



Modern View on Problematic Issues in Endodontics

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Abstract: In this article presents information about the most serious problem in endodontically. In clinical practice were described the basic rules and principles of endodontics cavity preparation (coronal and root canals) for prevention errors. The main recommendations gives by authors for quantity endodontically treatment of teeth.

Keywords: Errors, performance the preparation of coronal and root canals, prevention of problems, recommendations.

Introduction: An important and urgent problem of modern dentistry is the treatment of complicated caries - pulpitis and periodontitis. Diseases of apical periodontium is unfortunately one of the main reasons for tooth extraction. In addition, teeth with apical periodontitis often cause odontogenic inflammatory processes in the body due to destructive processes at the root apex. In recent years, more and more attention is paid to the quality of endodontic treatment. As is known, the oral cavity is a unique part of the body, which always contains different strains of bacteria (beneficial and aggressive). From the position of evidence-based dentistry, bacterial plaque on teeth (biofilm or biofilm) is regarded as a set of different strains of bacteria designed to survive together, among which there may be both non-cariesogenic and cariesogenic. Scientifically substantiated evidence of the pathogenic role of biofilm forms the foundation in revealing the mechanisms of oral disease development, including caries and its complications. At the same time, low level of patients' awareness about the rules of oral care, untimely diagnosis of diseases, gingivitis and early forms of caries contribute to the development of irreversible forms of pulpitis or apical periodontitis.

From these positions, the main goal of endodontic treatment is to affect the biofilm to reduce the number, eliminate pathogens in the affected tooth and surrounding tissues, as well as to prevent re-infection of the root canal system. In endodontic treatment, a fundamental understanding of the rules for performing the steps of crown and root endodontic preparation of each tooth, adequate disinfection and quality obturation of root canals under X-ray control is mandatory

The facts presented by many scientists show that about 60% of endodontic treatment failures are directly related to incomplete obturation of the root canal system, which is part of the radicular space. And this can further lead to various inflammatory diseases of the maxillofacial region and the formation of focal foci in systemic organs. The complexity of endodontic treatment is that a lot of work must be done on a small space, which is mostly not amenable to visual control. However, along with objective difficulties and failures in the performance of endodontic treatment, it is necessary to know the errors and complications that can occur at the stages of examination, diagnosis, performance of endodontic crown and root preparation, as well as ways to prevent them in order to preserve the function of the tooth and the health of the patient as a whole. In recent years, due to the introduction of new technologies, tools and materials into endodontic practice, positive trends in improving the efficiency of endodontic treatment of teeth have been noted. However, this does not mean that in the clinical practice of a dentist the number of unsuccessful outcomes of treatment of complicated caries has decreased. It is important to emphasize that problem solving in endodontics is closely related to fundamental knowledge and skills. The guarantee of effective endodontic treatment and its prognosis are three components: a good level of oral hygiene, quality mechanical treatment with subsequent obturation of the root canal system and restoration of the anatomical shape of the tooth. Despite the variety of reasons why mistakes are made in endodontic treatment of teeth, they are based on violations of the algorithm of the stages of preparation of the crown part of the tooth and root canals, which leads to the development of complications. The data of radiological studies show that in about 13.4% of cases root canals are filled satisfactorily. It is known that teeth with poorly filled root canals are sources of chronic odontogenic infection that can cause changes of varying severity in other organs. As a rule, this is due, on the one hand, to virulent microorganisms and their toxins, which are located in the affected tubes of the dentin of the tooth root, and on the other hand - the

seepage of tissue fluid from the side of the apical opening. It is as a result of microleakage of decay products through the apical foramen and lateral tubules of the tooth root that foci of inflammation are formed in the surrounding periodontal tissues (periradicular inflammation). The term "pulp space", which includes the pulp chamber of the crown of the tooth and the root canal with all its branches, is essential. The structure of the pulp space may undergo changes due to the deposition of secondary, tertiary denticles and calcifications. It is important to take into account that the pulp and periodontal communication is carried out not only through the main canals, but also through additional tubules (lateral), which can be a reservoir of infection in case of poor antiseptic treatment of the canal or without the use of sitters. In the apical third, as a rule, deltoid branching in the form of additional tubules - the so-called apical delta - is found in the apical third, which should be taken into account to prevent errors in endodontic treatment. In practical endodontics, doctors most often encounter difficulties in the stages of work in the crown part of the tooth and root canals. This is mainly due to the fact that in the domestic literature there is insufficient information about the rules for performing the stages of endodontic crown preparation, there is no information about the characteristic features of each tooth in three projections. Knowledge about the signs of teeth characterizing the first projection, which is determined radiologically, as well as the assessment of anatomo-topographical parameters help to exclude errors in the work at the stages of examination of both crown and root parts of the tooth. To exclude errors in the treatment of complicated caries (pulpitis or apical periodontitis), the endodontic preparation of the crown and root parts of the tooth using appropriate instruments under antiseptic control is of decisive importance. Targeting each step of endodontic preparation helps to prevent errors and complications. From these positions it is necessary to know, understand the purpose and stages of crown preparation, including key issues: preparing access to the roof of the pulp chamber for its complete removal (on the indication of amputation of the crown pulp), the formation of the walls and bottom of the pulp chamber, taking into account the topography of the creation of the main transition to the mouth of the root canal of the tooth (for example, in the form of a triangle or rhombus in upper and lower molars). Mastery of endodontic crown preparation skills for each tooth will undoubtedly help to reduce the risk of potential errors in the subsequent stages of root canal work. It is at the stages of root preparation that errors most often occur due to lack of knowledge of the signs of the teeth of the second projection, which are not radiologically defined.

