# Fiber-reinforced post and core adapted to a previous metal ceramic crown

**Miguel A. Iglesia-Puig, DDS, MS,[a] and Alfonso Arellano-Cabornero, DDS, MS[b]**
Zaragoza, Spain; School of Dentistry, University of the Basque Country, Bilbao, Spain

**A technique to create a fiber-reinforced anatomic post and core adapted to an existing crown is described. This technique is performed with a quartz post adapted to root canal anatomy, using a core composite material. With this technique, a well-adapted anatomic post and core may be achieved in a clinical session.** (J Prosthet Dent 2004;91:191-4.)

The restoration of an endodontically treated tooth with significant loss of tooth structure is often achieved using a post and core. A growing interest in esthetic dental restorations and adhesive dentistry has led to the development of innovative post materials and techniques for the esthetic restoration of endodontically treated teeth. These newer systems have focused on physical properties, such as modulus of elasticity (rigidity), that are more closely matched to dentin to decrease stress concentrations within the root canal and reduce the incidence of fractures.[1-4] Another advantage is in endodontic retreatment, as most fiber posts can be removed from a root canal with ease and predictability, when necessary, without compromising core retention.[2]

Quartz fiber posts have been reported to possess higher resistance to fracture than other fiber posts.[4,5] The use of translucent quartz fiber posts may enhance esthetics in the definitive restoration and may also be useful in the polymerizing process by transmitting light energy through the post.[2,6]

Post adaptation to the canal walls also represents an important element in the biomechanical performance of the restoration.[7] A double-taper post system (DT Light-Post; RTD, Saint Egrève, France) made of quartz fiber and epoxy resin was developed to conform closely to the shape of the endodontically treated root canal. Benefits of this post system include minimal tooth structure removal during canal reshaping, greater post-to-canal adaptation in the apical and coronal half of the canal, and good post retention.[7] The use of a quartz fiber or epoxy material with a lower modulus of elasticity also may reduce the incidence of root fracture.[7] The use of bondable materials allows the practitioner to unify the structure and morphology of root systems.[8] A technique to create a fiber-reinforced anatomic post and core adapted to a previous crown is presented.

A 48-year-old man presented with a carious lesion in the maxillary right first premolar that was previously endodontically treated and restored with a metal ceramic crown. The large carious lesion had completely undermined the tooth, causing debonding of the restoration (Fig. 1).

**Fig. 1.** Pre-operative view of maxillary first left premolar with crown dislodged. Note preservation of margins.

The margins of the preparation were preserved and allowed for reuse of the previous crown. Since the patient had significant time restraints, a single appointment treatment approach was presented, which the patient accepted. The treatment plan consisted of adapting the existing crown to the remaining tooth structure and creating an anatomic fiber-reinforced post and core (APC). A post and core system (Anatomic Post'n Core, RTD) (Fig. 2), composed of a translucent radiopaque quartz fiber post with an epoxy resin matrix (DT Light-

[a]Private practice, Zaragoza, Spain.
[b]Professor of Dental Pathology and Therapeutics, School of Dentistry, University of the Basque Country, Bilbao, Spain.

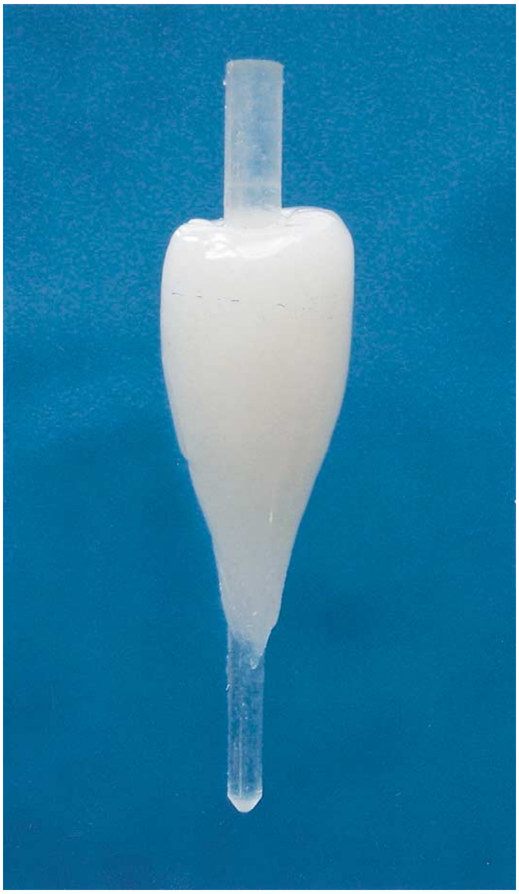

**Fig. 2.** Anatomic Post'n Core material prior to use.

**Fig. 3.** Completed post and core.

**Fig. 4.** Anatomic Post'n Core adapted to previous crown (mirror view).

post, RTD) combined with a composite core material for a restoration in one appointment (APC Core, RTD) was used.

