

**PRECISION RETAINED PARTIAL DENTURE - A PROXY TREATMENT OPTION
FOR FULL MOUTH REHABILITATION**

Dr Khurshid Mattoo^{1*}, Dr Manas Singh², Dr SP Singh³

^{1*} Assistant Professor, Department of Prosthodontics, College of dentistry,
Jazan University, KSA

² Lecturer, Ideas Dental College and Hospital, Rohilkhand University, Bareilly, India

³ Professor and head, Department of Prosthodontics, Subharti dental college,
Subharti University, Meerut, India

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For Correspondence

Email ID:

drkamattoo@rediffmail.com

Abstract

Complex partial edentulous situation rehabilitations demand knowledge, skills and more importantly decision making from prosthodontist. The difference between a patient receiving a removable prosthesis or a fixed prosthesis depends largely on these factors. A precision retained fixed partial denture is one such treatment option which even specialists rarely indicate for their patients. This article describes diagnosis, treatment plan, procedure, method and technique that is associated with precision retained fixed partial dentures. A complex partial edentulous situation was successfully rehabilitated using a combination of both removable and fixed partial denture.

Key words: Endodontic, porcelain, base metal alloy, semi precision attachment, connector

Introduction

Balance between functional stability and cosmetic appeal in partial dentures have led to the development of Precision Attachments, since then, Precision Attachments have always been surrounded by an aura of mystery. The use of Precision Attachments for partial denture retention is a practice builder for the better class of dentistry and helps to elevate the general standard of partial denture prosthetics. It is defined as a retainer that consists of a metal receptacle (matrix) and a closely fitting part (Patix), the matrix being contained within normal or expanded contours of the crown and Patix attached to a pontic or a partial denture framework.¹ Materials employed to fabricate precision attachments include gold,

platinum and iridoplatinium for those precision attachments that are ready to use.^{2,3} Although there are different types of precision attachment, basically they are either intracoronal or extra coronal, prefabricated or custom made, rigid or flexible.⁴⁻⁶

Selection of an intra-coronal or extra coronal attachment is based on design considerations for the prosthesis and the morphology, location and position of the abutment tooth.^{7,8} The choice of using a precision attachment for retention of either a removable or a fixed partial denture depends on the individual case, as does the selection of a particular type of precision attachment for that particular case.⁹⁻¹² In complex partial edentulous situations the choice

between a removable and a fixed option is dependent on designing of entire prosthesis as well as the type of the connector chosen for the purpose. This article describes a complex partial edentulous situation for both maxilla and mandible that was successfully rehabilitated by a precision retainer fixed partial denture for the maxilla and a coping retained overdenture for the mandible.

Case report

An elderly male patient, aged 43 years reported to the department of Prosthodontics for replacement of natural teeth that were lost as a result of caries and periodontitis over a period of a few years. Medical, social, drug and dental history were non-contributory. Extra oral features were normal. Intra orally the maxilla presented seven teeth and the mandible had four teeth. Significant clinical findings included teeth had undergone severe attrition. After radiographs and other clinical investigations the treatment plan presented to the patient was an anterior fixed partial denture connected with a precision attachment with individual crowns of remaining maxillary posterior teeth and a coping retained mandibular overdenture. The treatment also included an oral hygiene maintenance program, followed by surgical crown lengthening of all maxillary teeth and endodontic treatment of all natural teeth. As the maxillary rehabilitation would take more time, therefore the treatment was started with the mandibular first. After endodontic treatment and surgical crown lengthening of the natural teeth, the mandibular teeth were prepared to receive cement retained short copings for the mandibular single overdenture (**Fig.1**). Following the prosthodontic principles of rehabilitation of occlusion, maxillary premolars were first cemented at established vertical dimensions of occlusion (**Fig.2 A**) after which the maxillary anterior teeth were prepared to receive a precision retained fixed partial denture. After making the impressions with silicone elastomeric impression material

