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A Technique for Fabrication of an Extracoronal Attachment-Retained Removable Partial Denture to Fit an Existing Fixed Partial Denture

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Abstract

Precision attachments have been used for many years to retain removable partial dentures (RPDs). Common reasons for a failed attachment-retained RPD are fracture of the framework, fracture of the roots or teeth, and irretrievable decrease of retention. When an RPD framework major connector has been fractured, it should be remade. This article describes a technique to remake a fractured mandibular RPD using cast round profile attachment analogs without the need for replacement of the fixed partial denture.

The retention of combinations of fixed partial dentures (FPDs) and removable partial dentures (RPDs) is achieved through clasps, adhesive attachments, intra- or extracoronal attachments, telescopes, root caps, and/or prefabricated interradicular retainers.[1] Various types of extracoronal attachments are commonly used in combinations of FPDs and RPDs to achieve retention and stability.[2] Castable extracoronal round profile slide attachments are resilient due to the duro-plast retention sleeves and semi-precision type attachments used to connect the distal-extension RPDs with FPDs. This plastic design of the attachment allows free movement of the prosthesis vertically. These attachments have plastic patrixes and matrixes. The castable patrix is attached to the crown pattern with a paralleling mandrel, and the matrix is incorporated into the cast framework using inserting tools. Common reasons for a failed attachment-retained RPD are fracture of the framework, fracture of the roots or teeth, and irretrievable decrease of retention.[3,4] When an RPD framework has been fractured, it should be remade, but previously no method has been described for replacing only the removable component of an attachment-retained combination FPD and RPD. This report describes remaking of a fractured mandibular RPD (Fig 1) retained by a five-unit FPD with distally attached round profile attachments using round profile attachment analogs.

Technique

1. Make preliminary impressions of both arches with irreversible hydrocolloid (CA37; Cavex Holland B, Haarlem, The Netherlands) using stock trays (Teknik Dis Deposu, Istanbul, Turkey). Pour the casts with type IV stone (BEGO, Bremen, Germany).
2. Prepare a mandibular acrylic resin custom tray (Paladur; Heraeus Kulzer GmbH, Hanau, Germany).
3. Cast two prefabricated round profile attachment patrixes (Soft friction normal vs3; Bredent, Senden, Germany) with a chrome-cobalt alloy (Biosil F; Degudent, Hanau, Germany) to use as analogs (Fig 2).
4. Place two prefabricated round profile attachment matrixes (Soft friction normal vs3 regular friction; Bredent) onto the distally placed round profile attachments of the mandibular FPD so the matrixes have the same occlusal level with the round profile attachments.
5. Block out under the attachment with dental wax (Dental Wax, Cavex) (Fig 3).
6. Make the mandibular impression with a polyether-based impression material (Impregum; 3M ESPE, Seefeld, Germany). Incorporate the round profile attachment matrixes (Soft friction normal vs3 regular friction) with the previously cast round profile attachment analogs (Fig 4). Insert into the impression cast round profile attachment analog-matrix assemblies. Pour the mandibular cast with type IV stone (BEGO) (Fig 5).
7. Cast the mandibular framework with a Cr–Co alloy (Biosil F).
8. Insert two round profile attachment matrixes (Soft friction normal vs3 regular friction) into the framework to obtain desired retention; verify the fit. Obtain horizontal and

Figure 1 Fractured mandibular RPD framework.

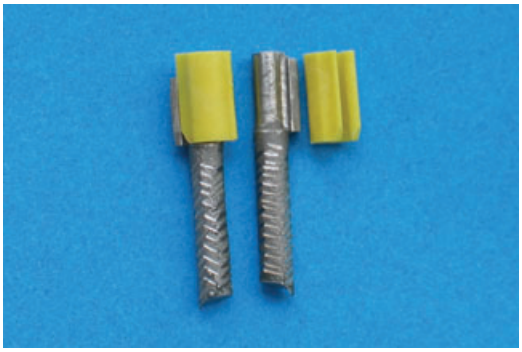

Figure 2 Round profile attachments patrixes cast with a chrome–cobalt alloy.

Figure 3 Placement of the prefabricated round profile attachment matrixes intraorally.

Figure 4 Round profile attachment analogs inserted into the mandibular impression.

Figure 5 Round profile attachment assemblies on the cast.

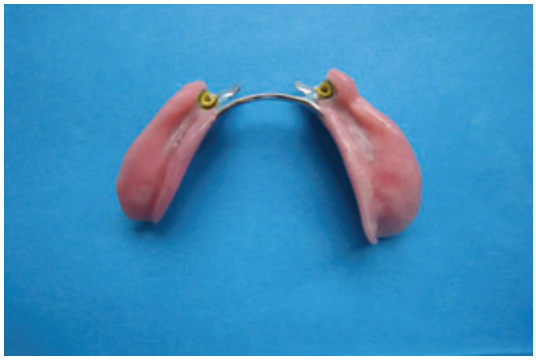

Figure 6 Intaglio view of the definitive prosthesis.

Figure 7 Intraoral view of the definitive prosthesis.

vertical maxillomandibular records with the framework and occlusion rims and transfer the casts to a semi-adjustable articulator (Denar Advantage; Teledyne Waterpik, Ft Collins, CO) using a face-bow transfer.

9. Select and arrange artificial teeth (Major; Major Prodotti Dentari, Torino, Italy) on the framework for a trial denture arrangement.
10. Evaluate the trial arrangement intraorally for esthetics, phonetics, occlusal vertical dimension, and centric relation. Make a protrusive record to set the articulator's condylar elements and obtain a balanced occlusal arrangement.

11. Process and finish the mandibular RPD using conventional techniques, and make an appointment for insertion (Figs 6 and 7).

Discussion

In general, when a precision attachment-retained RPD has a major connector fracture, the existing FPD should be removed to make a new RPD.[2] However, it is posible to make a new RPD without removing of the FPD. Remaking of a fractured RPD using round profile attachment analogs has not been reported previously. The described technique requires the placement of the prefabricated round profile attachment matrixes so the matrixes have the same occlusal level as the round profile attachments. Otherwise the desired vertical resiliency of the finished RPD cannot be obtained. Advantages of the described technique are reduced chairside time and treatment cost and increased patient satisfaction. A disadvantage of the technique is the increased technique sensitivity. A final impression with great accuracy is required, and all the attachment assemblies should be carefully inserted into the impression and framework to warrant the RPD to be fully seated. Detailed clinical studies are required to determine the further success of this treatment procedure.

Summary

Remaking of a fractured RPD using round profile attachment analogs has not been previously reported. This report describes remaking a fractured mandibular RPD retained by a five-unit FPD with distally attached round profile attachments using round profile attachment analogs.

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