

A procedure for repairing a fixed implant-supported complete denture

Bill Abbo, DDS,^a and Michael E. Razzoog, DDS, MS, MPH^b
University of Michigan, Ann Arbor, Mich

One of the reconstructive choices for the completely edentulous patient is the placement of multiple implants and the fabrication of a fixed implant-supported complete denture. These patients experience an improvement in masticatory performance over patients who wear complete dentures.¹⁻⁶

The fixed-implant complete denture consists of a metal bar with acrylic resin and denture teeth connected to implants by means of prosthetic retaining screws. Another method of completing the prosthesis is to apply porcelain to finalize the gingival and tooth structures. The original concept called for the metal bar to be waxed and cast in a gold alloy.⁷ Several manufacturers now offer a metal bar of titanium, either welded or milled from a single block. During fabrication of the denture, the metal must be treated with a bonding agent and a gingival-colored opaque material prior to the acrylic resin processing.⁸ This is done to enhance the adherence of the acrylic resin to the metal and to mask the dark metal color.

While such restorations provide comfort, function, and esthetics to levels that may not be obtainable with a conventional denture, maintenance and occasional repair are required. When fracture of porcelain or acrylic occurs, exposing the metal, the required repair may be complicated and expensive due to the need to remove the remaining material and reapply it to the framework. This article describes an alternative method of repairing the fixed-implant complete denture without replacing the entire gingival portion of the prosthesis. The patient described here presented with a fractured mandibular screw-retained fixed implant-supported complete denture. The fracture extended through the artificial teeth and gingival acrylic resin on the right side, leaving the titanium bar exposed (Fig. 1). Using this technique, there may be a color mismatch between the acrylic resin and the resin composite that might be of concern in some situations. However, with the increasing use of titanium rather than gold alloy for the fabrication of the metal substructure, the need for maintenance and repair is likely to increase.



Fig. 1. Fractured fixed-implant complete denture.



Fig. 2. Completed repair.

PROCEDURE

1. Airborne-particle-abrade the surface of the substructure to be repaired with nonrecycled aluminum oxide (50 μm at 50 psi; K C Abrasive, Kansas City, Kan) and apply a thin layer of metal adhesive primer (Metal Primer II; GC America, Alsip, Ill).
2. Apply 2 separate layers of opaque microfilled resin composite (Gradia Indirect; GC America) and light-polymerize for 30 seconds in the supplied light chamber to mask the metal color.
3. Add microfilled resin composite (Gradia Indirect GUM; GC America) incrementally to reproduce the gingival morphology, and light-polymerize in the supplied light chamber for 30 seconds.

^aGraduate student, Biologic and Materials Science, Division of Prosthodontics.

^bProfessor of Dentistry, Biologic and Materials Science, Division of Prosthodontics.

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4. Fabricate artificial replacement teeth using appropriate dentin shades of microfilled resin composite followed by a layer of enamel microfilled resin composite. Coat the surface with an air-barrier coating (GC Lab Technologies) to eliminate the air-inhibition layer and to ensure complete polymerization.
5. Shape the desired tooth anatomy and occlusion, and polish (Shofu CompoMaster; Shofu Dental, San Marcos Calif) to complete the repair (Fig. 2).
6. Secure the fixed implant-supported complete denture to the abutments and verify the appropriate occlusal contacts.
7. Seal the screw access openings with cotton and resin composite of choice.

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Reprint requests to:

DR BILL ABBO
715 SOUTH FOREST AVE., APT #203
ANN ARBOR, MI 48104
FAX 734-763-3453
E-MAIL: abbovan@umich.edu

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