

Prosthetic Rehabilitation Using Extra Coronal Castable Precision Attachments

Abstract

Treating a patient with a long span partially edentulous situation can be challenging especially when multiple teeth are missing. Successful restoration of such situation can be done with various conventional and contemporary treatment options. One such treatment modality is attachment-retained partial dentures. Precision attachments play an important role in dentistry by offering excellent means of retaining a prosthesis. Cast partial dentures can be retained by using precision attachments. However, there are many factors which need to be considered before undertaking the treatment. An accurate case selection is of paramount importance. This article describes prosthetic rehabilitation a patient with removable partial dentures having an extra coronal castable precision attachment attached to the abutment crowns.

Key Words

Precision Attachments. Removable Partial Dentures.

Introduction

Esthetically and functionally successful prosthetic rehabilitation requires careful attention and meticulous treatment planning. Rehabilitation of partially edentulous arch can be challenging when it is a distal extension situation or long edentulous span^[1]. Implants are always the first choice of treatment in this situation, but sometimes it is not feasible due to insufficient amount of bone and economic reasons. So, in such situation an acrylic partial denture or a cast partial denture is largely preferred. Removable partial dentures are made retentive by the use of retainers and precision attachment components^[2]. Attachment retained RPD is the treatment modality that can facilitate both esthetic and a functional replacement of missing teeth and oral structures^[3]. Precision 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. Precision attachments can be classified into four main groups^[4]: 1. Intracoronal attachments, 2. Extra coronal attachments, 3. Stud attachments and 4. Bar attachments.

Selection of precision attachment should be based on the functional and physiological requirements of the prosthesis. It provides sufficient balanced retention than conventional clasp type acrylic RPDs. When the removable partial denture is essential, the precision attachment provides the most

equitable and definite means of distributing stresses. In some instances it is by far the most satisfactory means of replacing teeth with reasonable certainty that oral health be maintained^[5]. The great advantage of precision attachment appliances over those retained by clasps is not only the elimination of wedging but the fact that all horizontal stresses are most favourable distributed^[6].

This paper describes a case report of a patient with long span edentulous area having tooth no.37 and 47 in good conditions. Prosthetic rehabilitation is done by a cast partial denture using an extra coronal castable precision attachments on remaining teeth.

Case Report

A 48 years old female reported with missing mandibular teeth bilaterally. She gave a history of unsatisfactory wrought clasp based acrylic partial denture wearing. On intraoral examination (Figures 1), it was noted that the patient had 37, 47 teeth present in mandibular arch with 38 partially erupted (Kennedy's class IV subdivision). Teeth no. 17, 18 and 28 were missing in maxillary arch. Remaining teeth were periodontally stable.

After complete clinical and radiographic examination, a prosthetic treatment plan was set up. Cast partial prosthesis with extra coronal precision attachments on teeth no 37 and 47 was planned for

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mandibular arch. Tooth preparation of teeth 37 and 47 was performed to receive metal crowns. Models were poured and sent to dental lab. Wax patterns of abutments for 37 and 47 were made and surveying was done on the surveyor (Unident, India).

Metal crowns waxed up with castable attachment structure (RHEIN83 USA OT ATTACHMENT) were casted in the laboratory. The metal trial was done in the mouth to check the exact fit of the crowns. (Figures 2).

In the next step cast partial denture framework with retentive & reciprocal arm was fabricated in the laboratory.



Figure 1 : Pre-operative Intraoral View.



Figure 2 : Try-in Of The Metal Crowns With Attachments.



Figure 3 : Jaw Relations On The Articulator



Figure 4 : Waxed-up Denture In Patient's Mouth.



Figure 5 : Acrylised Prosthesis With Circumferential Clasps

Metal framework trial was done in the patient's mouth for the accuracy of fit. Cast structure framework was checked up for stability and precision and jaw relation were recorded. (Figures 3).

Waxing up of teeth was performed and teeth setting trial was done in patient's mouth (Figure 4).

The trial denture was sent for acrylization and cast partial denture finished (Figure 5).

Complete seating of finished mandibular metal crowns with extra coronal castable precision attachment was evaluated clinically and cementation of crowns was done using Glass Ionomer cement (GC Fuji). Cast RPD with RHEIN 83 OT silicon caps were fitted and checked for retention (Figure 6).

In the next step OT silicon caps were picked up in cast prosthesis with self cure acrylic in the predetermined space (Figure 7).

After final finishing and polishing the prosthesis was delivered to the patient and the patient was recalled after 24 hrs for post insertion follow-up (Figure 8 & 9).

Discussion

Precision attachment gives a removable prosthesis the exceptional feature of improved retention, less postoperative adjustments, and improved comfort. It is mostly indicated for long-span edentulous arches, distal extension bases, and nonparallel abutments^[7]. There is a wide range of attachments available for use in all manners of restorative procedures, from partial dentures to implant-supported prosthesis. By analyzing study models and X-rays, the clinician can make several important points of determination, each of which will influence final attachment selection. Apart from improving esthetics and retention of removable partial dentures, the availability of precision attachment has made outcome more predictable or favourable. Various cases with esthetic and retention challenges can be solved with correct selection of attachment. However, there are some contraindications to the use of attachment in removable partial dentures. Short clinical crowns proves to be the foremost contraindication to the use of attachment, the tooth must have adequate crown



Figure 6 : Cemented Crowns With Rhein 83 Ot Silicon Caps



Figure 7 : Ot Silicon Caps In Final Acrylised Prosthesis



Figure 8 : Final Seating Of The Finished Prosthesis



Figure 9 : Post-insertion View Of Acrylised Prosthesis In The Patient's Mouth.

height to house the attachment components and effectively offset the leverage forces exerted on the crown. The parts of the attachment are usually exposed to wear and tear and needed to be replaced over time^[6]. Most of the attachments are very small and come with many parts to assemble. Construction of such attachment require skilled dental technicians and

competitive laboratory.

The RHEIN 83 OT CAP attachments system used in the case discussed is extra coronal castable attachment positioned on the mesial side of the crowns. The castable OT CAP male can be easily casted together with the crowns during wax-up stage avoiding complicated adaptation procedures like welding a metal attachment after casting of crowns. The male component design is sphere with a flat head and female component is retentive silicon caps which are colour-coded according to different retentive properties^[8]. In this case reciprocal and retentive arms were given which provides horizontal stability.

Conclusion

Precision attachment retained cast partial dentures are an excellent option for cases where retention is prime concern and economic condition does not permit the

use of dental implants. The results are excellent if appropriate case selection is done. The stress control on abutment is an essential factor for the success of the long span cast partial denture which is achieved through accurate impression technique, broad coverage and stable denture base, rigid design, proper selection of attachments & clasp design.

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