

Simplified technique for refabrication of cast posts and cores

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This article describes a simple procedure of recording contours of an existing cast post and core that needs to be reconstructed, using a polyvinyl siloxane material as a matrix for fabrication of a new cast post and core in a relatively short time with reduced cost. The procedure involves the use of an acrylic resin material under pressure, which minimizes void formation in the post-and-core pattern. (*J Prosthet Dent* 2000;83:686-7.)

In some clinical situations, the clinician may be satisfied with the axial and occlusal contours of a cast post and core, but not with the degree of the post fit or marginal adaptation to tooth structure. The usual solution to this problem is to fabricate a new post and core. Several authors have suggested refabrication of the post and core using an existing crown or a fixed partial denture retainer.¹⁻⁴ If such restorations are not available, rebuilding a new post and core will require additional chair time.

This article describes a procedure that involves replication of an existing cast post and core with polyvinyl siloxane as a matrix to fabricate a resin pattern for a new cast post and core in a relatively short time.

PROCEDURE

1. Seat the existing defective metal cast post and core that has an acceptable core contours.
2. Mix polyvinyl siloxane material (3M Express Est, 3M Dental Products, St Paul, Minn.) according to the manufacturer's directions, then position it over the cast post and core so that it extends onto adjacent teeth and covers all axial surfaces of the cast post and core.
3. After the material polymerizes, remove and trim it with a scalpel at areas contacting gingival tissues (Fig. 1). (The matrix is ready to be used for fabrication of a new cast post and core.) Remove the defective cast post and core.
4. Select an appropriate size plastic post (Para-Post, Whaledent International, New York, N.Y.) and insert it into the prepared root canal. Adjust the length of the post so it does not interfere with the matrix material. Apply a layer of lubricant to the tooth structure. Coat the coronal part of the post with an autopolymerizing acrylic resin material (Duralay, Reliance Dental Mfg Co, Alsip, Ill.) to ensure better adaptation to the tooth structure. Allow it to set (Fig. 2).

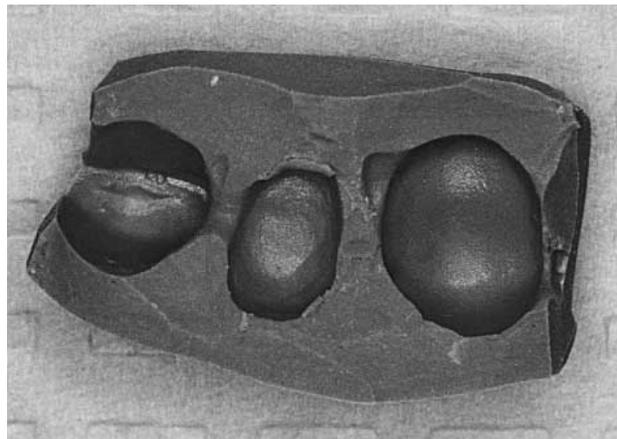


Fig. 1. Trimmed polyvinyl siloxane matrix material covering existing cast post and core and adjacent teeth.



Fig. 2. Plastic post fitted and coated with Duralay material.

5. Mix the acrylic resin material and fill the polyvinyl siloxane matrix, then place it over the plastic post. Apply finger pressure on the matrix over the adjacent teeth to index its positioning.
6. Hold the matrix until the resin material completely polymerizes then remove it. Check the refabricated Duralay post and core and make sure that

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Fig. 3. Occlusal view of refabricated Duralay post and core immediately after removal of matrix. Reproduced contour of previously existing cast post and core demonstrates no deficiency of material.



Fig. 4. Refined Duralay post and core.

there is no deficiency of the material and that the contour of the previous cast post and core is reproduced (Fig. 3).

7. Refine the post and core (Fig. 4), then send it to the laboratory to be cast in metal.

DISCUSSION

The procedure described in this article will allow the clinician to record and replicate the desirable contours of an existing cast post and core that needs to be refabricated. The advantages of this procedure are reduced chairside time and reduced cost. The additional advantage of placement of the Duralay acrylic resin material under pressure applied on the matrix minimizes voids and gaps in the post-and-core pattern. The heat of polymerization of the acrylic resin material is unavoidable, but can be minimized by using a quantity that is needed for building up the core with minimal contact with the gingival tissues.

Acrylic resin materials undergo volumetric contraction (shrinkage) during the polymerization process. One study reported that 80% of all the shrinkage of Duralay resin occurs before 17 minutes and 95% before 3 hours at room temperature.⁵ In addition, they found high polymerization shrinkage as a result of a high monomer/polymer ratio⁵ and suggested to use a mix as thick as possible to minimize the worst effects of polymerization.

In this article, Duralay resin was used in a thick consistency as was recommended and the excessive use of

monomer was avoided as much as possible. No attempt was made to let the Duralay pattern set for several hours then refit it because, as previously mentioned, most of the shrinkage of Duralay resin (80%) is expected before 17 minutes. Because the fabrication of a Duralay resin pattern may take more than 17 minutes, allowing it to set for several hours and refitting may not be necessary.

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