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 1. 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 5 generations that have followed) have proven capable to do everything a post needs to do, through in vitro studies 3-11 and clinical trials 12-18, 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 dentin 19, 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 ParaPosts 23.

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 antependent post design. Each post size has two separate tapers, and a cylindrical portion that provides a good adaptation 24-25 with minimal dentin sacrifice, as recommended by the Endodontic textbooks 26.

Often, when utilizing base cast metals or stainless steel for post/core, corrosion potential and bi-metallic 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 hollowing 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 (Light-Post and 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.

Invention 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 good esthetics it can be hard to see, inside the core composite and tooth structure. It involved yet another patent for RTD, but the new DT Light-Post ILLUSION, includes bio-compatible pigments in the proprietary resin matrix. These impart an intrinsic color to the posts, matching the corresponding drills, which helps identify the post’s size 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.

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References:


The Beauty of Ceramics with the Strength of Metal