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Replacement of a Lost Removable Partial Dental Prosthesis Using Ball-Attachment Analogs: A Clinical Report

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Abstract

Attachment-retained removable partial dental prostheses (RPDPs) may be lost. Although in such situations, the RPDP should be remade, no method has yet been described for replacing lost attachment-retained RPDPs. This report describes a method for fabrication of a replacement for a lost maxillary RPDP using ball-attachment analogs.

Precision attachments have been used for many years to retain removable partial dental prostheses (RPDPs).[1] In general, the retention of combinations of fixed and RPDPs is achieved through clasps, adhesive attachments, crowns, and fixed partial dentures (FPDs) with intra- or extracoronal attachments, telescopes, root caps, and/or prefabricated interradicular retainers.[2] Ball-retentive prefabricated extracoronal attachments are commonly used and are available in a wide range of dimensions and retentive matrix materials.[3] Ball attachments used for the connections between FPDs and RPDPs are characterized as nonresilient attachments.[4] Castable extracoronal ball attachments used for the connection between FPDs and RPDPs in distal-extension RPDPs are nonresilient, semiprecision-type attachments. Castable extracoronal ball attachments have plastic patrices and matrices. 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 RPDP are fracture of the framework, fracture of the roots or teeth, and irretrievable decrease of retention.[4,5] When an RPDP has been lost, it should be remade, but no method has previously been described for replacing only the removable component of an attachment-retained combination of FPDs and RPDPs.

This report describes fabrication of a replacement maxillary RPDPs using ball-attachment analogs.

Clinical report

A 60-year-old white woman was referred to the Department of Prosthodontics, Faculty of Dentistry, University of Ankara (Ankara, Turkey) for remaking a lost attachment-retained mandibular RPDP. The patient stated that she had been using the dentures fabricated in a private dental office for 2 years without any complaints, but that she had lost the maxillary RPDP.

She was offered a new treatment plan including remaking of the FPDs, and fabrication of an attachment-retained distal extension RPDP in the same dental office, but she declined the treatment plan due to the prolonged treatment time required, as well as the increased cost. Two three-unit FPDs restoring maxillary left and right canine, lateral incisor, and central incisor teeth with distally placed ball attachments and a full-arch mandibular FPD were noted in the initial clinical examination. The FPDs were observed to have acceptable occlusion and esthetics. No periapical or periodontal pathologies were noted in the radiographic examination. A new treatment plan including replacement of the RPDP was offered to the patient and was accepted. Preliminary maxillary impressions were made with an irreversible hydrocolloid (Cavex CA 37; Cavex Holland BV, Haarlem, The Netherlands) for fabrication of a custom tray. A maxillary custom tray was prepared with autopolymerizing acrylic resin (Meliodent; Heraeus Kulzer, Hanau, Germany). Two prefabricated ball-attachment patrices (Vks-Sg; Bredent, Senden, Germany) were cast with a chrome-cobalt alloy (Biosil F; Degudent, Hanau, Germany) (Fig 1). Any exposed clinical portions of the ball attachments below the seated matrices were blocked out with wax (Fig 2). The final impression was made using a polyether-based impression material (Impregum; 3M ESPE, Seefeld, Germany). A mandibular impression was made with an irreversible hydrocolloid (Cavex CA 37) using a stock

Figure 1 Cast ball-attachment analogs.

Figure 2 Prefabricated plastic matrices seated on the extracoronal ball attachments and the block-out procedure.

tray. The cast ball-attachment analogs were assembled with the prefabricated plastic matrices (Vks-Sg) and inserted into the impression (Fig 3). Impressions were poured with type IV stone (BEGO; Bremen, Germany) (Fig 4). A maxillary framework was cast with a base metal alloy (Biosil F; Degudent); the plastic matrixes were incorporated into the framework with the

Figure 3 The cast ball attachment analog-plastic matrix assembly inserted into the mandibular impression.

Figure 4 Ball-attachment analogs on the cast.

inserting tool (Bredent) and verified intraorally. After obtaining horizontal and vertical maxillomandibular records with record bases and occlusion rims, the casts were transferred to a semi-adjustable articulator (Denar Advantage; Teledyne Waterpik, Ft Collins, CO) using a face-bow transfer. Artificial teeth (Major; Major Prodotti Dentari, Torino, Italy) were selected and arranged on the record bases for a trial denture arrangement. The trial arrangement was evaluated intraorally for esthetics, phonetics, occlusal vertical dimension, and centric relation. A protrusive record was made to set the articulator's condylar elements, and a balanced occlusal arrangement was achieved. The denture was processed using a conventional heat-processing technique, finished, polished (Fig 5), and delivered to the patient. The patient was instructed in hygiene procedures associated with the dentures and scheduled for routine maintenance recalls. The patient has been followed for 12 months and has had no complications.

Discussion

RPDPs can be lost for several reasons. In such situations, the RPDP should be remade; but previously no method has been described for replacing only the removable component of an attachment-retained combination FPD and RPDP. Advantages of the described technique include reduced chairside time and treatment cost and increased patient satisfaction. A

Figure 5 Intaglio view of the definitive prosthesis.

disadvantage of the technique is the increased technical sensitivity required. A final impression with great accuracy is necessary and ball-attachment assemblies should be carefully inserted into the impression to ensure that the RPDP will be fully seated. Detailed clinical studies are required to determine the long-term success of this treatment procedure.

Summary

Common reasons for failure of attachment-retained RPDPs include: fracture of the framework, fracture of the roots or teeth, and irretrievable decrease of retention. In the patient described in this report, a maxillary distal-extension attachment-retained RPDP was lost. This report describes replacement of a lost RPDP using ball-attachment analogs.

References

1. Owall B: Precision attachment-retained removable partial dentures: Part 1. Technical long-term study. Int J Prosthodont 1991;4:249-257
2. Zitzmann NU, Rohner U, Weiger R, et al: When to choose which retention element to use for removable dental prostheses. Int J Prosthodont 2009;22:161-167
3. Burns DR: Mandibular implant overdenture treatment: consensus and controversy. J Prosthodont 2000;9:37-46
4. Owall B: Precision attachment-retained removable partial dentures: Part 2. Long-term study ball attachments. Int J Prosthodont 1995;8:21-28
5. Owall B, Jönsson L: Precision attachment-retained removable partial dentures. Part 3. General practitioner results up to 2 years. Int J Prosthodont 1998;11:574-579