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TIPS FROM OUR READERS

Reinforcement of an interim fixed prosthesis with a denture metal mesh

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Long-term interim fixed prostheses play a critical role in the success of extensive prosthodontic rehabilitations. They allow assessment of esthetics, phonetics, masticatory function, newly established vertical dimension of occlusion, and proper occlusal scheme before fabrication of the definitive restorations. Furthermore, fixed interim restorations protect implants or tissue grafts during the osseointegration phase.[1]

Fracture is the most common problem associated with interim fixed prostheses, especially in patients with parafunctional habits or in long span restorations. Repairing and replacing fractured interim restorations is inconvenient because of the additional cost and time associated with these complications.[2] Techniques and materials for reinforcement of interim restorations have been reported, including metal wires, stainless steel orthodontic bands,[3] lingually placed metal castings,[4] and heat-processed acrylic resin with cast metal reinforcement,[5] in addition to different types of fibers such as plasma-treated woven polyethylene 6 and silane-impregnated glass,[7,8] and silica nanoparticles reinforcement.[9] However, they are relatively expensive and may require additional laboratory procedures that increase the complexity of fabricating the interim restoration.

This article describes a straightforward, cost-effective, chairside technique for fabrication of reinforced interim fixed prosthesis with an embedded denture metal mesh, as used to increase the fracture resistance of maxillary complete dentures.[10] The mesh is made of interlaced wire structure that provides resin interlocking and micromechanical retention; therefore, it can be used with different types of materials including polymethyl methacrylate (PMMA) and bis-acryl resins. In addition, it increases the fracture toughness of the prosthesis by resisting occlusal forces and crack propagation.[10] Moreover, it prevents catastrophic failure and complete separation of segments, leaving a fractured restoration connected. This technique is indicated for posterior interim fixed prostheses, where esthetics are not of a major concern.

The procedure is illustrated for a patient with a history of parafunctional habits and a complete-mouth rehabilitation with an increased occlusal vertical dimension. The complete-arch interim restorations were made in 3

Figure 1. Prepared abutment teeth providing 1.5-2.0 mm occlusal clearance at increased occlusal vertical dimension.

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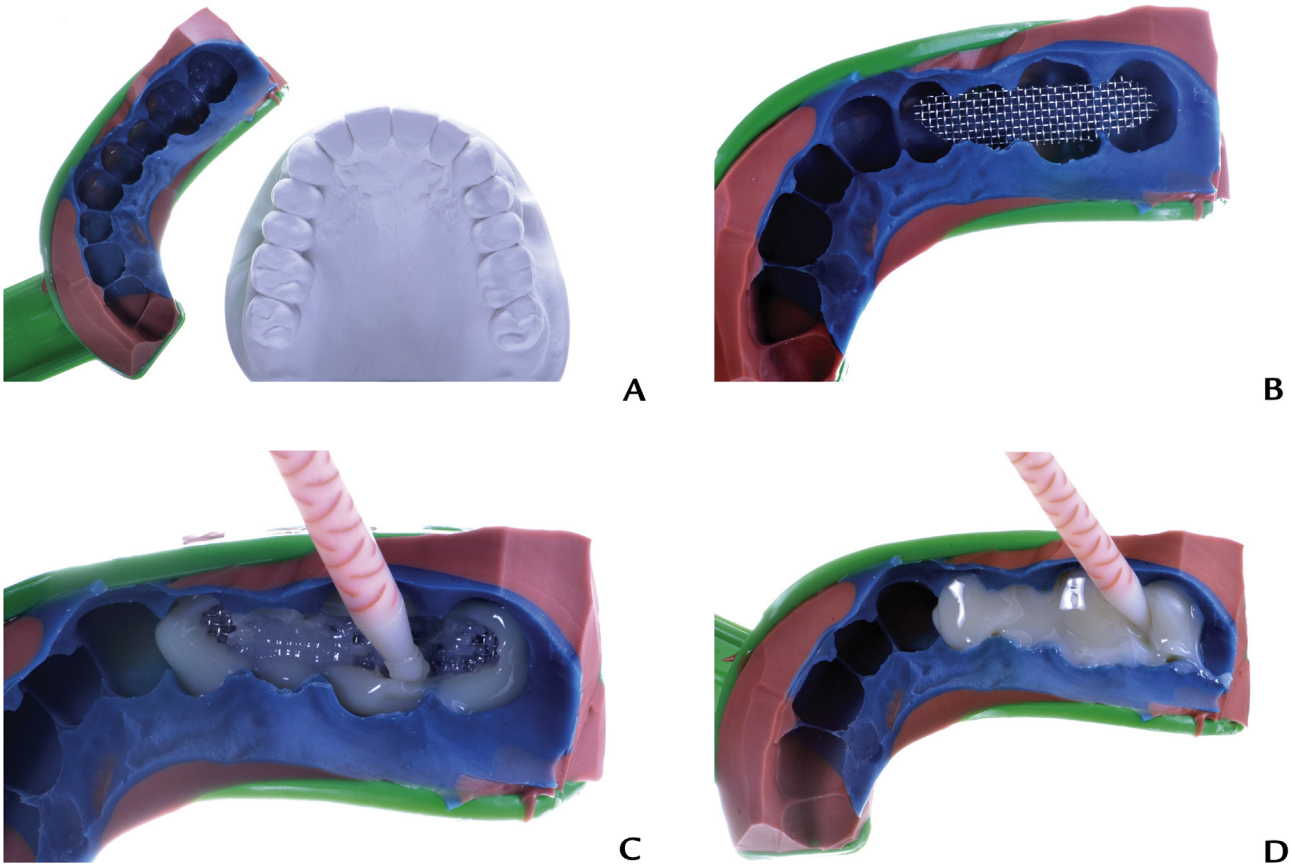

