Restoration of the Partially Dentate Patient with Conventional Fixed and Removable Prostheses

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This clinical report documents the treatment of a 65-year-old Caucasian female referred for fixed and removable partial denture fabrication following completion of her orthodontic treatment.

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History

Chief Complaint

The patient's chief complaint was "I want my teeth fixed, and the gold premolar crown changed to one that is tooth-colored."

Medical History

A review of the patient's medical history revealed she was in good health. She had a history of hypertension, which was controlled with medication. At her initial appointment, her blood pressure was 125/80. The patient had a melanoma, which was surgically removed approximately 2 years prior to her initial visit, on her left leg. She was in complete remission. The patient used hormone replacement therapy and reported that she was allergic to Codeine.

Past Dental History

The patient's dental history indicated periodic dental examinations, oral prophylaxis, restorations of carious lesions, prosthodontics, endodontics, orthodontics, and extraction. The patient had a 4-unit fixed partial denture (FPD) from #3–6 for nearly 40 years. Surveyed abutment crowns on teeth #18, 21, and 29 had been completed 3 years ago. She had a mandibular partial denture, but no longer used it, due to discomfort. Tooth #12 was extracted due to endodontic failure. The crown on tooth #13 was fabricated for orthodontic movement in early 2000. Tooth #13 had been moved orthodontically to replace #12. The patient had completed orthodontic treatment and was wearing orthodontic retainers.

Clinical Findings

Extra-Oral Findings

There was no cervical lymphadenopathy. The patient had no muscle tenderness or facial asymmetry. Her mandibular range of motion was within normal limits. The temporomandibular joints, the muscles of mastication, and facial expression were asymptomatic.

Intra-Oral Findings

The patient was partially edentulous in the maxillary and mandibular dental arches, with teeth #1, 2, 12, 14–16, 19, 20, 30, and 31 missing. A small torus palatinus was present. Teeth #3–6 were restored with an FPD with acrylic facings. The facing was broken on #6. Tooth #3 had an open margin on the disto-lingual surface. The pontic for #5 was ridge-lap in design. A small diastema was present between #8 and 9 and between #11 and 13. Surveyed crowns had been constructed for teeth #18, 21, 29, and the mandibular removable partial denture (RPD) was in acceptable condition. Tooth #13 was restored with a complete

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veneer gold crown for orthodontic treatment. Conservative restorations existed on other teeth (Figs 1–5).

Occlusal Findings

The patient had a Class I canine relationship bilaterally, and centric relation was coincident with maximum intercuspation position. A shared anterior guidance in protrusive and canine guidance in lateral excursions provided a mutually protected occlusion for the existing restorations.

Radiographic Findings

The trabecular pattern of the bone was generally normal. Tooth #13 was status post-endodontic treatment, and the existing dowel was very short. The crown-to-root ratio ranged from 1:1.5 to 1:2. There was no evidence of radiographic pathology.

Diagnosis

1. The patient presented as an ACP Prosthodontic Diagnostic Index (PDI) Partially Edentulous Classification III.[1]
2. She was in good health and had no medical contraindications to prosthodontic treatment.
3. The patient was partially edentulous in both the maxilla and mandible.
4. She had generalized mild gingivitis with fair to poor oral hygiene.
5. Endodontic consultation confirmed tooth #13 needed re-treatment.
6. The patient had a broken margin on the amalgam restoration in tooth #28.
7. A small diastema existed between #8 and 9, with spacing between #11 and 13.
8. The patient had an open margin FPD #3–6.
9. The patient exhibited a "philosophical personality" according to House's classification. [2]

Treatment Plan

The following treatment plan was based upon clinical findings, articulated diagnostic casts, diagnostic waxing, radiographic examination, and periodontic and endodontic consultations.

