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MODERN ASPECTS OF DISSECTION IN DENTISTRY

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Introduction

The prevalence of dental caries in Russia is very high and reaches 99%. Currently, the treatment of caries is reduced to excision of the affected tissues and prosthetics of the defect with filling materials. Pretreatment is the most time-consuming stage, the features of which depend on the location of the carious cavity (KP), the volume of the lesion and the group to which the teeth belong, the state of oral hygiene, the aesthetic requirements of the patient and the properties of the filling material. Improving the quality and efficiency of dental preparation is one of the key problems of modern dentistry, the solution of which leads to a decrease in the incidence of caries and the cost of repeated treatment [9, 10, 14, 31]. In recent years, demineralization has become more understandable, as well as the possibilities of remineralization of tooth tissues during the removal and treatment of caries; the surgical approach of creating a box-shaped cavity proposed by Black is not suitable today due to the spread of minimal interventional dentistry. The modern concept is based on the identification of the initial lesion for preventive measures, and surgical intervention is necessary only in the presence of a carious cavity. Given the possibility of remineralization, it is necessary to preserve as much natural tissue as possible and minimize further damage to the tooth. In recent years, the literature has actively promoted the use of dental-preserving treatment methods by creating "tunnels", "bridges", etc. [8, 12, 13, 29]. According to other authors, one can only partially agree with the "minimally invasive" approach to CP dissection. It is justified with small cavity sizes in patients with a "healthy" oral cavity and a low incidence of caries (CPI index < 5) [15]. There are a number of factors that can cause local and systemic complications during odontopreparation. Common factors include stress, psychoemotional stress, pain, cardiovascular and neuroendocrine dysfunction, allergic reactions and infected aerosol clouds. Local complications include mechanical and thermal trauma, vibration, and microbial invasion [21, 28]. Rotating tools (boreholes, milling cutters) have not undergone fundamental changes. Diamond boreholes are considered more effective for reducing cracks and chipping of enamel. However, their disadvantage is the rough surface. In addition, when working with dentin, organic substances clog the gaps between the diamond grains, therefore, during necrotomy, carbide bars with a small number of blades are used, diamond bars for the main stages of KP formation and carbide bars with a large number of faces (finia) for the final stage, diamond bars with red markings, or ceramic abrasives are better [7, 12]. Even with an optimal choice of a bar and an increase in the preparation speed, the kinetic energy transferred by the tool to the tooth turns out to be excessive and unevenly distributed over the surface. This leads to heating of the tooth tissues, microcracks of enamel and dentin, vibration and noise, and also causes negative sensations in the patient. The temperature rise reaches 225-257°C when using diamond burners without cooling and 300-320°C when using metal burners. This causes irreversible

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changes in tissues: destruction of tartar, dilation of blood vessels, hemorrhage into the pulp, infiltration by round cells and predentin necrosis. Violation of the preparation technique leads to asymptomatic pulpitis in 40-60% of cases, and the pulp is the main vector of cross-infection due to the presence of infected dentin [2, 3, 6, 12, 23]. The analysis of traditional methods of preparation (COSRE test, acid biopsy of enamel, X-ray spectral microanalysis and scanning electron microscopy) revealed a significant decrease in calcium content and a tendency to decrease phosphorus content in the surface layer of enamel, which is a negative sign [9, 10, 22]. The disadvantages of traditional treatment methods have led to the need to develop new types of dental tissue treatment methods that minimize the destruction of the tooth structure. At the same time, the development goes in two directions: 1) improvement of techniques and tools for traditional preparation; 2) development of alternative techniques: chemomechanical, laser, ultrasonic, aero- and aquabrash methods [1, 8, 25]. The method of chemical-mechanical preparation (atraumatic technique: ART method) is a chemical-mechanical treatment of CP. In this case, a gel based on organic acids and sodium hypochlorite is placed in the tooth cavity. As a result, carious dentin coagulates and softened tissues are removed with hand-held cutting tools. The mixture is instantly inactivated and does not cause chemical injury to healthy dentin. The treated KP is sealed only with glass ionomer cement. The advantages of the inexpensive ART technique are that it is minimally invasive, painless and allows you to preserve healthy tissues. This technique is indicated in childhood, when the fear of a drill is inevitable, as well as in patients with severe physical and mental pathologies. The disadvantages include the required time compared to the treatment with a milling cutter, the potentially harmful effect of the gel on the pulp and the inability to use a composite resin [1, 14, 20, 32]. ErYAG lasers (erbium, yttrium, aluminum, garnet) with a wavelength of 2940 nm are suitable for the formation of orbital cavities. Such waves are absorbed by water, so it is effective for selective removal of carious tissues. Hitting solid tissues in a pulsed mode, the laser beam heats the water contained in them so that it "explodes", causing micro-destruction in enamel and dentin with the removal of solid fragments by steam. However, tissues located in the immediate vicinity of the area of action of water vapor are heated by no more than two degrees: the laser energy is practically not absorbed by hydroxyapatite [19, 25, 30, 31]. After laser dissection, there are no chips or scratches in the cavity. Electron microscopy revealed a compaction of the enamel structure, hydroxyapatite crystals had no distinct boundaries, interprism spaces and their contents were not visible. The absence of a "greased layer" gives a clean surface that does not need etching. The microflora dies under the action of the laser, which minimizes the risk of cross-infection. At the same time, the CP does not need antiseptic treatment. The laser is acceptable for small lesions with direct access. Dissection of larger cavities can be time-consuming and time-consuming. The procedure is painless, since there is no strong heating of the tooth and the duration of the laser pulse is approximately 200 times less than the time threshold for pain perception [17, 19, 30]. In recent decades, oscillating instruments have become widespread, which include air and piezoelectric scalers that create vibrations with a sound (7000 Hz) and ultrasonic (up to 35000 Hz) frequency. Special nozzles with diamond chips of various shapes and sizes (EMS, NSK, Acteon) are used for preparation [1, 9]. The preparation of hard tooth tissues by ultrasound (ultrasound) has a number of advantages. The working

