

Endodontics of the future

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In the last 50 years of endodontics life, significant changes occurred towards health promotion for patients, with elimination of infections, and at the same time, maintaining teeth in the oral cavity. This fact represents an important judgment within the analysis of factors for the evolution of a specialty in the area of human health.

Scientific advances in basic areas have allowed deeper and better understanding of the phenomena that involve the processes of aggression and defense within the individual's immune system. Both areas microbiology and pathology have contributed significantly to important studies of the current state of knowledge. The control of infectious processes in a noble area of the human body (face / head) and the correlations with other organs warned about essential care during the procedures for the treatment of infected root canals. The role of bacterial biofilm favoring the maintenance of endodontic infection and the strategies for its destruction has motivated many studies and advances in this line of research. Likewise, regenerative endodontics was another real example of the transformation of concepts, which has evolved significantly.

In materials science can realize significant achievements with biologically materials well tolerated by tissues such as bioactive agents (calcium hydroxide, Mineral Trioxide Aggregate-MTA, cement containing calcium silicate, and others). The sealing of root perforations and retro-preparations with these bioactive materials in parendodontic surgeries allowed a lower number of tooth loss and a longevity of endodontic treatments. Knowledge of the mechanism of action of calcium hydroxide on bacteria and tissues, of sodium hypochlorite on bacteria, and the disclosure of MTA components has stimulated a variety of new studies and clinical applications.

In applied science, new technologies have brought modern perspectives to endodontics, which have been gradually incorporated into therapeutic protocols. The recent proposed advances have allowed endodontic clinical practice to have a wide range of nickel-titanium rotating systems and instruments. These new instruments supported the development of a high-quality endodontics, with a drastic reduction in accidents, previously common during emptying and widening of the root canals. The sanitization strategies included the activation of irrigant by means of ultrasonic inserts for mechanical agitation to enhance and intensify the procedures for decontamination of infected root canals. Apical locators allowed reduction on difficulties during the determination of the apical limit imposed by overlapping periapical radiographs. In parallel, with the innovations, analogue radiology was gradually being replaced by digital radiology. The use of magnification in clinical procedures improved the field of vision for the professional, contributed to the more precise technical mastery during operative procedures, whether conventional or surgical.

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In addition to the important technological achievements, the incorporation of imaging examinations with cone beam computed tomography (CBCT) into endodontic practice had an impact on planning, diagnosis, clinical decision-making and monitoring, which directly interfered with the prognosis. The accuracy of imaging examinations with CBCT in endodontics enabled a very large amount of information, details of the anatomical structures, periapical lesions, dental fractures, traumatic dental injuries, root perforations, among other conditions. The 3D reconstruction of the CBCT images, scanning, prototyping / 3D printing, which has enabled direct, conservative and accurate access to the surgical field. In guided periapical microsurgeries there has been a profound gain in quality and safety, especially regarding the care with variations and noble anatomical structures.

Care in restoring the function of the endodontically treated teeth is based on the premise that its conclusion occurs after the restoration of the lost tooth structure. The recovery of dental function and occlusal harmony are essential elements in the rehabilitation process. In this sense, adhesive procedures have given a new direction to the restoration of endodontically treated teeth.

Until a few years ago, the word endodontics was associated with the presence of pain, as if they were synonymous. Several of these aspects associated with innovations in the endodontics of the future were the result of studies developed by Brazilian researchers, which highlights the quality of Brazilian endodontics in the international scenario. Based on the contextualization of the advances achieved by endodontics in recent years, the mastery and incorporation of new science and technology into clinical practice has enabled significant benefits to human health.

At first it seems to be redundant to talk about biological endodontics, because there is no way not to be biological. However, it is essential to develop endodontics based in science. Endodontics within this modern perspective of the future, performed with precision and greater control, is already being put into practice by our dentistry students.

In this context, endodontic science is highlighted as an essential area for human health and a permanent growth with clear evolution to the current high-quality stage of endodontic treatment. The biggest challenge for all researchers, teachers, professionals and students is to accept changes, have access to innovations, and above all, to be open to learning and mastering new skills to live with the endodontics of the future, which today are already available.

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