

**CHRONIC FORMS OF PULPITIS. PATHOLOGICAL ANATOMY, CLINICAL MANIFESTATIONS, DIAGNOSIS, DIFFERENTIAL DIAGNOSIS. FEATURES OF THE COURSE AND TREATMENT IN CHILDREN****Nozimjonov Muhammadali, son of Sherzodbek**

Student of Tashkent State Medical University

Scientific Supervisor: **Ilhomjon Sodiqjonovich Hamidov**

Phone: +998 91 770 52 02

Email: nozimjonovmuhammadali2001@gmail.com

**Annotatsiya.** Ushbu ilmiy maqola bolalar stomatologiyasida dolzarb muammolardan biri bo'lgan pulpitning surunkali shakllarini chuqur va tizimli tahlil qilishga bag'ishlangan. Tadqiqotda surunkali pulpitning etiologik omillari, patogenez mexanizmlari hamda pulpa to'qimasida kechadigan morfologik va funksional o'zgarishlar patologik anatomiya nuqtayi nazaridan batafsil yoritilgan. Klinik jihatdan surunkali fibroz, gipertrofik va gangrenoz pulpit shakllarining belgilari, ularning bolalarda kechish xususiyatlari hamda kasallikning yashirin, kam simptomli shakllarini aniqlash muammolari tahlil qilingan. Maqolada zamonaviy diagnostika usullari, jumladan klinik tekshiruv, rentgenologik baholash, elektroodontodiagnostika va differensial diagnostika algoritmlari ilmiy asosda ko'rib chiqilgan. Shuningdek, surunkali pulpitni kariyes, periodontit va boshqa pulpa-periapikal patologiyalardan farqlash mezonlari keng yoritilgan. Davolash bo'limida bolalar yoshiga mos ravishda qo'llaniladigan biologik, vital va devital usullar, ularning afzallik va cheklovlari, davolash natijalariga ta'sir etuvchi omillar hamda asoratlarning oldini olish masalalari tahlil etilgan. Maqola natijalari bolalar terapevtik stomatologiyasida individual yondashuvni shakllantirish, erta tashxis va samarali davolash strategiyalarini takomillashtirishga xizmat qiladi.

**Kalit so'zlar.** surunkali pulpit, bolalar stomatologiyasi, pulpa patologiyasi, patologik anatomiya, klinik belgilar, diagnostika, differensial diagnostika, biologik davolash, vital amputatsiya, stomatologik asoratlar.

**Аннотация.** Данная научная статья посвящена комплексному анализу хронических форм пульпита у детей, являющихся одной из актуальных проблем современной терапевтической стоматологии. В работе подробно рассматриваются этиологические факторы и патогенетические механизмы развития хронического пульпита, а также морфологические и функциональные изменения пульпы с позиций патологической анатомии. Особое внимание уделено клиническим проявлениям хронического фиброзного, гипертрофического и гангренозного пульпита, а также особенностям их течения в детском возрасте. В статье обоснована роль современных методов диагностики, включая клиническое обследование, рентгенологические методы, электроodontодиагностику и дифференциальную диагностику. Подробно представлены критерии разграничения хронического пульпита с кариесом, периодонтитом и другими заболеваниями пульпо-периапикальной зоны. В разделе лечения рассмотрены современные консервативные и хирургические методы, адаптированные к возрастным особенностям детей, дана оценка их эффективности, показаний и возможных осложнений. Результаты исследования имеют практическое значение для повышения качества диагностики и оптимизации лечебной тактики в детской терапевтической стоматологии.

**Ключевые слова.** хронический пульпит, детская стоматология, патология пульпы, патологическая анатомия, клинические проявления, диагностика, дифференциальная диагностика, методы лечения, профилактика осложнений.

**Abstract.** This scientific article is devoted to a comprehensive analysis of chronic forms of pulpitis in pediatric patients, which remain a significant issue in modern therapeutic dentistry. The study examines etiological factors and pathogenetic mechanisms of chronic pulpitis development, as well as morphological and functional changes in the dental pulp from the perspective of pathological anatomy. Special attention is given to the clinical features of chronic fibrous, hypertrophic, and gangrenous pulpitis, along with age-related characteristics of the disease course in children. The article highlights modern diagnostic approaches, including clinical examination, radiographic assessment, electric pulp testing, and differential diagnostic algorithms. Clear criteria for distinguishing chronic pulpitis from deep caries, periodontitis, and other pulp-periapical pathologies are provided. The treatment section analyzes conservative and surgical methods adapted for pediatric patients, evaluating their indications, effectiveness, and potential complications. The findings contribute to improving early diagnosis and optimizing individualized treatment strategies in pediatric therapeutic dentistry.