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pressure of the tip is lower, the heating of the tooth is insignificant compared to the preparation of borons. The absence of rough vibration and relatively little heat generation provides a low-pain sensation. Studies of tooth grinds with sections of ultrasound preparation under a microscope showed that the walls of the CP appeared to be finely toothed, without cracks and destruction of enamel prisms and dentine tubules. Studies of the pulp reaction have shown the absence of its necrosis and changes in the structure of odontoblasts. At the same time, reversible vascular hyperemia and pulp edema were noted. Currently, it has been proven that when CP is treated with ultrasound, only softened demineralized enamel and dentin are removed and healthy tooth tissues are not affected, which corresponds to the principle of biological expediency [1, 9]. The technique of kinetic air-abrasive preparation consists in the ultrafine destruction of tissues by a point-focused flow of small particles of aluminum oxide powder (27 and 50 microns), which is accelerated to 600 m/s using air-abrasive devices (Sandman Futura, Mach4.0 (Quintronix)). The air-abrasive method has a number of advantages: painless non-contact preparation with preferential removal of only affected tissues, which eliminates vibration, overheating of tissues, reduces the risk of microtrauma, chips and cracks in enamel and dentin, makes it possible to dissect ultra-small cavities and deep cleansing of fissures without opening them. The treated surface remains dry, rough, and a thick lubricated layer is not formed, thereby increasing the effectiveness of adhesive systems [2, 9, 11, 16,]. However, this technique has some disadvantages, such as mechanical contamination and bacterial contamination of the workplace, as well as minor blockage of the dentine tubules with dust [18]. The water-abrasive method of minimally invasive intervention was approved and recommended by the FDI in 2002, and in 2007 it was approved for wide practical use in Russia. The inclusion of water in the process minimizes dust formation and increases cutting efficiency compared to air abrasion. For water-abrasive preparation of teeth, aluminum oxide powder (27, 29, 53 microns) is used - a stable, non-toxic, inert substance. The effect is enhanced by a jet of water, which takes the shape of a bell around the air jet, causing additional effects: reduction of dust formation and flushing. Water-abrasive devices: AirFlow Prep K1 (EMS), Aquacut uattro (VELOPEX by Mediv- 129 ance Instruments Ltd.), RONDOflex tip (KaVo) [2, 14]. In the treatment of fissure caries, the water-abrasive method provides full-fledged cleaning with the creation of a local rough enamel surface without a greased layer. This creates conditions for ideal microretence when working with modern composites without additional etching. The treatment does not involve local anesthesia, does not cause overheating and preserves healthy tooth tissues as much as possible. Dynamic monitoring of the results of treatment using the water-abrasive method showed its effectiveness, the absence of relapses and complications in the long term. After dissection, scientists found no changes in the mineral metabolism and microstructure of enamel and dentin, and enamel remineralization occurred 1.52 times faster than when exposed to borons [2, 9, 10, 22]. However, in KP, there may be limitations in the application of the method on the contact surfaces due to the characteristics of the tip. In such situations, the authors recommend using a combined treatment: opening the cavity and removing detritus using borons, and the final preparation of the KP with an abrasive aerosol. Water-abrasive preparation usually does not cause stress, on the contrary, it has a beneficial effect on patients of any age [2, 9, 10]. To date, the issue of the quality of the edge fit of fillings

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after preparation is little studied. According to electrometry data, preparation with borons with an optimal degree of granularity of the diamond coating ensures a strong edge fit of the filling material to the tooth tissues both immediately after filling (from 0.93±0.07 to 1.06±0.06 μA) and after 18 months (from 1.32±0.09 to 1.55±0.14 μA) [5, 4]. The method of air abrasion significantly increases the bond strength of the adhesive material with the surface of the KP [18].

