

**Precision Attachment Retained Removable Partial Denture: A Case Report**

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**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

**Abstract**

The most challenging job for a prosthodontist is to rehabilitate the partial edentulous patient especially distal extension cases where fabrication of fixed prosthesis is quite impossible without using implants. Attachment-retained Removable Partial Denture (RPD) is not an outdated treatment modality. It is even more contemporary in today's appearance-oriented society than when it was first introduced. There is significant number of patients who could benefit from this treatment option, both short and long term. A unique concern of a distal extension removable denture when compared to others is retention. The component of a removable partial denture which provides retention is called direct retainer. An extra-coronal direct retainer can be either a clasp or an attachment. Attachment provides more retention and stability coupled with better esthetics than a clasp. Often, in distal extension cases,) attachments are more advantageous. This case report provides a simplified

approach for rehabilitating the partially edentulous situation using precision attachment.

**Keywords:** Cast Partial Denture, Precision attachment, Extra-coronal, Matrix, Patrix.

**Introduction**

The selection of prosthesis for rehabilitating partially edentulous mouth is basically dependent on extent of edentulous region, position of edentulous space, ability of abutment teeth to resist occlusal load, mucosal condition as well as underlying residual bone. Rehabilitation of partially edentulous situations can be challenging when there are distal extension situations where fixed prostheses cannot be fabricated. Implant retained restoration are an option but this is sometimes not possible due to insufficient amount of bone or economic reasons. In these cases acrylic or cast partial denture is largely preferred, with barely satisfactory esthetical results. Precision attachment has long been considered the highest form of partial denture therapy. Attachment retained RPD is the treatment modality that can facilitate both esthetic and a

functional replacement of missing teeth and oral structures. The few retrospective studies available show a survival rate of 83.3% for 5 years, of 67.3% up to 15 years and of 50% when extrapolated to 20 years.

### **Case Report:**

A 30 year old male patient reported to the department of Prosthodontics, North Bengal Dental College & Hospital with difficulty in chewing food because of multiple missing maxillary and mandibular posterior teeth due to decay. On examination of the maxillary and mandibular arches, 16, 25, 26, 27, 46, 47 were missing. In maxillary arch, there was a Kennedy class II modification I situation with rotated 17. In mandibular arch, there was a Kennedy class II situation. A full coverage crown with mesio occlusal rest on rotated 17 followed by a cast partial denture was planned for the maxillary arch. Crowns on 44, 45 with extra coronal precision attachment (patrix with crown and matrix with removable prosthesis) was planned for the mandibular arch.

### **Technique:**

The diagnostic impressions were made using irreversible hydrocolloid impression material. The casts were prepared using type III dental stone. Tentative jaw relation was recorded to assess the inter arch space, which was found to be satisfactory.

Maxillary diagnostic cast was surveyed by Williams' surveyor. Cast partial denture design was planned. Accordingly mouth preparations were done which included full coverage crown with mesial occlusal rest seat preparation on rotated 17 [Figure 1], distal occlusal rest seat preparation on 15, cingulum rest seat preparation on 13, mesial occlusal rest seat preparation on 24, guiding plane preparation on distal proximal surface of 15 and 24 [Figure 2]. In mandibular arch tooth preparations of 44

and 45 was done for metal coping attached with precision attachment. [Figures 3, 4, 5].

The final impressions were made using addition silicone impression material. [Figure 6]. The casts were prepared using type IV dental stone. Casts were sent to lab for fabrication of metal frame work for maxillary arch and metal copings with precision attachment for mandibular arch. [Figure 7]

Try in of maxillary partial denture frame work and mandibular metal copings were found to be satisfactory. A pick-up impression of metal coping along with patrix (male part) was made using addition silicone impression material. Occlusal rims were fabricated on metal frame work and jaw relation was recorded. The models were sent to lab for teeth setting. [Figure 8a, 8b]

Trial of waxed up maxillary prosthesis was satisfactory [Figure 9a, 9b]. In mandibular arch, crowns with patrix of precision attachment were snugly fitted on prepared crowns [Figure 10, 11] and removable prosthesis with matrix (female part) was successfully fitted on patrix attached to crown. [Figure 12a, 12b]. Occlusion was checked, necessary adjustments done and the prosthesis was processed.

Final maxillary prosthesis was successfully delivered. [Figure 13a, 13b]. In mandibular arch, crowns with patrix part of precision attachment were cemented by luting cement (Type I GIC) on prepared tooth. [Fig 14] After 24 hours, removable prosthesis with matrix (female part) was successfully delivered to the patient following a thorough check upon the occlusion. [Fig 15]

### **Discussion:**

Dr. Herman Chayes first reported the invention of attachment in early 20th century. To the late 20th century, with growing technology the attachment has been applied to the superstructure of implant. Precision attachment has exceptional feature of being a removable prosthesis with

improved aesthetics, less post-operative adjustments and better patient comfort. They are mostly indicated in long edentulous spans, distal extension bases and non parallel abutments. The distal extension precision attachment acts by “**broken stress philosophy**” so as to reduce stress to the abutments and help in free rotational vertical movements. Understanding the difference in nature and behavior of the tissues supporting RPD is critical for long term success of the prosthesis. These differences multiplied by the function create major stresses on the tooth-tissue prosthesis. The stress-control on abutment is an essential factor for the success of distal extension cast partial denture which is achieved through dual impression technique, broad coverage and stable denture base, rigid design, splinting of abutments, proper selection of attachment and clasp design.