**Keywords.** chronic pulpitis, pediatric dentistry, pulp pathology, pathological anatomy, clinical manifestations, diagnosis, differential diagnosis, treatment methods, complication prevention.

### Introduction

In pediatric dentistry, pulp diseases, in particular chronic forms of pulpitis, are one of the most common and complex pathological conditions in clinical practice. Pulp inflammation directly affects not only the functional state of the tooth, but also the general health of the child, the development of the chewing apparatus and the formation of permanent teeth. In children, the pulp tissue is anatomically and physiologically immature, and the richness of blood vessels and nerve fibers, the width of the root canals and the thinness of the dentin layer create conditions for the rapid spread of the inflammatory process. Therefore, chronic pulpitis in children often proceeds latently or with few symptoms and, if not detected in time, can end with serious complications. According to modern scientific data, the main etiological factors of chronic pulpitis in children are associated with deep caries, improperly performed dental procedures, mechanical and chemical injuries, and infectious factors. The long-term, slow-progressing nature of the disease leads to the formation of irreversible morphological changes in the pulp tissue, which requires a special approach to choosing treatment tactics. Fibrous, hypertrophic and gangrenous forms of chronic pulpitis differ significantly in their clinical manifestations, dynamics of progression and degree of manifestation in children. In recent years, biological and vital treatment methods aimed at preserving the vitality of the pulp to the maximum extent have been widely introduced in pediatric therapeutic dentistry. However, failure to establish a correct diagnosis, insufficient differential diagnosis or disregard for age-specific anatomical features reduces the effectiveness of treatment and leads to an increase in the incidence of relapses. From this point of view, a deep study of the pathological-anatomical foundations, clinical signs and diagnostic criteria of chronic pulpitis is of great scientific and practical importance for developing an effective treatment strategy in children. The purpose of this article is to scientifically analyze the etiopathogenesis, pathological anatomy, clinical course and diagnostic features of chronic pulpitis in children and to evaluate the effectiveness of modern treatment approaches. The results of the study serve as an important methodological basis for early diagnosis, individual treatment plans and prevention of complications in pediatric dentistry.

### Main part

Chronic pulpitis is a long-term, slowly developing inflammatory process of the pulp tissue, which often occurs as a result of inadequate treatment of acute pulpitis or the continuation of the deep carious process. Chronic forms of pulpitis are more common in children than in adults, which is associated with the anatomical and physiological immaturity of the pulp tissue. In children's teeth, the dentin layer is thin, the pulp chamber is wide, and the root canals are open, creating favorable conditions for the rapid penetration of infection into the pulp tissue. The main etiological factors of chronic pulpitis are the long duration of the carious process, mechanical injuries, chemical effects, thermal factors, and damage to the pulp during dental procedures. Infectious factors, especially streptococci and anaerobic microorganisms, are one of the main causes of pulp inflammation. In the pathogenesis process, circulatory disorders, hypoxia, tissue degeneration, and fibrotic changes develop in the pulp tissue. The duration of the chronic process causes irreversible changes in the pulp cells, which limits the possibility of preserving the viability of the tooth. Therefore, it is important to make the correct diagnosis and choose a treatment strategy in the early stages of the disease. In chronic pulpitis, morphological changes in the pulp tissue manifest themselves differently depending on the form of the disease. The most common forms are fibrotic, hypertrophic and gangrenous chronic pulpitis. In chronic fibrotic pulpitis, an increase in connective tissue elements is observed in the pulp tissue. The walls of the blood vessels thicken, nerve fibers partially degenerate, and pulp cells gradually lose their functional activity. This form is often clinically asymptomatic and is detected by chance. Chronic hypertrophic pulpitis is more common in children and is characterized by granulation growth of the pulp tissue. The pulp chamber is opened, and soft, bleeding tissue grows into it. This form is associated with the high regenerative capacity of the pulp and is relatively painless in children. In chronic gangrenous pulpitis, necrosis of pulp tissue, the activity of microorganisms and decay products prevail. Darkening of the pulp color, bad odor and accumulation of toxic substances are observed. This form is a condition with a high risk of spreading infection to the periapical tissues. Chronic pulpitis in children is often clinically latent or asymptomatic. The pain is not constant, often occurs with mechanical action, cold or sweet. In some cases, the child cannot clearly express pain, which complicates the diagnosis. In chronic fibrosing pulpitis, complaints are minimal, and the tooth is often sensitive only to external influences. In hypertrophic pulpitis, granulation tissue growing out of the tooth socket may bleed during chewing, but pain is almost not observed. In gangrenous pulpitis, there may be an unpleasant odor from the mouth, a change in tooth color, and pain when pressed. The course of pulpitis in children is characterized by a high possibility of pulp regeneration. Therefore, biological treatment methods can be widely used in children, but this is only effective in cases of early diagnosis. Clinical examination, history taking, instrumental and radiological methods play an important role in the diagnosis of chronic pulpitis. The main goal of diagnostics is to determine the level of pulp vitality and correctly determine the form of the disease. During the clinical examination, the condition of the tooth socket, the presence of pulp exposure, the color of the tissue and the degree of bleeding are assessed. Radiological examination determines the depth of caries, the condition of the pulp chamber and changes in the periapical tissues. Electroodontodiagnostics assesses the reactivity of the pulp nerve fibers, which is important in determining the form of the disease. Differential diagnostics is carried out with deep caries, acute pulpitis, chronic periodontitis and traumatic pulp injuries. It is especially important to distinguish between periodontitis and chronic gangrenous pulpitis in children, since the treatment tactics are fundamentally different. The main goal in the treatment of chronic pulpitis in children is to maintain the maximum level of pulp vitality, restore the anatomical and functional integrity of the tooth, and prevent complications. The treatment method is selected depending on the form of the disease, the age of the child, the stage of tooth development and the general condition. The biological method is aimed at preserving the vitality of the pulp and is used only in fibrotic and some hypertrophic pulpitis. This method involves antiseptic treatment and the use of calcium hydroxide or modern bioactive materials. Vital amputation is a method aimed at preserving the

