Crowning a Winner

Retrofitting a crown on a compromised endodontic-treated tooth

Introduction

A dislodged anterior crown with an endodontic post needs immediate replacement. Retrofitting and cementation of the existing crown will save the patient time and money. This case report demonstrates a precise method for readapting an existing crown on a tooth with an inadequate circumferential ferrule.

Case report

A 62-year-old male complained of tooth mobility; a clinical examination revealed that the crown on #6 became dislodged along the fractured fiber post (Fig. 1). The X-ray confirmed the root canal was intact and once the crown was removed the remaining tooth structure also appeared intact (Fig. 2). The decision was made to rebond the crown.

I removed the remaining restorative material and made an opening through the lingual surface to facilitate the insertion of the anatomic fiber post (Fig. 3)—a tapered one (DT Light Illusion X-RO from Bisco), because parallel fiber posts require removal of sound radicular dentine, which creates sharper internal angles that may result in a weakened root and a higher fracture risk. The post would be bonded through the crown after it had been adhesively cemented.

After rubber dam isolation, no additional dentin should be removed. I placed an UltraPak retraction cord (Ultradent) and cleaned the canal with alcohol, then 2% chlorhexidine Cavity Cleanser (Bisco) before trying on the crown for fit evaluation. I sandblasted the remaining tooth structure using MicroEtcher (Danville Materials), then used Kerr’s Také1 Light Body PVS material to fill the endodontic access and prevent residual restorative material from entering. I applied Select HB Etch (Bisco), a 35% phosphoric acid solution, to the residual structure for 15 seconds, then rinsed and rewet with 2% chlorhexidine (Fig. 4) before using Optibond FL etch-and-rinse adhesive (Kerr). I applied multiple layers of primer (Fig. 5, p. 30), followed by a thin layer of adhesive agent and light curing (Fig. 6, p. 30).

A note from the editor:

Last October we introduced a new department called “Show Your Work” that gives Townies another opportunity to do just that. Here, you’ll find straightforward case studies that your fellow dentists take pride in.

Maybe they feel like they’ve finally mastered a new technique they’ve been working on. Perhaps they rose to the challenge of a particularly tough patient case. Or it could be that they just want bragging rights for something that, in their eyes, approaches perfection.

If you’ve got a case you think might be a great fit, shoot me an email: sam@farranmedia.com. Be sure to include a sentence that sums up why this case is so special to you, to help us review and select the best contenders for publication.

One last clarification: This opportunity is available to registered Townies only! So be sure to update your member information at Dentaltown.com before giving us a shout.

Thank you!

Sam Mittelsteadt
I etched the intaglio of the crown with 5% hydrofluoric acid from Ivoclar Vivadent for 20 seconds, then rinsed and dried before applying a thin layer of Bis-Silane (Bisco) to dry for one minute. Once it cooled, I applied a warmed composite resin to the crown, which was positioned on the tooth and light-cured. The PVS material could now be removed from the endodontic access (Fig. 7). After the canal was thoroughly cleaned, the fiber post was inserted and the fit verified. Water was applied on all internal surfaces; this acts as a lubricant (Fig. 8).

After the fiber post was cleaned with alcohol, a thin adhesive agent was placed. Warmed composite resin was adapted over the fiber post and inserted into the lubricated canal (Fig. 9), then cured through the light-conductive fiber post. The anatomic fiber post was then created and removed, covered with glycerin, and light-cured again outside of the canal to ensure complete polymerization (Fig. 10). After light-curing, it won’t be possible to remove the post if the composite resin engages undercuts.4

A thin layer of adhesive agent was then applied on the anatomic post and protected to avoid premature polymerization. The canal was cleaned with 2% chlorhexidine (Fig. 11), then rinsed and dried using paper points before 35% phosphoric acid was applied by agitation for 15 seconds. The canal was then washed with water using an endodontic irrigation syringe, and dried again with paper points. To avoid bond-strength degradation from matrix metalloproteinases (MMPs),5 I applied 2% chlorhexidine with long microapplicators, then used paper points to eliminate antibacterial solution excess.

Multiple layers of primer were applied with a microbrush and dried for 40 seconds while the solvent evaporated. Then I applied an adhesive agent and injected Duo-Link dual-composite resin cement into the canal (Fig. 12). Once the anatomic post was fully inserted, I placed glycerin on every surface, ensuring a total polymerization of the composite resin cement6 (Fig. 13). This minimizes the thickness and results in less setting contraction. (It also increases the strength of the chemical bond to the root canal walls.7,8)

Failure mode analysis suggests superior cement curing when translucent posts are

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*Fig. 5*

*Fig. 7*

*Fig. 9*

*Fig. 11*

*Fig. 12*
used. The rubber dam was removed and the occlusion inspected (Fig. 14). To prevent potential bruxing, the patient was provided with a night guard.

The patient returned to the office for a one-year evaluation. After X-rays and a thorough inspection, the anatomic post and crown were in excellent condition, both functionally and aesthetically (Fig. 15).

**Conclusion**

When a significant portion of a crown is missing because of caries or fracture of an existing restoration, dentists may need to use a post to provide additional retention for the crown. These kinds of compromised restorations often fail because of fatigue and repeated functional stress and torque. Fiber-reinforced posts also possess better optical properties than metal or metal oxide post systems.

Materials and techniques for fiber-post restorations of endodontic treated teeth are continuously evolving with better clinical results for our patients. Recently, woven fiber ribbons such as those by Ribbond have also been used successfully to treat similar clinical problems.

**References**


**Think Outside the Cabinet**

Are you making the right decision for your rear treatment wall?

Rear treatment design is critical for the productivity of the team – it’s important to get it right.

Traditional cabinet-based operatories are expensive, lack ergonomic function, and can become cluttered. They are not easily updated, reconfigured, or transported – should you wish to remodel or relocate your practice.

The solution? Flexible, cart-based delivery for both Doctor and Assistant. This modular platform creates freedom in modern design while providing superior ergonomic function and the ability to update with newly emerging technology. Plug-and-play functionality means adding equipment only as necessary, growing your practice at your own pace while avoiding additional construction costs.