Figure 2. A, Matrix made on duplicate cast of diagnostic waxing. B, Adjusted mesh placed into matrix. C, Mesh seated into single layer of bis-acryl resin in matrix. D, Matrix filled with bis-acryl resin.

segments. The posterior right segment was delivered as an interim fixed partial denture from second molar to first premolar with the second premolar as a pontic. The prepared abutment teeth provided 1.5 to 2.0 mm occlusal clearance (Fig. 1). The thickness of the metal mesh used is about 0.5 mm.

TECHNIQUE

1. Make a matrix for the quadrant to be treated with polyvinyl siloxane impression material (Aquasil Ultra Xtra and Reprosil Quixx Putty; Dentsply Sirona) with the putty and wash impression technique on a duplicate cast of the diagnostic waxing. Include the adjacent teeth in the impression to reposition the matrix accurately (Fig. 2A).
3. Measure the mesiodistal and the buccolingual span length of the teeth to be restored. Cut a small piece of the stainless-steel wire mesh (Wire Mesh, Stainless Steel, Medium-Fine, 6" x 6"; Keystone Industries) with sharp scissors. Trim the mesh to fit into the occlusal portion of the matrix and to extend across the occlusal surfaces of all abutment teeth, including the pontic, thus

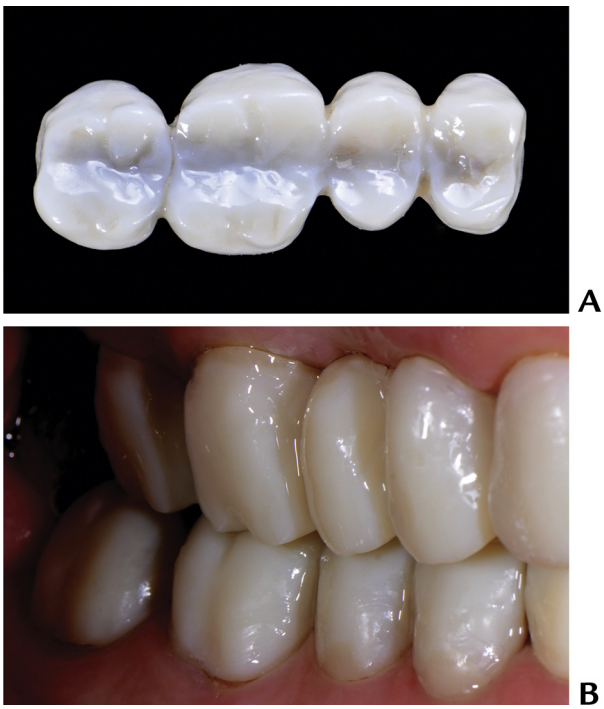

Figure 3. A, Finished and polished interim prosthesis. B, Cemented mesh-reinforced interim fixed prosthesis.

reinforcing the entire span of the interim prosthesis (Fig. 2B).

4. Block out undercuts on adjacent teeth with wax. Dispense a single layer of bis-acryl resin (Protemp Plus; 3M) into the matrix and then quickly seat the mesh into the bis-acryl resin (Fig. 2C). It is essential to have the mesh seated into the occlusal portion of the matrix to avoid the possibility of exposure on the buccal or lingual surfaces. If the mesh is attached intraorally to the occlusal surface of the abutment teeth, the matrix might displace the mesh during seating.
5. Fill the remaining of the matrix with bis-acryl resin and seat it intraorally over the prepared teeth (Fig. 2D). Remove the matrix from the mouth after the initial polymerization and allow for complete polymerization following the manufacturer's instructions.
6. Finish and polish the interim prosthesis. If the metal edges are exposed in the interproximal embrasures of the prosthesis, trim the edges with an E-cutter carbide bur (H261E.11.023 HP; Brasseler USA), and then, overlay with flowable composite (Filtek Supreme Ultra; 3M) to mask the metal display (Fig. 3A).
7. Cement the interim prosthesis with an interim luting agent (Cling2; Clinician's Choice), following the conventional technique (Fig. 3B).

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