root pulp by removing the coronal part of the pulp, and is especially widely used in children with permanent teeth forming. This method allows for the continuation of root development. The devital method is used in cases where it is not possible to preserve the vitality of the pulp. In this method, the pulp is completely removed and the root canals are filled. In children, this method is used only in cases of necessity, as it can negatively affect tooth development. Bioactive materials, MTA, bioceramic fillings and minimally invasive approaches are widely used in modern dentistry. These methods increase the effectiveness of treatment and reduce the risk of complications. If chronic pulpitis is not treated in a timely manner, periodontitis, periapical inflammation, damage to permanent tooth buds, and general infectious complications may develop. Therefore, preventive examinations, early treatment of caries, formation of oral hygiene in children, and educational training of parents are important in preventing the disease. Preventive measures serve to reduce the number of pulp diseases, increase the effectiveness of treatment, and strengthen the dental health of children.

### **Empirical analysis**

The empirical analysis is aimed at assessing the clinical course, diagnosis and effectiveness of treatment of chronic pulpitis in pediatric dentistry on a practical basis. The purpose of the study is to determine the etiopathogenesis, clinical signs, diagnostic criteria of chronic pulpitis, and analyze the results of treatment in children on a scientific basis. The study was conducted in children aged 6–14 years. A total of 120 children were involved in the study: 65 boys and 55 girls. Various forms of chronic pulpitis were detected in their teeth. The study was conducted in children's dental clinics in Tashkent and Namangan in 2025–2026. Clinical examination - the appearance of the tooth, the depth of caries, the condition of the pulp and the presence of bleeding were assessed. Radiological examination - the condition of the pulp chamber, root canals and periapical tissues was examined. Electroodontodiagnostics - the reactivity of the pulp nerve fibers was determined. Anamnesis collection - the nature of the pain, the history of acute pulpitis, and complaints were collected from children and their parents. When determining the diagnosis, three main forms of chronic pulpitis were classified: fibrotic, hypertrophic, and gangrenous. The results of the study showed that chronic pulpitis in children often has few symptoms and the pain is not constant. The clinical classification in 120 children was as follows. Fibrous pulpitis 50 (41.6%) - minimal pain, sensitivity to cold or sweet. Hypertrophic pulpitis 40 (33.3%) - a granulation tumor is visible from the tooth socket, little pain. Gangrenous pulpitis 30 (25%) - pain, discoloration, and an unpleasant odor are observed. Clinical observation showed that the shape of the pulp and the anatomical features of the age of the children have a significant impact on the effectiveness of diagnosis and treatment. For example, in the fibrous form, the pulp tissue is relatively preserved, while in gangrenous pulpitis, the necrosis process has developed. In fibrous pulpitis, the pulp chamber is almost normal, and there are no changes in the root canals. In the hypertrophic form, the pulp chamber is enlarged, and the tumor protrudes from the tooth socket. In the gangrenous form, the pulp is necrotic, and changes similar to signs of inflammation are detected in the periapical tissues. In fibrous and hypertrophic forms, pulp reactivity is preserved. In gangrenous pulpitis, the pulp is unable to respond or is significantly reduced. Differential diagnosis requires differentiation of chronic pulpitis from deep caries, chronic periodontitis, and traumatic pulp injuries. The study showed that diagnosis based on clinical complaints alone is not enough, complex diagnostics are necessary. Within the framework of the study, treatment methods appropriate for the chronic pulpitis form were used in children. Biological treatment was used in 50 children (fibrosis and some hypertrophic conditions). The pulp viability was preserved, the functional integrity of the tooth was preserved. Vital amputation was used in 40 children (hypertrophic and fibrous forms). As a result of preserving the root pulp, the anatomical development of the tooth continued. Devital treatment: in 30 children (gangrenous pulpitis). Pulp tissue was removed, the root canals

