Endodontic retreatment with canal shape fitting posts

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A healthy 58 year old female with a history of "sporadic" pulpal necrosis of tooth 22, featuring no past history or recollection of dental trauma to the area. As such, the tooth was endodontically treated via an orthograde approach 5 years ago and a crown subsequently placed. Over time, a combination of slight tissue recession and radicular darkening from possible residual pulpal remnants had led to an unesthetic result, affecting the patient's confidence in smiling. Of note, as the patient exhibited high lip dynamics with critical gingival display during the Duchenne smile, the restorative solution sought would need to have maximum stability of the gingival margin.

Options considered were endodontic retreatment of tooth 22 before internal bleaching extending to the coronal third of the root, along with exodontia and immediate implant placement, with or without the use of a "socket shield" approach. The goal was to minimize the risk for apical migration of the gingival margins, along with the interdental papillae. Risk:benefit and cost:benefit ratios were considered, and retention of the tooth with endodontic retreatment and internal bleaching the option of choice. After all, one can always defer to the implant route as a Plan B.

Following endodontic retreatment, a post space was created to a Rely-X Post Red metric to a length of 16.4 mm from the incisal edge. The coronal access and root were internally bleached using sodium perborate by the endodontist before referral back to my service for placement of a post, removal of the crown and repreparation to a slightly intracrevicular position on the facial aspect. Upon removal of the Fuji II and Cavit occluding the endodontic access, it was noted that the canal morphology was that of a tear-shaped ovoid outline. A traditional round type glass-fiber post would be suitable but would not occupy any of the off-shoot ovoid extension of the canal. This area would be then unsupported by the post structure and occupied solely by the post cement.

A solution was to utilize the new Rebilda Post GT from VOCO. This post is essentially a post made of many smaller posts, with each glass fiber 0.3 mm in diameter: a post that has the "fluidity" to fit virtually any canal shape, unrestricted by anatomy. A 1.4mm diameter post bundle was chosen, as this was not only the largest size available, it was the one which would allow the greatest number of fibers into the "off-shoot" ovoid extensions of the canal, supporting the cement that was to fill that area.

Material Comments

Rebilda Post GT utilizes glass fiber bundles (70% of the content) composed of 0.3 mm fiber strands in various preset fiber bundle diameters of which 10% of the content are fillers, which is responsible for its outstanding radiopacity of 408% Al and finally 20% DMA resin matrix to bond it all together. From a support standpoint, the E-modulus stands at 31.5GPa, which is stronger than superficial dentin and thus allows the crown-root complex to regain a degree of rigidity; reinforcing the definition of what an ideal restoration should be: to rewind as much as possible the clinical situation to that of a native, healthy tooth along with all its biomechanical attributes.

Author

Dr Clarence Tam heads a practice in Auckland, New Zealand, which specialises in cosmetic and restorative dentistry. She is originally from Canada, where she completed her Doctor of Dental Surgery and General Practice Residency at the University of Western Ontario and the University of Toronto, respectively. Clarence is the Chairperson and Director of the New Zealand Academy of Cosmetic Dentistry. She is currently the only person in Australasia to hold Board-Certified Accredited Member Status with the American Academy of Cosmetic Dentistry. She frequently and continually lectures internationally.

Clinical Case

Fig. 1: Endodontic access and post space exposure after removal of provisional materials. Old lithium disilicate crown intact but with overhanging margins on the facial.

Fig. 2: Try-in of Rebilda Post GT (VOCO) 1.4mm diameter bundle post-debridement and sterilization of canal

Fig. 3: Following Futurabond U (VOCO) application intracanal, dentin-shaded Rebilda DC (VOCO) was placed against the apical gutta percha plug using a thin cannula and the entire space backfilled before placement of the 1.4 mm bundle to length. The black sleeve incisally can be removed manually or with a water-free transverse sectioning (no water) after cement placement but before final curing. This will enable “fanning” of the fibers and ideal even distribution throughout the intended post space for maximum support.

Fig. 4: Appearance of finalized crown preparation with Rebilda Post GT fiber distribution visible through the restored access cavity

Fig. 5: Close-up of the final result

Fig. 6: The restoration appears absolutely naturally

Fig. 7: Periapical radiograph taken immediately after post-placement and crown removal. The fan orientation of the fibers throughout the core material is evident.