## TECHNIQUE

1. Remove the caries and prepare the root canals with low-speed calibrated burs (APC Universal and Finishing Drill; RTD) to allow the placement of the post.
2. Insert the APC in the root canal, placing the post with unpolymerized composite (Anatomic Post'n Core; RTD) into the root canal, impregnated with a neutral glycerin gel (APC Lubricate; RTD). Apply light pressure to adapt the post to root canal anatomy, using the core composite (APC Core; RTD). Light-polymerize for 20 seconds with a halogen light (Optilux 500; Demetron/Kerr, Orange, Calif) through the quartz-fiber post by placing the light-tip onto the post. Remove the post and complete the polymerization of the APC extraorally for 40 seconds.
3. Clean the existing crown of any debris.
4. Insert the APC into the root canal to establish the proper height of the post to allow for complete crown seating. Cut the post 2 mm shorter than the height of the crown to allow for the placement of the composite core. Prepare the crown foundation by

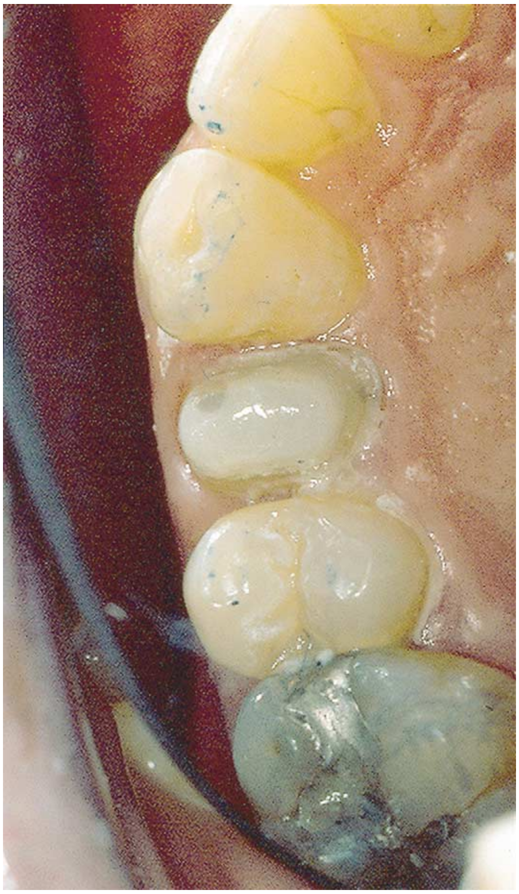

**Fig. 5.** Occlusal view of Anatomic Post'n Core.

**Fig. 6.** Facial view of Anatomic Post'n Core.

**Fig. 7.** Postoperative view with previous crown luted in position.

adding the core composite provided with the system, evaluating it continuously so that proper seating of the crown is maintained (Fig. 3). Accomplish the final adaptation of the APC core to the previous crown by impregnating the intaglio surface of the crown with neutral glycerin gel (APC Lubricate; RTD) and filling it with the core composite. Place it carefully onto the preparation with the APC in place. Remove the entire APC assembly, along with the previous crown, and complete the extraoral polymerization for an additional 40 seconds using the same light (Fig. 4).

5. Clean the canal with paper points, rinse with water, and dry with air. Apply a dual-polymerizing dentin adhesive (Excite DCS; Ivoclar Vivadent, Amherst, NY) to both the root canal and the APC. Lute the post and core with a dual-polymerizing resin luting agent (Variolink II; Ivoclar Vivadent) placed in a thin layer by spinning the luting agent into the canal with an endodontic file. Seat the APC and light-polymerize for 10 seconds through the translucent post and core material. Remove excess cement. Complete the polymerization for an additional 40 seconds (Figs. 5 and 6).
6. Lute the crown by placing it onto the luted APC, using the previously described procedure (Fig. 7).

## SUMMARY

The fiber-reinforced anatomic post and core may be used to readapt a dislodged crown. The use of translucent quartz posts and core composites allows the clinician to quickly create an APC that is well adapted to canal root preparation and to the previous crown, provided the crown margins are intact.

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*Reprint requests to:*
Dr. Miguel A. Iglesia-Puig
Clínica Bucodental MAIP
Residencial Paraíso 1, esc. B, 1C
50008 Zaragoza
SPAIN
Fax: 34-976-233448
E-mail: driglesia@clinicamaip.net

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## Noteworthy Abstracts of the Current Literature

**Maintenance requirements of implant-supported fixed prostheses opposed by implant-supported fixed prostheses, natural teeth, or complete dentures: A 5-year retrospective study.**
Davis DM, Packer ME, Watson RM. *Int J Prosthodont* 2003; 16:521-3.

**Purpose.** The purpose of this study was to compare the maintenance requirements of implant-supported fixed prostheses with cantilever arms in edentulous jaws when opposed by fixed prostheses of similar design, by natural teeth, or by complete dentures.
**Materials and Methods.** The maintenance requirements for the 5-year follow-up period were obtained by examining the dental records of 37 people. Six were provided with fixed prostheses in both arches, 22 with a fixed prosthesis in the mandible opposed by a complete denture, and 9 with a fixed prosthesis opposed by natural teeth. Everyone was treated with Nobel Biocare implants using standard implant and prosthetic protocols.
**Results.** The denture teeth and acrylic resin were repaired on 44 occasions in the group with implants in both jaws, on 14 occasions in the group with implants opposed by natural teeth, and twice in the group in which the implants were opposed by a complete denture. The group with implants in both jaws was more likely to fracture the gold-alloy framework, which occurred on six occasions. The group with implants in both jaws was significantly different from the other two groups in relation to higher incidence of fracture of the teeth and gold-alloy framework.
**Conclusion.** The maintenance requirements of implant-supported fixed prostheses with cantilever arms opposed by fixed prostheses of similar design were much greater than when opposed by natural teeth or complete dentures.—*Reprinted with permission of Quintessence Publishing*