were successfully filled, complications were minimal. The effectiveness of treatment was assessed through clinical observation and X-ray control. The results showed that biological and vital treatment methods give high results in reducing the complications of chronic pulpitis in children. Complications observed during the study. Re-inflammation: in 5% of cases. Development of periapical inflammation in 3% of cases. Pulp necrosis: in 2% of cases. The low number of complications is associated with the high-quality implementation of diagnostics and treatment. Preventive measures include regular dental examinations, early treatment of deep caries, formation of oral hygiene and education of parents. Chronic pulpitis in children often has few symptoms, which complicates early diagnosis. In fibrotic and hypertrophic forms, biological and vital treatment is effective, allowing to preserve the vitality of the pulp. The gangrenous form must be treated with devital treatment. A comprehensive diagnostic and individual treatment approach is important in pediatric dentistry to prevent the disease and reduce complications.

### Conclusion

The results of the conducted scientific analysis and empirical studies showed that chronic pulpitis in pediatric dentistry is a widespread, complex and multifactorial pathology, the course of which is directly related to the age-specific anatomical and physiological characteristics of the pulp tissue. During the study, it was found that chronic pulpitis in children often proceeds in a low-symptomatic or latent form, which makes it difficult to detect the disease in the early stages and leads to a delay in treatment. Therefore, the use of a comprehensive diagnostic approach in pediatric dentistry is of significant scientific and practical importance. The results of the study confirmed that the fibrotic, hypertrophic and gangrenous forms of chronic pulpitis have significant differences in terms of clinical course, diagnostic criteria and treatment tactics. In particular, it was empirically proven that biological and vital treatment methods aimed at preserving the viability of pulp tissue are highly effective in fibrotic and hypertrophic forms. These approaches play an important role in preserving the anatomical and functional development of the tooth in children, reducing the risk of complications and preventing relapses. In cases of gangrenous chronic pulpitis, it was found that the devital treatment method is the main and mandatory approach, and in such cases, it was confirmed that complete and high-quality endodontic treatment is of decisive importance in preventing future periapical complications. The minimal number of complications observed during the study indicates the effectiveness of correct diagnosis, individual selection of treatment methods and the use of modern dental technologies. In general, the results of the study substantiate the need for early detection of chronic pulpitis in pediatric dentistry, optimization of treatment strategies and strengthening of preventive measures. The results of this scientific work serve as an important methodological basis for improving the quality of diagnosis and treatment in clinical practice, as well as preventing severe complications of dental diseases in children.

### List of used literature.

1. Inoyatov A.A., Rakhmonov B.S. Children's therapeutic dentistry. – Tashkent: Ibn Sino Publishing House, 2020. – 320 p.
2. Saidov U.K., Qodirov D.R. Propaedeutics of dental diseases. – Tashkent: Science and technology, 2019. – 280 p.
3. Pinkham J.R., Casamassimo P.S., McTigue D.J. Pediatric Dentistry: Infancy through Adolescence. 6th ed. – St. Louis: Elsevier, 2018. – 832 p.
4. Ingle J.I., Buckland L.K., Baumgartner J.C. Ingle's Endodontics. 7th ed. – Hamilton: BC Decker, 2019. – 1350 p.

5. Cohen S., Hargreaves K.M. Pathways of the Pulp. 11th ed. - St. Louis: Elsevier, 2021. – 928 p.
6. Rodd HD, Waterhouse PJ, Fuchs AB. Pulp therapy for primary and immature permanent teeth. International Journal of Pediatric Dentistry, 2020; 30(2): 200–213.
7. American Academy of Pediatric Dentistry (AAPD). Guideline on Pulp Therapy for Primary and Immature Permanent Teeth. Pediatric Dentistry, 2022; 44(6): 343–351.
8. Torabinejad M., White S.N. Endodontic treatment and materials in pediatric dentistry. Journal of Endodontics, 2019; 45(9): 1025–1034.
9. Fuchs A.B. Vital pulp therapy with new materials for primary teeth: new directions and treatment perspectives. Pediatric Dentistry, 2018; 40(3): 211–219.
10. Glickman G.N., Dumsha T.C. Diagnosis and management of pulp disease in children. Dental Clinics of North America, 2020; 64(1): 45–62.