(Reposil, Dentsply/Caulk; Milford, DE, USA) using the putty reline technique (**Fig.2 B**), a master cast was prepared on which individual dies were prepared and cut using Pindex system of die preparation (**Fig.2 C**). This was followed by preparation of wax pattern (Harvard, Germany) for the longest side of the fixed partial denture (**Fig.2 D**) to which a prefabrication plastic precision attachment (Bredent attachment systems, USA) (VS-3 mini) (**Fig.2 E**) were attached which was later cast into base metal alloy (**Fig.2 F**). The matrix portion was attached to the wax pattern while the Patrix was attached to the cast framework. The second half of the fixed partial denture was then fabricated by making a wax pattern that was attached to the cast framework (**Fig.3 A**). After the second casting procedure the entire assembly was tried on the master cast to fit of the two components, especially at the connector (**Fig.3 B**). Individual components of the precision retainer were then tried in the patient (**Fig.3 C and D**). Feldspathic porcelain (VMK-95 MetallKeramik; Vita Zahnfabrik, Bad Sackingen, Germany) was fired onto each component and porcelain trial was done (**Fig.4 A and B**).

For mandibular overdenture all the endodontically treated teeth were prepared both extracoronally as well as within the root canal (**Fig.5 A**). This was followed by a putty reline impression (Reposil, Dentsply/Caulk; Milford, DE, USA) of the root canals using small pins (**Fig.5 B**) and pouring the master cast with die stone (Ultrarock, Kalabhai Dental, India). (**Fig.5 C**). After making the wax patterns (**Fig.5 D**), cast copings were cemented into the prepared root canals with zinc phosphate cement (Harvard, Germany) (**Fig.5 E**). Mandibular overdenture was fabricated (**Fig.5 F**) and the prosthesis was placed opposite the precision retained fixed partial denture (**Fig.6**). The patient was given instructions regarding oral hygiene maintenance and was put on regular follow

up. The patient was satisfied with the outcome of the prosthesis.

Discussion

When choosing an attachment, the important parameter in its selection is the length and not the width. The attachment selected for this case was rigid because the teeth were present on either side of the pier abutment. The attachment is essentially a tube with a sleeve joint that provides bulk to the connector. For clinical cases where the extra coronal cast clasp displays the retention arm of a cast partial denture, the precision attachment of such types provide an alternative option for patients to be treated with a fixed partial denture. Other advantages include less stress to abutment than conventional clasp, assured reciprocity and better cross arch force transmission and stabilization than clasps.^{13, 14} Due to the deep location within the confines of the tooth the precision attachment directs stresses along the long axis of the tooth which is favored by the periodontal ligament. Stress direction is also concentrated near the axis of rotation of the tooth, thus providing an ideal leverage.^{15, 16} Drawbacks associated with the use of precision retained fixed partial dentures include excessive reduction, bulge, technically sensitive and reduction of space for pontic.

Conclusion

Within the scope and limit of this clinical case report, it can be concluded that partial edentulous situations that are complex, can be successfully rehabilitated with precision attachment retained fixed partial denture provided the partial denture is designed based on sound principles.

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FIGURES

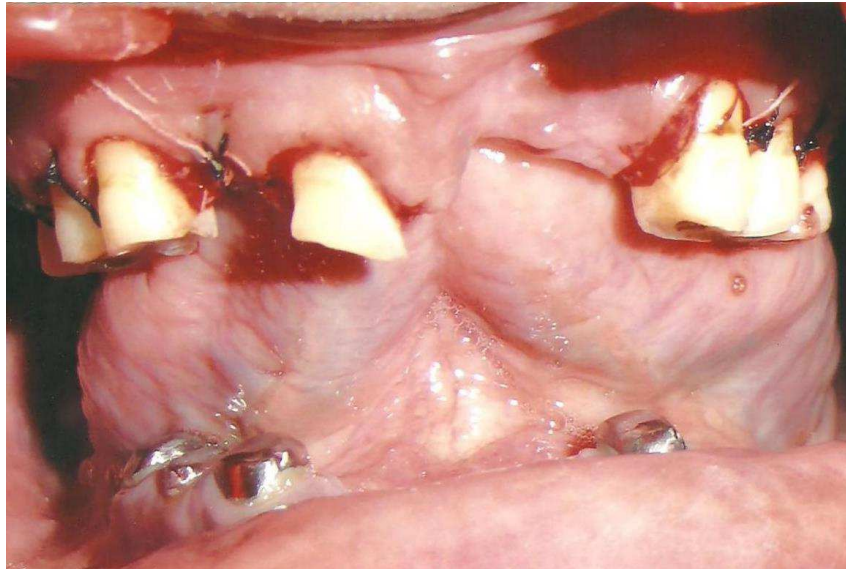


Figure 1: Intra oral view showing cemented mandibular copings and sutures after crown lengthening

