VII. MISCELLANEOUS

Christensen, G. J. **Post concepts are changing, *JADA, Vol. 135 Sept., 2004, 1306-1310***

Recently there is a clearly observable movement toward use of fiber-reinforced resin-based composite posts used in conjunction with composite build-ups. The resin-cemented fiber posts, followed by composite build-ups were as strong as the metal posts used with composite build-ups. They do NOT impart any objectionable color to the tooth. In terms of most of the necessary post characteristics, the fiber posts are superior to metal prefabricated posts. They are easy to place, are relatively inexpensive, can be bonded to resin cement, and are easy to remove if the tooth needs to be retreated endodontically.

Dallari, A. and Rovatti, L. **Six Years of in vitro / in vivo Experience with Composipost. *Compendium*. *17: S57-S64, 1996.***

Abstract/conclusions: Some years ago, we created the following classifications for endodontic posts: (1) first generation posts (self-threaded posts, screw posts, serrated-carved posts); (2) second generation posts (passive posts); (3) third generation posts (nonmetallic passive posts). In this last group, we placed carbon-fiber posts, (**ComposiPost**) which have a modulus of elasticity very similar to the modulus of elasticity of dentine and can realize a tooth-post-core monobloc instead of an assemblage of heterogeneous materials. This is quite a new philosophy in rebuilding endodontically treated teeth and is based on the use of integratable materials that homogeneously distribute masticatory loads and reduce stress.

Dietschi, D., Romelli, M., and Goretti, A. **Evaluation of Post and Cores in the Laboratory: Rationale for Developing a Fatigue Test and Preliminary Results. *Compendium*. *17: S65-S73, 1996.***

Abstract/conclusions: Prosthetic treatment failures related to the biomechnical deficiencies of post and cores still represent a problem of clinical significance. To overcome the difficulties of clinical studies, numerous in vitro methods were developed to address specific properties of post-and-core restorations. Most of them, however, were based on an oversimplified mechanical testing of the restored tooth. Experience proved that the fatigue of the restored materials was a primordial factor in clinical failures. Therefore, special devices were built that simulate the physiological masticatory cycle. Tests performed with adhesive post-and-core systems seem to indicate that materials placed in the tooth should have physical properties as close as possible to those of natural tissues. New carbon-epoxy posts (Composipost) appear to offer a promising solution for restoring the endodontically treated tooth.

Duke, S. E. **New Directions for Posts in Restoring Endodontically Treated Teeth**. ***Compendium 23 116-121, 2002***

Abstracts/conclusions: Metallic prefabricated posts have dominated the market for a number of years. Yet, in the past several years, polymeric, ceramic carbon or fiber-reinforced, and other novel systems have emerged into the post material market. These newer systems have focused on physical properties, such as modulus of elasticity (rigidity), more closely matched to dentin, to reduce stress concentrations within the root canal and reduce the incidence of fractures. An additional feature with the newer posts has been the esthetics with composite core materials. Minimal clinical research or simulation studies are available; however, results have been favorable, with high retention rates and a lack of root fractures. With the abundance of literature demonstrating that metallic posts have a greater number of disadvantages over selective modern technologies, it is now time to examine the dental school academic cirriculums concerning post techniques. As more clinical data becomes available, the guidelines for post selection in restoring endodontically treated teeth should become more defined and a general consensus may be reached.

Ferrari, M, Mannocci, F. **A one-bottle adhesive system for bonding a fibre post into a root canal: an SEM evaluation of the post-resin interface.** Int. Endodontic Journal, ***33, 397-400, 2000.***

Abstract / conclusions: This report presents a case in which a “one-bottle” adhesive system (ONE-STEP) was used in combination with proprietary resin cement for bonding a fibre post. The fibre post was placed into the root canal of a fractured root under clinical conditions and then extracted 1 week later. Using Scanning Electron Microscopy, half of the root was evaluated for hybrid layer formation and the other half for assessing resin tags. The investigation demonstrated that the one-bottle system can infiltrate and create a mechanical interlocking with etched root dentine.