1. Oral and written presentation and discussion of the treatment plan, including risks, alternatives, and benefits of treatment were made to the patient. She refused treatment plans that involved the use of any dental implant restorations. Her consent for treatment was obtained for the planned FPDs and RPDs.
2. The patient received oral hygiene instruction and an oral prophylaxis.
3. The amalgam restoration in tooth # 28 would be replaced.
4. Replacement of FPD #3–6 with replacement of substructure restorations as needed.
5. Tooth #13 re-treated endodontically if required, and restored with a cast dowel and core and metal ceramic crown.
6. Maxillary and mandibular RPDs. The small torus palatinus would not interfere with the planned anterior posterior palatal bar connector.
7. A maxillary hard acrylic occlusal splint would be constructed after completion of the restorative phase of therapy to protect the restorations and to function as an orthodontic retainer.

Treatment Sequence

1. Two sets of preliminary casts were made using poly(vinyl siloxane) impression material (Examix light body and medium body impression material, GC America, Alsip, IL) and poured in improved dental stone (Silky Rock, Whip Mix, Louisville, KY) for records and treatment planning. The maxillary casts were articulated on a Whip Mix articulator model 8300 using an arbitrary face bow (Whip Mix). The mandibular casts were articulated using a wax occlusal record in centric relation. The maxillary and mandibular casts were surveyed and designed for RPDs. A diagnostic waxing was made on one set of articulated diagnostic casts.
2. Patient received oral prophylaxis and oral hygiene instructions. Proper tooth brushing and flossing were re-emphasized. The shades for both porcelain and prosthetic denture teeth were selected.
3. The broken amalgam restoration on tooth #28 was replaced.
4. The FPD #3–6 was removed to evaluate the substructure of the abutment teeth. Caries

was discovered on abutments #3 and 6. Caries was excavated, and amalgam restorations placed in both abutments. Abutment #4 did not have sufficient tooth structure remaining for a core build-up. Thus, endodontic treatment and a dowel and core were discussed with the patient, and her approval for these added restorations was obtained. Crown #13 was removed, and provisional restorations were constructed for #3–6 and #13 and cemented with provisional cement (Temp Bond, Kerr, Italia, S.P.A).

5. Cingulum rest seats and guide planes were prepared on #22 and 27, and a mesial-occlusal rest on #20. Crown #21 was slightly modified for proper path of insertion of the RPD. A final impression for the mandibular RPD framework was made with poly(vinyl siloxane) impression material (Examix light body and medium body impression material) and poured in Type IV stone (Silky Rock). The patient continued wearing her orthodontic retainers.
6. Endodontic treatment and retreatment on teeth #4 and #13, respectively, was performed by a graduate endodontics resident.
7. The mandibular RPD framework (Ticonium, Ticonium Company, Albany, NY) was constructed and tried in, occlusion was adjusted, and prosthetic teeth were set.
8. Teeth #4 and 13 were prepared for custom cast metal post and cores. The post and cores (Harmony, Williams, Amherst, NY) were fabricated and permanently cemented with zinc phosphate cement (Mizzy, Inc., Cherry Hill, NJ). An altered cast impression of the mandibular right distal extension edentulous area was made with ZOE impression material (Krex, Teledyne Dental, Los Angeles, CA) and transferred to the master cast.
9. Tooth preparations on #3, 4, 6, and 13 were finalized (Fig 6). Occlusal reductions were verified using the plane of occlusion of the provisional setup of the mandibular RPD. Final impressions for teeth #3–6 and crown #13 were made with poly(vinyl siloxane) impression material (Examix: light body and medium body impression material). Provisional restorations were fabricated and cemented with ZOE (Temp Bond).
10. The master casts were poured in type IV stone (Prima Rock, Whip Mix) and coated with die hardener (Yeti, Engen, Germany). The maxillary master cast was articulated on the Whip Mix articulator model 8300 using an arbitrary face bow. The mandibular master cast was articulated using the clinically obtained intraocclusal registration record.
11. Survey metal ceramic crown #13 and FPD #3–6 were constructed (WillCeram Y, Williams). Teeth #5 and 6 were designed for a double embrasure clasp, and #6 had a cingulum rest placed. The survey crown on #13 was made for a twin-flex clasp[3-5] with a mesial occlusal rest. The crown and FPD were trial-seated and adjusted to evaluate fit, proximal contacts, and occlusion. When completed, they were luted with Zinc phosphate cement (Mizzy, Inc.) (Figs 7, 8).
12. Cingulum rests were prepared on teeth #7 and 11. A final impression for the maxillary RPD was made with poly(vinyl siloxane) impression material.
13. Three maxillary casts were poured in type IV stone (Silky Rock). The first cast served as the master cast for construction of the RPD framework. The second cast served as the design cast, which was surveyed, and the RPD design was drawn. Tripod marks were made on both master and design casts. The third cast was used for the fabrication of an occlusal splint. The hard acrylic occlusal splint was made using heat-polymerized clear acrylic resin (Lucitone Clear Resin, Dentsply International, York, PA) and delivered. The patient continued wearing the mandibular orthodontic retainer.
14. The maxillary RPD framework was constructed (Ticonium) and trial-inserted, and the occlusion was adjusted. Prosthetic denture teeth (Trublend, Dentsply International) were set up for maxillary and mandibular RPDs, festooned, and then inserted to evaluate esthetics, phonetics, and occlusion (Fig 9).
15. The maxillary and mandibular RPDs were processed using heat-polymerized acrylic resin (Lucitone 199, Dentsply International) and delivered. Home care instruction was given to the patient (Figs 10–14).
16. Post-delivery instructions were provided and reviewed with the patient.