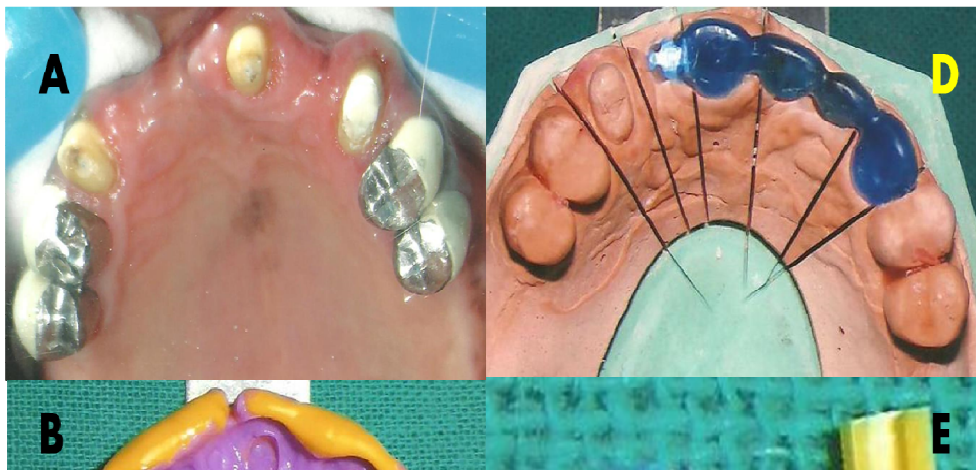


Figure 2: (A) Single crowns cemented on posterior teeth (B) Putty relin impression (C) Die preparation (D) Wax pattern for one segment (E) Precision attachment (F) Cast framework carrying the matrix and patrix



Figure 3: (A) Wax pattern fabricated over cast framework (B) entire cast framework with precision attachment (C) Metal trial of one side (D) Metal trial of entire precision retained partial denture



Figure 4: Porcelain trial on the patient with (A) one side (B) entire assembly

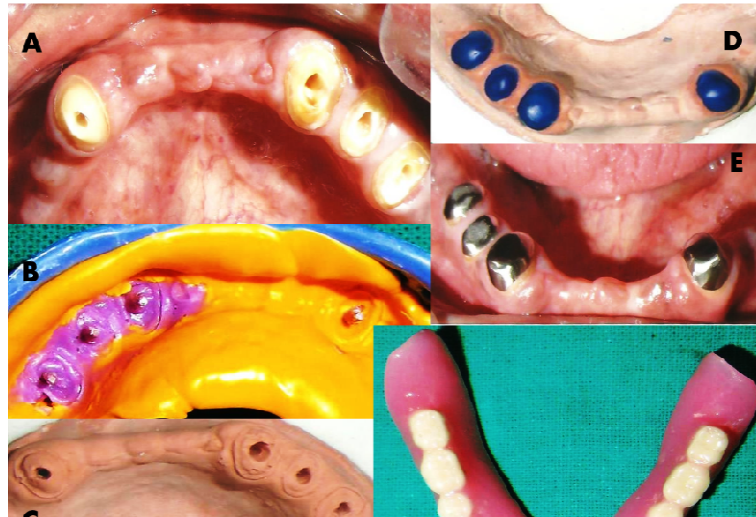


Figure 5: Steps for mandibular over denture fabrication with post space preparation
(A) Impression (B) Die preparation (C) wax patterns (D) short copings (E)
and final processed denture (F)



Figure 6: Final prosthesis in place