Use of the Rotational Path Removable Partial Denture Concept in a Kennedy Class II Patient: A Case Report

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ABSTRACT

This case report describes the treatment of a patient with Sjogren's syndrome who was missing all of the posterior teeth in the maxillary left arch. Implants were contraindicated for this patient because of a chronic sinus infection. Various removable prosthodontic options were considered, and the patient was ultimately treated very conservatively with a rotational path removable partial denture (RPD). This approach required no tooth preparation other than bonding a resin composite cingulum rest on the maxillary left canine. The use of the rotational path RPD eliminated any unsightly clasp assembly display and provided a satisfactory esthetic result.

CLINICAL SIGNIFICANCE

The rotational path removable partial denture is an underutilized option for the esthetic replacement of missing teeth. It should be considered as an option in both tooth-borne and Kennedy Class II situations.

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INTRODUCTION

The rotational path removable partial denture (RPD) has been used extensively to predictably and successfully restore anterior and posterior tooth-bound edentulous areas for many years.¹⁻¹² However, there have been few reports of use of this concept with Kennedy Class II patients with a unilateral posterior edentulous segment.¹³ This case report describes the use of a rotational path RPD to restore the edentulous maxillary left quadrant in a Kennedy Class II patient. The patient was a 62-year-old female with Sjogren's syndrome who had lost teeth #12 to 15 due to root caries (Figure 1). The initial treatment plan was to restore the segment with implants; however, the maxillary sinus was pneumatized, and because the patient had a history of chronic sinus infection, the oral surgeon was reluctant to consider sinus augmentation and implant placement.

The patient requested an RPD, primarily for esthetic purposes. She was counseled that patients with dry mouth are poor candidates for RPDs and that this could potentially increase her susceptibility to dental caries. She agreed that she would only wear the partial denture on social occasions and that she would always remove it at night.

Preliminary impressions were made with irreversible hydrocolloid (Jeltrate Plus, Dentsply Caulk, Milford, DE, USA) and poured in Type III dental stone (Microstone, Whip Mix Corporation, Louisville, KY, USA). A primary consideration

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Figure 1. The diagnostic cast of the maxillary arch reveals the edentulous left posterior arch that was restored with a rotational path removable partial denture.



Figure 2. A bonded cingulum rest was created on the lingual surface of tooth #11 using resin composite material.

in the design of the RPD was finding a way to avoid an unsightly clasp assembly on tooth #11. The use of a ceramo-metal restoration with a positive cingulum rest and a semiprecision plunger attachment was considered.14 However, when the maxillary cast was surveyed, it was noted that a favorable undercut was present in the disto-buccal area of #11. If this undercut could be engaged and then the framework rotated into place in the maxillary right quadrant, a rotational path RPD could be considered. If this strategy was successful, tooth #11 would not have to be prepared and the long-term maintenance associated with attachments could be avoided.

Prior to making the final impression, the lingual surface of tooth #11 was etched with 37%

phosphoric acid, and a positive cingulum created with a bonded nanohybrid resin composite material (Filtek-Supreme Plus and Single-bond Plus, 3M Mfg., St. Paul, MN, USA) (Figure 2). Conventional rest seats were prepared on the occlusal surfaces of teeth #3 and 4. A custom tray was fabricated using Triad material (Dentsply Caulk) and the final impression made using addition reaction silicone impression material (Affinity PVS Impression Material, Clinician's Choice, London, Ontario, Canada) (Figure 3).

The master cast was poured in Type III dental stone, surveyed, blocked out, and duplicated. The prosthesis was waxed and a digital photo was sent to the clinician for approval prior to casting¹⁵ (Figure 4). The framework was cast in chrome-cobalt alloy and returned for framework try-in (Figure 5). The laboratory was instructed to cover the retentive portion of the framework, engaging the distobuccal undercut with wax prior to electropolishing to insure that retention would not be lost.¹⁶

At the try-in appointment, it was verified that the framework was very stable. The gingival extension of the proximal plate on tooth #11 engaged the gingival undercut (Figure 6). This portion of the framework was engaged first and then the framework was rotated so that the circumferential clasps on teeth #3 and 4 seated completely in their prepared rest seats (Figure 7). A facebow transfer was completed, and an interocclusal registration was made along with a shade determination. The casts were mounted



Figure 3. The final impression was made with PVS impression material in a custom tray.



Figure 4. A photo of the wax-up on the refractory cast was electronically sent from the laboratory to the dentist for approval prior to casting (courtesy of Drake Dental Laboratory, Charlotte, NC, USA).



Figure 5. The chrome-cobalt removable partial denture framework was returned for try-in.



Figure 6. The metal guide plate for the removable partial denture adjacent to tooth #11 engaged the disto-buccal undercut present in the gingival area.

in a semi-adjustable articulator (Whip-Mix Model 2240, Whip-Mix Corp., Lexington, KY, USA) and returned to the laboratory with instructions for processing.

The finished RPD was inserted with minor denture base and

occlusal adjustment (Figure 8). The esthetic results were excellent with virtually no clasp assembly display on tooth #11 (Figures 9 and 10). The RPD was very stable, and the clasp assemblies on teeth #3 and 4 were located far enough posteriorly to not be visible at all. The patient was reminded again to wear the RPD as little as possible and that removal of the prosthesis at night was mandatory.

In summary, the use of the rotational path RPD concept permitted a very conservative yet effective



Figure 7. Circumferential clasps were used on teeth #3 and 4.



Figure 8. The finished rotational path removable partial denture is ready for try-in.



Figure 9. Frontal, close-up, and occlusal views of the completed rotational path removable partial denture demonstrate an excellent esthetic result.



Figure 10. Frontal, close-up, and occlusal views (mirror shot) of the completed rotational path removable partial denture demonstrate an excellent esthetic result.

esthetic treatment for this patient with a Kennedy Class II defect. Successful use of this approach eliminated the necessity for crown placement and inherent maintenance associated with the use of precision attachments. Because the patient suffers from Sjogren's syndrome and concomitant dry mouth, she was warned to wear the prosthesis only on social occasions and that it should be left out of the mouth at night.

DISCLOSURE

The author has no financial interest in any of the products or companies mentioned in this article.

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