

Indirect fabrication of multiple post-and-core patterns with a vinyl polysiloxane matrix

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In the described technique, a vinyl polysiloxane material is used as a matrix for the indirect fabrication of multiple custom-cast posts and cores. The matrix technique enables the clinician to fabricate multiple posts and cores in a short period of time. The form, harmony, and common axis of preparation for all cores are well controlled before the definitive crown/ fixed partial denture restorations are fabricated. Oral tissues are not exposed to the heat of polymerization or the excess monomer of the resin material when this technique is used. (J Prosthet Dent 2002;88:555-7.)

Endodontically treated teeth require some form of restoration, which can range from a simple restoration of the endodontic access opening to a cast post and core and complete-coverage restoration, depending on the amount of remaining coronal tooth structure.^{1,2} A post-and-core pattern is indicated to restore endodontically treated anterior teeth when most of the tooth structure has been lost.^{1,2} Different techniques for the fabrication of single and multiple posts and cores have been described. Several authors have suggested the use of a vacuum-formed matrix for the direct fabrication of multiple custom-cast post-and-core patterns.³⁻⁶ The use of vinyl polysiloxane and polyether occlusal registration materials for the fabrication of single and multiple composite cores also has been documented.⁷ Livaditis⁷ advocated these materials because of their ability to accurately register the margins of the gingival tissues and sulcular area. The materials are semirigid after polymerization, so they resist distortion when filled with resin and seated in place. The rigid nature of these impression materials relative to other elastomers facilitates trimming and carving.⁷

This article describes the use of a vinyl polysiloxane occlusal registration material as a matrix for the indirect fabrication of multiple custom-cast posts and cores for extensively damaged, endodontically treated maxillary anterior teeth.

TECHNIQUE

1. Make an irreversible hydrocolloid impression (Jeltrate; Dentsply Caulk, Milford, Del.) where custom-cast posts and cores are indicated (Fig. 1, A). Pour the impression to obtain a stone cast (Yellow Stone; Whip Mix Corp, Louisville, Ky.).
2. Prepare all endodontically treated teeth on the stone cast to receive metal-ceramic crowns (Fig. 1, B).
3. Mix vinyl polysiloxane occlusal registration material (3M Express; 3M Dental Products, St. Paul, Minn.) according to the manufacturer's direc-



Fig. 1. A, Weakened endodontically treated maxillary anterior teeth with defective restorations. B, Metal-ceramic preparation of maxillary anterior teeth on stone cast.

tions, and position it over the prepared teeth on the stone cast. Cover all axial surfaces (Fig. 2) and extend the material onto adjacent unprepared teeth.

4. After the material polymerizes, remove it from the stone cast, and trim with a scalpel 1 tooth beyond the prepared teeth. Leave the finish lines of preparations within the material intact.
5. Make small holes at the incisal surfaces of the index for escape of excess material.

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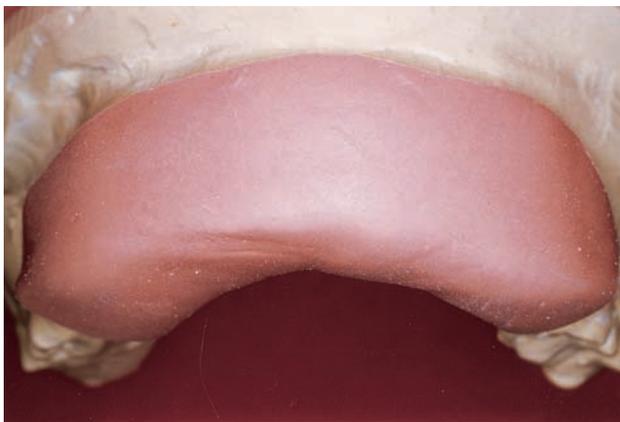


Fig. 2. Vinyl polysiloxane material seated over prepared teeth on stone cast.



Fig. 3. Radicular and coronal portions of teeth prepared for custom-cast posts and cores and metal-ceramic restorations.



Fig. 4. Plastic posts fitted and coated with autopolymerizing acrylic resin.

