The root canal treatment battlefield: how to select the best weapons to face different clinical situations

ABSTRACT

The control of microbial infection is the key for a successful endodontic treatment, orthograde and surgical mechanical debridement of the root canal space together with an optimal sealing of the endodontic space are crucial to achieve this goal. The impact of present advancements in concepts and techniques, instruments and technologies on the quality of the treatment procedures will be assessed and discussed clinically and with the aid of researches conducted using modern investigation 3D techniques, including in vivo CBCT and in vitro micro-computed tomography (MCT). The lecture will describe how the development of new instruments and techniques continues to revolutionise the approach to the different steps of the cleaning, shaping and sealing phases of the root canal treatment. New diagnostic tools, the use of microscope and magnification, the enhanced mechanical characteristics of endodontic instruments and new approaches to chemical and mechanical debridement permit the clinician to enhance the quality of the treatment, starting from a more conservative approach to the access cavity and orifice opening, to a selective root canal preparation including an accurate approach to the apical anatomy and an enhanced attention to the cleaning of the inaccessible areas. The use of innovative bioactive sealing materials will be discussed and the possible evolution of the future scenario in the field of root canal obturation will be addressed. Endodontic surgical approach and other procedures such as intentional reimplantation will be considered as part of the possible weapon to solve the different possible situations that we can face clinically.