

Solving the distal extension removable partial denture base movement dilemma: A clinical report

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The removable partial denture (RPD) continues to be an essential prosthetic consideration in many oral reconstructions, especially when edentulous ridges posterior to a patient's remaining teeth are to be restored. Posterior distal extension partial denture bases present a number of design challenges. Of particular concern is the equitable distribution of forces to maintain remaining alveolar ridges and teeth in an optimal state of health and to provide the patient with improved comfort and function.

The distal extension RPD is subjected to vertical, horizontal, and torsional forces that may become adverse during functional and parafunctional activities. These forces, which can affect denture retention, stability, and support, are often compensated for to some extent by framework and denture base design variations.¹

Osseointegrated implants with various superstructures have been incorporated into removable complete overdenture designs in an effort to better distribute adverse forces.²⁻⁶ However, the overdenture approach has not been reported for the functional enhancement of conventional RPDs.

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This clinical report describes such an approach using implants. This method is designed to optimize support for a conventional distal-extension RPD by reducing the effects of adverse forces with a resilient retentive and stabilizing implant stop.

PROCEDURE AND CLINICAL REPORT

This procedure involves the placement of an intraosseous implant in a posterior edentulous alveolar crest location, which would normally provide tissue support for the denture base of an RPD. When possible, the implant should be located in a position that is distal to the denture teeth on the base.

For this patient crestal anesthesia was used.⁷ After conventional two-phase implant surgical procedures,⁸ a 3.3 × 8 mm IMZ implant (Interpore Intl., Irvine, Calif.) was placed in the mandibular alveolar ridge crest and sealed with a healing screw (Fig. 1). The base of the RPD that the patient was wearing was relieved over the healing screw. The patient was permitted to wear the RPD during osseointegration. Although an IMZ implant was used for this patient, any good osseointegrated implant system may be considered.

After 6 months the healing screw was surgically ex-



Fig. 1. Panoramic radiograph of IMZ implant with healing screw in approximate location of mandibular left second molar.



Fig. 2. Titanium nitride-coated ERA abutment in region of mandibular left second molar.



Fig. 3. Partial denture base liberally relieved to allow for adequate impression material around ERA abutment complex.

posed and removed. A 0 degree overdenture abutment (APM-Sterngold, Attleboro, Mass.) and a titanium nitride-coated extracoronal resilient attachment (ERA) with a 2 mm tissue cuff was connected directly to the IMZ implant without the use of an intramobile element (Fig. 2). Alignment correction abutments should be considered if an implant is not or cannot be positioned favorably.

The denture base immediately over the implant abutment was relieved (Fig. 3). The entire intaglio surface of the RPD was coated with adhesive, and a conventional rubber base impression (Permlastic, Kerr Mfg. Co., Romulus, Mich.) was made of the ERA implant abutment, the attached ERA resilient fabricating attachment, and all tissue-bearing surfaces that were in contact with the prosthesis. A laboratory analog processing jig complex that simulated the implant abutment and resilient attachment was placed in the impression (Fig. 4). The impression was poured in dental stone with the analog complex in place.

The RPD was relined with the frictional nylon ERA abutment,⁴ which was retained to interface with the ti-



Fig. 4. ERA laboratory analog processing jig complex seated in elastomeric impression of RPD intaglio.



Fig. 5. Frictional nylon ERA key attachment seated in relined RPD base.

tanium nitride-coated ERA abutment attached to the implant (Fig. 5).

CONCLUSIONS

A dental implant can convert a distal extension RPD base from a tooth- and tissue-supported prosthesis to a tooth- and implant-supported and retained prosthesis. A posterior placed osseointegrated implant, with a resilient frictional abutment complex that is retentive and provides a definite stop and stability, virtually eliminates the myriad of problems often associated with a tooth- and tissue-supported distal extension RPD.

The RPD in this clinical report was designed to include three precision attachments. After implant placement the patient claimed that the implant-supported side

of the prosthesis felt more natural and was preferred for mastication over the tooth-supported side.

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Noteworthy Abstracts of the Current Literature

Clinical evaluation of resin-modified glass-ionomer restorative cements in cervical 'abrasion' lesions: One-year results.

Maneenut C, Tyas MJ. *Quintessence Int* 1995;26:739-43.

Purpose. The purpose of this study was to provide an assessment of the clinical performance of three resin-modified glass-ionomer restorative cements used for the restoration of cervical abrasion lesions.

Material and Methods. A total of 60 nonundercut class V "abrasion" lesions in a group of 13 patients were restored with light-cured type IIa glass-ionomer cements in accordance with the manufacturer's recommendations. Twenty lesions each were restored with Fuji II LC (GC Corp, Tokyo, Japan), Photac-Fil (Espe Premier, Seefeld, Germany), and Vitremer (3M Dental, St. Paul, Minn.). All restorations were finished and polished wet on the day of placement. Color match and marginal discoloration were assessed with color photographs taken at placement and 6-month and 1-year recall appointments and were measured against a standard set of photographs on a continuous linear rating scale for color match and discoloration. Retention of the restoration was assessed at each recall period. Data were collected and then analyzed with Student *t* test.

Results. Statistically significant darkening in the color of the Vitremer restorations was revealed during the observation period, but there was no statistically significant change in the color of the other two restorative materials. There was a statistically significant but clinically negligible development of marginal discoloration of all three restorative materials. After 1 year there was a 100% retention rate of the restorations. 54 References.—RP Renner