Conclusion:

According to other authors, the adhesion of the filling material does not depend on the preparation method, but there is a relationship between the quality of the adhesive system used and the degree of adhesion of the filling material [24]. The use in clinical practice of each of the above types and methods of odontopreparation should be justified by a comprehensive scientific study of their effect on the condition of hard and soft tissues of the tooth, periodontal tissues using generally accepted clinical techniques and the results of modern high-tech methods that take into account the peculiarities of the microstructure of hard tissues.

References:

1. Marjona T. OPTIMIZATION AND IMPROVEMENT OF CARIES TREATMENT IN THE FIELD OF PERMANENT TEETH FISSURES IN CHILDREN //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 10. – C. 78-84.
2. Ruziyeva K. A., Burhonova Z. K. K. Complex Application Of Magnetic Laser Therapy And Propolis Tincture For The Prevention And Treatment Of Chronic Recurrent Aphthous Stomatitis //The American Journal of Medical Sciences and Pharmaceutical Research. – 2021. – T. 3. – №. 06. – C. 127-130.
3. Sevinch E., Zarafruz B. ETIOLOGICAL TREATMENT FEATURES INFLAMMATORY PERIODONTAL DISEASE //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 03. – C. 241-246.
4. Zarafruz K. S. B. THE ROLE OF ORAL CAVITY MICROORGANISMS IN THE DEVELOPMENT OF INFLAMMATION AND SOMATIC PATHOLOGY //International journal of advanced research in education, technology and management. – 2024. – T. 3. – №. 8. – C. 192-202.
5. Yusufboy S., Qobilovna B. Z. STUDY THE EFFECT OF HYGIENIC CARE ON THE MICROBIAL LANDSCAPE OF THE ORAL CAVITY IN PATIENTS USING COMBINED SPLINTING STRUCTURES WITH MODERATE PERIODONTITIS //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 02. – C. 50-55.
6. Yusufboy S., Qobilovna B. Z. FEATURES OF THE STRUCTURE OF COPD IN ELDERLY PATIENTS //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 05. – C. 363-368.
7. Sevinch E., Qobilovna B. Z. A STUDY ON THE MORPHOFUNCTIONAL STATE OF ORAL ORGAN TISSUES DURING THE USE OF NON-REMOVABLE ORTHODONTIC STRUCTURES

ISSN: 2776-1010 Volume 5, Issue 12, December 2024

//European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 03. – C. 247-253.

8. Shaximardonova E. S., Kobilovna B. Z. RED LICHEN PLANUS OF THE ORAL MUCOSA AND ITS CLINICAL ANALYSIS OF A PATIENT WITH, ASSOCIATED WITH THE EPSTEIN—BARR VIRUS //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 01. – C. 272-279.
9. Yusufboy S., Qobilovna B. Z. STUDY OF CHANGES IN THE ORAL CAVITY IN ENDOCRINE DISEASES //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 05. – C. 357-362.
10. Yusufboy S., Qobilovna B. Z. STUDY OF CHANGES IN THE ORAL CAVITY IN ENDOCRINE DISEASES //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 05. – C. 357-362.
11. Yusufboy S., Qobilovna B. Z. SMARTBURS II–A REVIEW OF THE ADVANTAGES OF SMART BOR //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – T. 4. – №. 02. – C. 56-60.
12. Makhmudovna T. M. et al. THE COURSE OF MALFORMATION AND CORNEAL EROSION IN TUBERCULOSIS PATIENTS //Open Access Repository. – 2023. – T. 4. – №. 03. – C. 60-66.
13. Dilafruz K. ROOT CANAL PREPARATION AS A STAGE OF TOOTH RESTORATION //International journal of advanced research in education, technology and management. – 2024. – T. 3. – №. 9. – C. 100-107.
14. Dilafruz K. COMPREHENSIVE TREATMENT GENERALIZED PERIODONTITIS AND CLINICAL AND RADIOLOGICAL EVALUATION OF EFFECTIVENESS //International journal of advanced research in education, technology and management. – 2024. – T. 3. – №. 9. – C. 108-116.