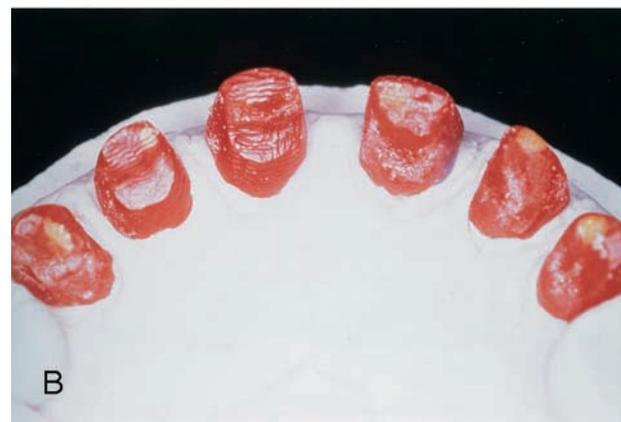
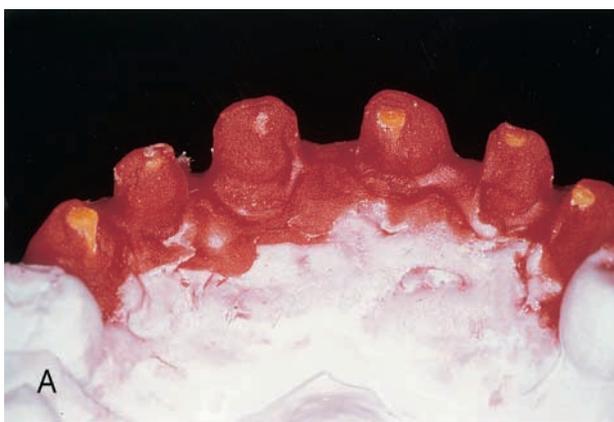


Fig. 5. A, Posts and cores immediately after removal of index material. **B,** Refined posts and cores.

6. Prepare the radicular and coronal portions of each tooth to receive custom-cast posts and cores and metal-ceramic restorations (Fig. 3).
7. Make an impression (3M Express; 3M Dental Products) of the radicular and coronal portions of all prepared teeth. Pour the impression in a high-strength stone (Die Keen; Heraeus Kulzer Inc, South Bend, Ind.). Apply a layer of lubricant (Duralay Lubricant; Reliance Dental Mfg Co, Worth, Ill.) to the working areas of the cast.
8. Select and fit appropriately sized plastic posts (Para-Post; Whaledent Int, New York, N.Y.) in the prepared canals. Adjust their length so that they do not interfere with proper positioning of the matrix.
9. Mix an autopolymerizing acrylic resin material (Duralay; Reliance Dental Mfg Co), and lightly coat the coronal part of the plastic posts (Fig. 4). Remove excess resin material before complete polymerization.
10. Mix an autopolymerizing acrylic resin material. Fill the vinyl polysiloxane matrix, and place it over the teeth with the adapted plastic posts properly posi-

tioned inside the canals on the cast. Immediately remove any excess core material extruding through the incisal holes. Stabilize the matrix until the core material completely polymerizes.

11. Remove the matrix, and refine the cores (Fig. 5).
12. Invest the post-and-core patterns, and cast them with the metal of choice. Adjust the castings intraorally. Lute (Fleck's; Mizzy Inc, Clifton Forge,



Fig. 6. Luted cast posts and cores.

Va.) the posts and cores with conventional techniques (Fig. 6).

13. Fabricate the definitive restorations.

SUMMARY

The direct fabrication of a cast post and core for an endodontically treated tooth requires a long clinical appointment; this is especially true when multiple posts and cores are needed. The indirect method of fabrication offers several advantages, one of which is a considerable reduction in chair time. In the described technique, a vinyl polysiloxane matrix is used for the indirect

fabrication of multiple post-and-core patterns. The matrix enables placement of the resin material under pressure, which may minimize gaps and voids in the core portion.⁷

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0022-3913/2002/\$35.00 + 0 10/1/129382

doi:10.1067/mpr.2002.129382

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