Therefore, it is necessary to take into account these signs in a thorough examination of all levels of the root canal with a pulpoextractor (extirpation as indicated) with mandatory irrigation. The decisive stage of root preparation is the expansion and formation of the walls of the root canal using appropriate endodontic tools with mandatory irrigation of antiseptics and qualitative obturation (sillers and gutta-percha) under the control of radiography up to the root apex. In general, the correct performance of crown and root preparation contributes to the qualitative obturation of the root system of the tooth, which determines the success in endodontics. The most important condition for achieving positive results in endodontic treatment is the correct preparation of the crown cavity of the tooth with complete removal of the pulp chamber roof, taking into account the anatomo-topographic features of each tooth, and the formation of free access to the root canal. The main requirements for the formed tooth cavity: - there should be no overhanging edges with complete removal of the pulp chamber roof; the walls of the pulp cavity are formed with a smooth transition to the root part of the tooth for favorable work with instruments; - examination of the bottom of the pulp cavity allows you to find the mouths of root canals, taking into account the topography of the teeth. Violation of the rules of endodontic preparation of crown and root parts, without the use of radiographs and without taking into account the anatomo-topographical parameters of each tooth, as well as the wrong choice of instruments can lead to errors and complications. Often perforation can occur in the area of bifurcation of lower molars when violating the stages of crown preparation and without examination of the bottom of the pulp chamber. Clinically, probing in the area of perforation also causes acute pain. However, an apex locator and X-ray should be used to diagnose the perforation more accurately. The best prognosis is if the perforation is closed immediately, minimizing trauma and infection of the surrounding tissues. The main conditions for the prevention of perforations: - compliance with the rules and principles of endodontic crown and root preparation, taking into account the features of the tooth in three projections; - correct performance of all stages of crown preparation to ensure good access to the mouths of the volume of anatomo-topographical features of the teeth; - taking into account the inclination of the crown of the tooth, its displacement, anatomical features, radiological control; - the choice of appropriate endodontic instruments; - indispensable removal of the artificial crown of the tooth before endodontic treatment. Prevention of root perforations When treating severely curved root canals it is necessary: - mandatory preliminary radiologic study of the configuration of root

canals; - giving hand instruments a bend corresponding to the curvature of the root (in this case, their directions should coincide); - use of anticurvature technique of passage with Safety Hedstroem files (Kerr) - H-file with one-sided smooth surface of the working part; - use of special instruments (flexible files, profiles, etc.) made of nickel-titanium steel for effective passage of narrow calcified root canals; - constant radiologic examination of the root canals. Unfortunately, it is not uncommon to encounter the following problems in practice: - discoloration of the tooth crown - occurs due to partial opening of the pulp cavity cap of the tooth (after pulpitis treatment is completed, even with high-quality obturation of the canal); - breakage of the root canal instrument - occurs with insufficiently formed access to the root canal, which makes it difficult to work with endodontic instrumentation and violation of coronal-apical technique; - poor-quality filling of the canal - may occur with violation of the technique of root canal preparation at all its levels (cervical, medial and 1/3 Practically important when performing the stages of work in endodontics: - take a radiologic image before preparation; - observe the maximum angle of rotation of the instrument in the canal: K-rimers - 180 °, K-files - 90 °, with narrow curved canals the angle of rotation is recommended to reduce to 20-30 °. H-files can not be rotated; - when indicated, use gels to expand root canals; - timely discard unusable instruments. When working with files (ProfillFlexMaster, ProTaper, etc.) to determine the length of the canal use measuring devices - DentaPORT, Raypex5 and repeat the radiograph. In conclusion, it is necessary to emphasize the main classical standards of endodontics that contribute to a favorable prognosis: - professional oral hygiene (periodic motivation and cleaning of sextants) - exposure to pathogenic microflora (biofilm); - adequate diagnosis of the affected tooth with evaluation of the surrounding tissues and work with cofferdam; - compliance with the technique of endodontic preparation (crown and root) taking into account the characteristic features of teeth in three dimensions and age-related features; - selection of appropriate endodontic instruments and antiseptics for irrigation; - root preparation at all levels of the root canal with appropriate endodontic instruments (a certain type of FlexMaster) and performance of coronal-apical and apical-coronal techniques with abundant irrigation with antiseptics; - for narrow and curved roots, nickel-titanium files (NiTi) are more often used - ProfillFlexMaster, Reamer-type, ProTaper, etc. with obligatory irrigation with antiseptics; antiseptics Calcium hydroxide, Sodium hydrochloride (0.5-5%), Chlorhexidine (0.2%), etc. are used for disinfection. - dense obturation at all levels of the root canal (appropriate sillers and lateral condensation of gutta-

percha) with the use of an apex-locator and radiologic control with the final qualitative restoration of the tooth; - dynamic observation of the oral cavity ecosystem and radiologic control (in 1-3 years) after endodontic treatment; - control visits to the dentist to maintain oral health (correction of OHI-S, KPI, KPU, etc.). Assessment of endodontic treatment quality and prognosis is carried out according to clinical and radiologic signs: - there are no symptoms in the patient; - the patient should be taught the rules of oral care; - OHI-S, CRPI, CPPU indices should be corrected; - root canals should be filled to the apex (in apical periodontitis) or to the physiologic opening (in certain forms of pulpitis) on radiographs

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