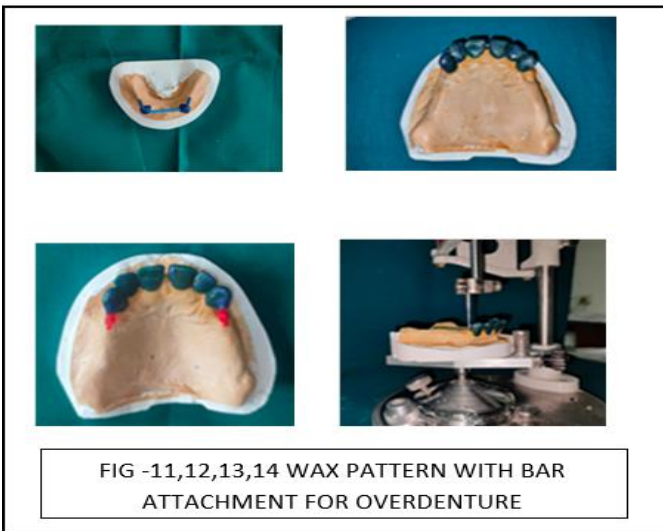
Tooth preparation was done from canine to canine in upper arch and in lower arch both the canines were prepared for the fabrication of bar retained overdenture<sup>fig-7,8</sup>.

Impressions were made with polyvinyl siloxane for upper and lower arches. Bar attachment was fabricated for abutments of overdenture<sup>fig9-10</sup>.

For the upper restoration, surveying was done to check the parallelism of the distal aspect of canines bilaterally and Rhein's attachment pattern was waxed to the wax patterns<sup>fig11-14</sup>. This was casted to make the metal framework and try in was done followed by cementation of PFM restoration in 2 segments<sup>fig15-16</sup>.

In lower arch metal copings with bar attachment was cemented<sup>fig15-16</sup> and further fabrication of denture was done in the conventional manner. The tissue surface of denture had the metal housing that will clip on to the bar during insertion of denture<sup>fig17-18</sup>.





## Discussion

Semi-precision attachment is made by direct casting of plastic wax or refractory pattern. It provides the exceptional feature of improved retention, improved comfort, aesthetics and less postoperative adjustments to the cast partial denture<sup>2</sup>.

Indications of semi precision attachment

- Long span edentulous arches.
- Distal extension bases.
- Nonparallel abutments.

The selection of intracoronal or extra coronal attachment should be based on the size and shape of the abutment teeth. Intracoronal attachments require more tooth preparation and tooth reduction than extra coronal attachments<sup>3</sup>.

Extra coronal attachments are positioned entirely outside the crown contour. Advantages of using extra coronal attachments are that the normal tooth contour can be maintained, minimal tooth reduction is needed. Most extra coronal attachments have some type of resiliency (stress redirectors). It is however, more difficult to maintain hygiene with extra coronal attachments and patients should be instructed on the use of dental floss and hygiene accessories.

## Rhein's attachment

The use of this attachment enhances the esthetics of the prosthesis compared to conventional clasps and provides trouble-free oral hygiene maintenance. Other advantages included directing the forces toward the long axis of the tooth and better tolerance due to the reduced number of components<sup>4</sup>.

A bar overdenture is used in this case report is an excellent prosthetic option that many patients choose over other treatment modalities for several reasons like having more retention than a conventional denture, providing better support than a tissue-supported

prosthesis, functioning better because it is more stable, being more comfortable to the patient<sup>5</sup>.

Bar attachment retainers have the dual role of acting as splints for roots spanning the edentulous space and providing overdenture retention. Because the bar is positioned close to the mandibular alveolar bone, torquing forces applied through the bar will be less than the torquing forces applied through the occlusal rests of a mandibular removable partial denture<sup>5</sup>.

### Conclusion

The stress control on abutment is an essential factor for the success of distal extension cast partial denture, which is achieved through accurate impression technique, broad coverage, stable denture base, splinting of abutments and proper selection of attachment. With proper case selection and treatment planning, semi-precision attachments are the viable option and can enhance retention, esthetics, and function<sup>2</sup>.

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