The customized attachments can overcome the disadvantages those which are associated with intracoronal attachments as (1) excessive tooth reduction (2) compromised embrasures and (3) poor esthetics, as well as they give the broad range for choosing alloys and easy handling. Most of the studies have shown that attachment retained cast partial dentures gives better comfort, function, esthetics, less adjustments, protect abutment teeth are easy to clean and can be worn most of the time by the patient. Its use in fixed prostheses, over dentures and in implant therapy contributes to the success of prosthesis in terms of esthetics, comfort and function.

### **Conclusion**

Removable partial dentures fabricated with precision attachments are the viable options for patients in whom fixed prosthesis, implants are contraindicated. Adherence to precision techniques, proper diagnosis and periodic recall preventative therapy will result in successful treatment and preservation of the patient's existing dentition.

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### **Legends Figure**

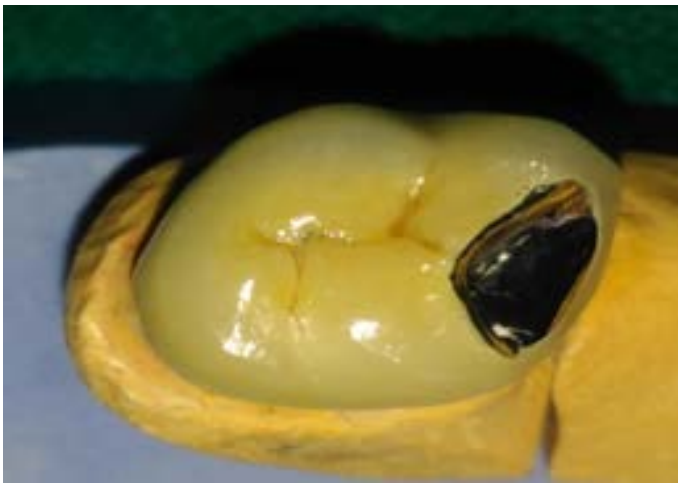


Figure 1



Figure 4



Figure 2



Figure 5



Figure 3



Figure 6





Figure 7



Figure 9a



Figure 8 a



Figure 9b

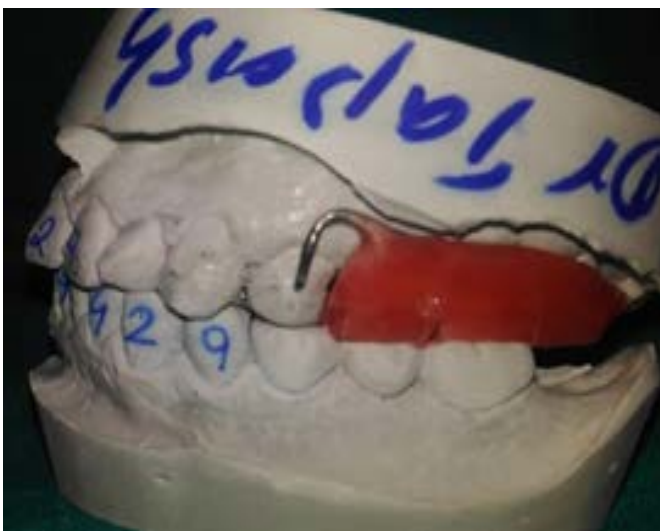


Figure 8b



Figure 10

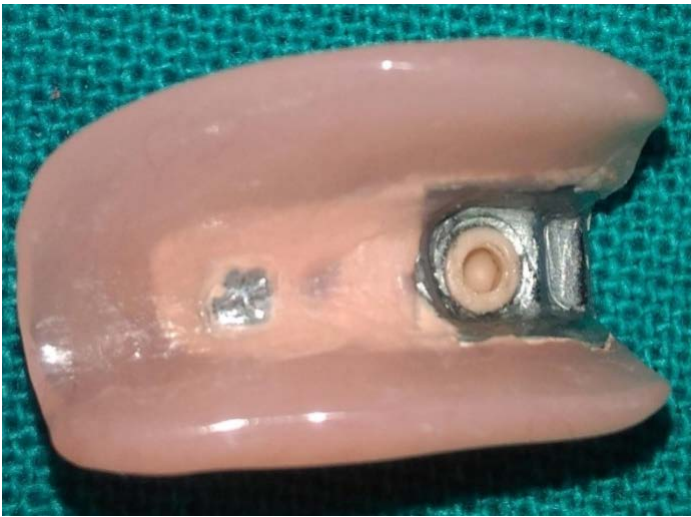


Figure 11



Figure 13a



Figure 12a



Figure 13 b



Figure 12 b



Figure 14





Figure 15: Maxillary & Mandibular prostheses in occlusion in patient's mouth