



Guest Editorial

Minimally invasive endodontics: Saving the precious dentin

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“Begin with the End in Mind means to start with a clear understanding of your destination. You need to know where you are going to better understand where you are now so that the steps you take are always in the right direction.”
Stephen Covey

The result of a successful root canal procedure means long-term sustainability of the tooth in the oral cavity. However while mechanically preparing the tooth for removing the microorganisms and pathologic debris from the root canal system, we must be vigilant about the preservation of crown and root dentin.

Biomechanics of dentin

Dentin can bear compressive forces better than tensile forces due to its special structure consisting of organic, inorganic components, and fluids. It possesses the facility to transmit stresses and prevent fractures, thereby making its preservation all the more important. Minimally invasive endodontics pays special attention to accurate diagnosis and astute treatment planning by ensuring conservation of three areas- access cavity, cervical area, and apical preparation.

Access cavity designs

Traditional access cavity designs with an emphasis on straight-line access to the orifices cause a reduction in fracture toughness of the tooth because of increased tooth loss. Conservative Class I access causes a reduction of 5% in the stiffness of the tooth. However, this number can increase to 63% when the marginal ridges are involved. Various newer designs have been experimented with to achieve maximum fracture resistance.¹

Newer access designs include

1. Conservative Endodontic Access Cavity
2. Ninja Endodontic Access Cavity
3. Orifice-Directed Dentin Conservation Access Cavity
4. Incisal Access
5. Cala Lilly Enamel Preparation
6. Micro-guided EndoAccess

Minimally Invasive Endodontics focusses on making conservative access cavity preparations which avoid straight-line access to all canal orifices, at the same time. It takes into use the enhanced flexibility of the newer and advanced glide path files and the rotary instruments used. The root canals prepared in this manner result in an adequately restored endodontically treated tooth with a good survival period in the oral cavity.²

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Cervical Area Preservation: Attempts are made to prevent fracture rates by the preservation of the cervical area of the concerned tooth

1. Peri Cervical Dentin – The dentin surrounding the alveolar crest, 4mm above and below, is considered an irreplaceable critical zone that has to be conserved.
2. 3D ferrule – It differs from the traditional ferrule as it contains three components: traditional ferrule, dentin girth, and total occlusal convergence.
3. 3D Soffit - When a small portion of the pulp chamber roof is left intact such that it curves 90° to the wall. It could be as small as 0.5 mm, or as large as 3.0 mm in some cases (where extra strength is needed, or when the anatomy allows it).³

Apical Preparation/ Cleaning and Shaping

The traditional perception of enlarging the apical portion to large sizes has been changing with the advancements in armamentarium for cleaning and shaping the root canals. The area of concern is to allow the irrigant reach the apical thirds without removing any excessive dentin.

3D shaping using advanced file systems like XP Endo Shapers, Trunatomy or Endo-Eze anatomic endodontic technology ensures optimal mechanical shaping of the canal system.

Activation of irrigants using sonic, ultrasonic, lasers, or gentle wave systems enable complete disinfection of the root canal system while conserving the structural integrity of the root dentin.

Conclusion

As stated in the beginning, it is always best to start planning with the end in mind.

During diagnosis of endodontic lesions, the clinician should assess the tooth for restorability, periodontal status,

and occlusal function. The result of the endodontic therapy should be the long-term sustainability of the endodontically treated teeth in the oral cavity. Shaping of root canals conforming to the canal anatomy, using more effective disinfection systems that do not require wider apical preparations, and hydraulics of bioceramic sealers that help in the proper 3D seal in necessitating larger taper to accommodate pluggers for the same promote the biological success of Minimally invasive endodontics.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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