A Progressive Approach to High-Tech Post & Core

By Norman L. Hicks*

When restoring the endodontically treated tooth, especially when crowns are indicated, we must always remember that the prognosis for that tooth rests figuratively and literally on the materials and techniques employed at this unglamorous post/core stage.

Clinical studies comparing the 4-year performance of custom cast posts against the more advanced fiber posts, clearly favor the contemporary, low-modulus approach, in terms of the inherent risk of root fracture. While in vitro testing can indicate a high fracture resistance, that fracture also proves non-repairable 70% of the time.2

Fiber posts, introduced in Europe in the early 1990’s, were originally fabricated from carbon fibers (Composipost®, RTD, St. Egreve, France). Although neither esthetic nor radiopaque, these posts (and the 3 generations that have followed) have proven capable to do everything a post needs to do, through in vitro studies and clinical trials but without predisposing to root fracture. This is possible because the Elastic Modulus rigidity of fiber posts is approximately the same as the composite and dentin19, so the components function in mechanical harmony. The state-of-the-science fiber post is the DT (Double Taper) Light-Post. Radiopaque 20 and highly light-conductive 21, 22, it provides retention slightly better than parallel metal PantasPost25.

Necessity: the mother of invention

The “double-taper” design comes from extensive anatomic measurements of root canals, undertaken by Endodontic and Prosthodontic Professors at the University of Montreal upon deciding that it was time for an endodontic post that fit the root canal, rather than modifying the root canal to accommodate an antequated post design. Each post size has two separate tapers, and a cylindrical portion that provides a good adaptation24-26. Often, when utilizing base castings, stainless steel for post/core, corrosion potential and bi-metalic reaction (galvanism) problems arise. Fiber posts cannot corrode. Fiber posts are also shown to be less likely to cause micro-leakage than rigid metal posts 27-29.

For a variety of reasons, millions of root canal treatments require retreatment every year, and roughly 25% of those will require the removal of a post 30. The removal of fiber posts is done quickly, by following them out 31-35.

Although there are fiber posts available, they are not all the same. They can vary considerably in their physical and mechanical properties. Published in vitro testing shows that the Quartz fiber posts (DT Post & DT Light-Post) are stronger than other fiber posts 36, 37, and more fatigue resistant than prefabricated metal posts 38 and other fiber posts 39, 40. RTD posts also have good clinical studies that support their products 12-18, some documenting up to 11 years of service 40.

How do you improve on perfection?

Clinicians experienced with translucent fiber posts know that if removal becomes necessary, the restorations can be white and the post can be placed before or after placement. That’s the easy part.

Once the post is placed, the COLOR DISAPPEARS, and you hope that you never see it again, except on a radiograph. However, should removal become necessary, the color RE-APPEARS ON COMMAND, by spraying with cold water. This makes it much easier to locate the post and to determine when all of the fibers have been removed.

By Norman L. Hicks is an independent consultant, based in the USA, and a 32-year veteran of the dental industry. He has been published several times on the topic of low modulus reconstruction. You can view and download a full bibliography at normanhicks.com/fiberpostresearch.

References:

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Al Rais Medical & Dental Trading FZE

Tel: +971 7 2077407, Fax: +971 7 2041010


