

Endodontic Retreatment: Charting a Renewed Course

Gary D. Glassman, DDS, FRCD(C), Kenneth S. Serota, MMSc, DDS, Frederic Barnett, DMD

The past two decades have revolutionized endodontic therapy, enabling the preservation, rehabilitation and reconstruction of damaged dentitions. Fifty million root canal procedures are performed annually in North America alone. Studies show a wide range of success rates for root canal treatment reflecting the complex nature of endodontic therapeutics. Verificationism (a term synonymous with "evidence based") concerns the establishment of the 'truth' of a given statement, based on a certain means of supplying evidence. Endodontic retreatment failure is reported in the literature to occur in the long term at a rate as high as 50%. The verificationism of these reported results is readily prejudiced by the design of the studies, the techniques employed, the operators performing the treatment, the recall time period, and the criteria used to define success or failure. The corollary, falsificationism, can be equally as evident in the literature. Investigations conducted or financed by product manufacturers offering disingenuous claims of high success rates also abound.

Outcomes vary based on the clinician's experience and expertise, the type of tooth involved and a myriad of other clinical and biological factors. The common reasons for endodontic failure include missed canals, coronal leakage, post placement errors, blocks, ledges, perforations and transportations, fractures, inadequately filled canals, separated instruments and resin based obturating pastes. These are clinician vectored iatrogenesis; nonetheless they are preventable. We must be prudent in treatment planning; biologic failure is correctable and predictable. It should not be considered de rigueur to remove the failure and reengineer the dentition with titanium artifice.

Sometimes you must take a step back to move forward. Removing restorations in their entirety to access the root canal space can reveal caries, restoration failures, complete and incomplete fractures, leakage, missed canals, blockages, ledges and perforations. Exciting new technologies are available to dismantle restorations. Microscopes enable topographic surveying of the intrachamber and intraradicular landscape, new irrigant solutions eliminate smear layers which obviate replication of the microstructural anatomy of the root canal space, ultrasonics facilitate uncovering of the complexities of the root canal system, removal of core material, posts, solid core and resin paste obturating materials and mineral trioxide aggregates seal communications and perforations previously untreatable with any degree of effectiveness. Remarkably, cementum grows over this nonresorbable and radiopaque material, allowing for a normal periodontal attachment apparatus. Research into new materials continues unabated. The latest innovation in endodontics is Resylon, resin percha used in conjunction with Epiphany (resin) sealer. The concept of a monobloc from the occlusal surface to the apical foramen has arrived.

Careful case evaluation and treatment planning is the key to any successful outcome. Case selection for endodontic retreatment is based on restorability, periodontal condition, and the capability of superceding anatomic anomalies such as calcific, prosthetic, iatrogenic obstructions, and unusual canal morphology. The strategic value of the tooth as well as alternative treatment options must be considered. As long as these factors are assessed favourably and the economics is practical for the patient, the primary treatment consideration for endodontic failure should always be retreatment.

Even if apical surgery is inevitable, its prognosis is better when it is immediately preceded by, or performed in conjunction with orthograde retreatment. Injudicious, imprudent, cavalier removal for the sake of expediency is not consistent with an optimal standard of care.

We have an obligation to our patients to provide them with the information that teeth which in the past were doomed to extraction and replaced with either an implant, or a fixed or removable prosthesis can now and should be considered for endodontic retreatment that carries with it a very high success rate when performed with high quality. The retention of the natural dentition can predictably sustain function, mastication, speech, deglutition, prevents gagging, preserves associated structures, satisfies aesthetics and improves a sense of well being.

While the same can be said of endosseous implants, however, there is a distinction in the proportionality of the application of the procedure. Their primary role relates to rehabilitation of patients who have undergone extensive ablative surgery for cancers of the face and oral cavity or have lost soft and hard tissues from disease or trauma. For many of these patients, one of the most distressing aspects of treatment is the difficulty in obtaining prostheses which are stable, retentive and aesthetic. Removal of teeth for the purposes of expediency is analogous to throwing the baby out with the bath water. The art and science of dentistry is based on sophistication and excellence; it should never "bend the rules" to follow a path of lesser clinical resistance.

Perhaps the real problem lies not in the determination of the advantage or superiority of biology versus biomimetics. Perhaps it simply lies in the need for prevention, early diagnosis and a renewed appreciation of the most fundamental need of the gnathostomatic system; occlusal harmony and balance. Maybe all that's necessary is to revisit the tenets of pulpal pathophysiology and renewing the standard of care that fosters endodontic excellence. The controversy of retreatment versus extraction and implant placement would then be rendered mute.