

Minimally Invasive Endodontics: The Expectations and Reality

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Minimal intervention dentistry is a concept of delivering the professional care with the first occurrence, earliest detection and earliest possible cure of disease on molecular levels, followed by minimally invasive and patient-friendly treatment to repair irreversible damage caused by such disease which enabling the professionals from preserve the tissues with minimum loss without causing any damage to adjacent tissue[1-3].

The endodontics as a branch of dentistry also involved in the Technological revolution in optics, instruments, materials, and computer systems that make the application of minimal invasive approaches are possible in endodontic field[4].

The main targets of the successful endodontic treatment are achieved by eliminating all organic substrate from the root canal system and fill this system in way that ensure the biological goals for long-term success of endodontic treatment. This success is reached by an adequate knowledge about the conservation and elimination of tooth structure during endodontic procedure. Moreover the effective endodontic therapy emphasis on accessing, shaping and cleaning the system in a manner that will enable efficient and total filling of the root canal space, while leaving the tooth with sufficient strength to function successfully, that making minimally invasive endodontics philosophy based on maximum preserve the healthy coronal, cervical and radicular tooth structure during the endodontic treatment[5,6].

For this reasons a lot of traditional methods to access prepare the root canal system changed to cope with this development in enhanced lighting and magnification and highly flexible rotary instruments[7]. For instance the traditional straight-line access cavity preparation which structurally compromise the tooth by removing an excessive amount of dentin that's will affect the long-term survival of the endodontically treated tooth, while the contracted access cavity design which focusing on the minimal removal of the tooth structure that could increase tooth survival and fracture strength by dentin preservation[8].

Also the root canal shaping according to the minimal invasive concept should be conservative as much as possible and avoid over-flaring in order to make the root strong enough to cope with the obturation compressive strength and maintain the tooth in functioning and withstanding the mastication forces which can be achieved efficiently with flexible rotary flexible nickel-titanium instruments[9,10].

The apical preparation still controversial point in the literatures. The smaller apical preparation whereas can create a tight apical seal, adequate resistance form with continuous tapering that can maintain good disinfection[11,12]. While the larger apical canal diameters are important to shape the apical canal wall, remove the debris, deeper irrigation to the terminus will be allowed and reducing remaining bacteria in the root canal system[13,14]. However it was appeared from the evidences there were no any apical preparation methods could make the apical terminus free from bacteria, so that the smaller apical preparation advocated because it conservative technique and reduce the apical distortion and can adequately eliminate the bacteria in comparable way to the large apical preparation[15,16]. It was clearly appeared the total elimination of biofilm and bacteria from the root canal system did not achieved by any current cleaning and shaping techniques that lead the both researchers and clinicians to focus on increasing the disinfection efficacy by using different techniques such as; manual, sonic, ultrasonic and laser activation[17].

The Minimal Invasive Endodontics (MIE) as a concept and philosophy based on preserving sound tooth structure during access cavity opening, canal scouting, glide path, and instrumentation[18] which required sophisticated devices and instruments such as; surgical microscope, ultrasonic-assisted preparation techniques, modern flexible file systems and irrigation activation systems, beside the clinician deep knowledge in root canal anatomy to achieve its goals in good predictable outcome and reduce the errors and emphasis on safe endodontics practice. In conclusion the MIE remain a controversial issue regarding the disinfection efficiency but it could represent the future in contemporary endodontics with the huge development

in devices and materials. However more researched are needed to show its efficiency in compared with traditional methods in endodontics.

Conflict of interest

The authors don't have any conflict of interest.

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