Figure 1. Maxillary arch, pre-treatment, occlusal view.

Figure 2. Mandibular arch, pre-treatment, occlusal view.

Figure 3. Teeth in maximum intercuspation, pre-treatment, frontal view.

Figure 4. Teeth in maximum intercuspation, pre-treatment, right lateral view.

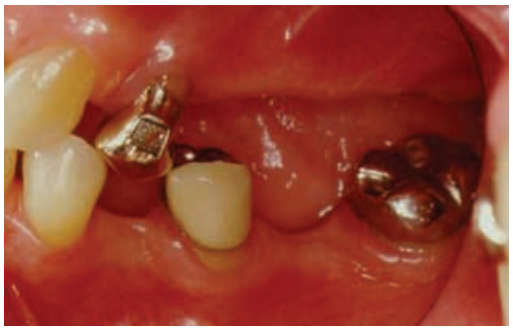

Figure 5. Teeth in maximum intercuspation, pre-treatment, left lateral view.

Figure 6. Maxillary arch, teeth preparation, occlusal view.

Figure7. Maxillary arch, post-treatment, occlusal view.

Figure 8. Mandibular arch, post-treatment, occlusal view.

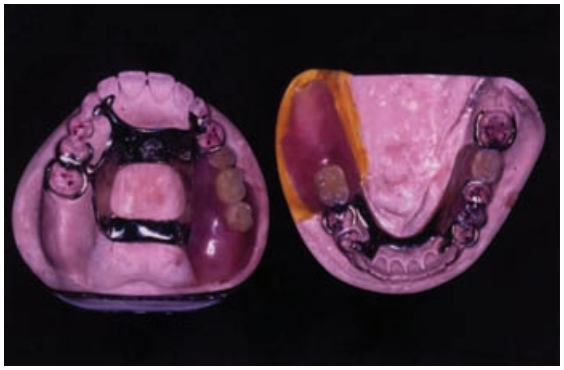

Figure 9. Waxed upper and lower RPDs, occlusal view.

Figure 10. Maxillary arch, post-treatment with RPD, occlusal view.

Figure 11. Mandibular arch, post-treatment with RPD, occlusal view.

Posr-Treatment Therapy

The patient called 24 hours following delivery and stated that she did not have any problems with either removable prosthesis. At the 1-week follow-up appointment, the patient stated that she had no problems with the prostheses, and there were no signs of tissue irritation. She was placed on a 6-month recall schedule.

Figure 12. Teeth in maximum intercuspation with RPD, post-treatment, frontal view.

Figure 13. Teeth in maximum intercuspation with RPD, post-treatment, right lateral view.

Figure 14. Teeth in maximum intercuspation with RPD, post-treatment, left lateral view.

Prognosis

The patient was very motivated and dedicated to restoring her oral health to optimal condition. Her positive attitude and improved oral hygiene should help ensure a favorable prognosis for successful prosthodontic treatment. Long-term prognosis will depend on consistent and continued good oral

hygiene practice and wearing the occlusal splint and mandibular orthodontic retainer.

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