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Effectiveness of irrigation as the key factor in root canal treatment of teeth with apical periodontitis

Effective chemomechanical preparation of the root canal and optimal 3-d obturation have been recognized as the two ultimate goals of endodontic treatment, more particularly in teeth with necrotic infected pulp and apical periodontitis disease. The effectiveness of irrigation in the complex root canal system at the apical root canal remains the most critical therapeutic requirement to treat apical periodontitis. Experimental approaches and clinical data showed that irrigation is the most effective way for eradication of the root canal bacteria (planktonic and biofilms). The characteristics of irrigation protocol, such as the solution flow dynamics and irrigant replacement, have been recently attracted attention as the key factors in successful treatment outcome. The aim of this study is to critically review observations in relation to the variation of morphology of the apical canal system in different tooth types, and the required profile of apical canal instrumentation. The cross sectional diameter of the apical part of the used hand and rotary files, need to be evaluated before application of the irrigation protocol. The instrumentation technique should also be selected on the basis of the desirable geometry of apical root canal preparation. Finally the optimal working length must be carefully determined and confirmed in order to decrease the risk of apical debris and irrigant extrusion. The apical root canal irrigation as a balance between effectiveness and safety is further discussed and conclusions are justified on the following subjects: 1. The desirable size of apical enlargement, 2. The optimal design (taper) of apical part of instruments and 3. Distance of irrigation needle from the apex and 4. The specific form of irrigation needle tip.

Biography

Dimitrios Tziafas is a Professor in Endodontics, and did his Master's in Endodontics from Hamdan Bin Mohamed College of Dental Medicine, MBRU in Medicine and Health Sciences, DHCC, Dubai, UAE. He is engaged with teaching in Endodontics for more than 30 years. He chaired the Department of Endodontics in Aristotle University of Thessaloniki, Greece (1999-2013) and served as the Director of Master's Programs in Endodontics in AUTH (2004-2013) and European University College, Dubai (2014-2016). He has published eight invited reviews in biomedical and dental journals, and has over 45 peer-reviewed research papers, a monograph on reparative dentinogenesis and textbooks chapters relating to pulp biology. His research interests include cytodifferentiation mechanisms during tooth development and dental pulp repair/regeneration, and preclinical evaluation of endodontic materials. He is actively involved with the Research Committee of European Society of Endodontology (2004-present). He served as the President of IADR – Continental European Division (2006-2008).

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