Glazer, B. Endodontic **Post Evolution: From Metal to Quartz *Oral Health, May, 2002 43-45***

Abstract/conclusions: The Light-Post is a 15-year evolution of post research at RTD. Its genesis began with the carbon fiber **ComposiPost**/ C-POST, transformed into the **Aestheti-Plus,** made of white quartz fiber, and finishing with the Light-Post, made ouit of translucent quartz fiber. This transition from Carbon to Quartz was completed without any compromise in strength, modulus of elasticity, resistance to fatigue or the ability for re-treatment. The Light-Post offers clinicians significant aesthetic and clinical advantages due to its translucency.

Gluskin, A., Ahmad, I, Herrero, D. **The Aesthetic Post and Core: Unifying Radicular Form and Structure.** ***Pract Proced Aesthet Dent 2002;14(4):313-321.***

Abstract/conclusion: Use of a post system for the rehabilitation of endodontically treated teeth requires traditional planning for the function of the restoration as well as a structural and aesthetic strategy for novel technologies in ceramic and composite dentistry. Contemporary material options have greatly expanded the clinician's ability to rehabilitate the corono-radicular complex. Transilluminating posts, bondable fabrics and high-technology ceramics create exciting possibilities in post and core design. The use of bondable materials allows the practitioner to unify the structure and morphology of root systems to provide creative solutions to challenges heretofore unmet.

Pitel, M. L., Hicks, N. L. **Evolving Technology In Endodontic Posts**. ***Compendium 24 13-29, 2003***

Abstract/conclusions: This article provides a brief overview of important, recent changes in the philosophy, materials and technology that have impacted significantly on the art and science of endodontic post placement. The growing interest in esthetic dental restorations and adhesion dentistry has driven both manufacturers and dentists to create some innovative new post materials and techniques for restoring the endodontically treated tooth. Although metal posts were used extensively for many years, their popularity is currently in the decline. With more than 10 years of proven clinical success, there is now widespread interest in the use of non-metallic post materials and techniques. Over the last decade, in vitro and in vivo testing has demonstrated that some fiber-reinforced endodontic posts can dramatically reduce the incidence of root fracture, tissue discoloration and allergic reaction. If endodontic re-treatment is necessary, most fiber posts can be removed from a root canal with ease and predictability when necessary without compromising their only true function; core retention. Today's marketplace offers the dentist many choices in size, radiopacity and designs to fit the needs of the specific tooth and clinical application. The use of a highly translucent post not only can serve to enhance esthetics in the final restoration, but can also be useful as an instrument in the light-curing process.

Quintas, AF, Dinato, JC, Bottino, MA, **Aesthetic Posts and Cores for Metal-Free Endodontically Treated Teeth.** ***Pract Periodont Aesthet Dent 2000; 12(9):875-884***

Abstract/conclusions: Utilization of contemporary post and core systems has facilitated the aesthetic restoration of endodontically treated teeth. Light transmission and biocompatibility have been enhanced by the introduction of metal-free post systems. The periodontal and endodontic status, root length and histological structure of the devitalized teeth must be considered in order to achieve successful restoration after endodontic treatment. This article presents various restorative criteria for the esthetic placement and buildup of post and core materials, as well as the preservation of maximum coronal and root structure.

Torbjorner, A., Karlsson, S., Syverud, M., and Hensten-Pettersen, A. **Carbon fiber reinforced root canal posts: Mechanical and cytotoxic properties**. ***European Journal of Oral Science***. ***104: 605-611, 1996.***

Abstract/ conclusions: The aim of this study was to compare the mechanical properties of a prefabricated root canal post made of carbon fiber reinforced composites **(ComposiPost**; RTD, St. Egreve France) with metal posts and to assess the cytotoxic effects elicited. Flexural modulus and ultimate flexural strength was determined by 3 point loading after Composipost posts had been stored either dry or in water. The bending test was carried out with and without preceding thermocycling of the Composipost posts. The cytotoxicity was evaluated by an agar overlay method after dry and wet storage. The values of flexural modulus and ultimate flexural strength were for dry stored Composipost 82±6 GPa and 1154±65 MPa respectively. The flexural values decreased significantly after water storage and after thermo-cycling. No cytotoxic effects were observed adjacent to any ComposiPost. Although fiber reinforced composites may have the potential to replace metals in many clinical situations, additional research is needed to ensure a satisfying life span.