

## **CARIOUS CAVITY AND ITS COMPLICATIONS IN CHILDREN: FROM CARIES TO PERIODONTITIS**

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**Keulimzhaeva Zebiniso Aibekovna**  
*KIMYO International University In Tashkent*  
*2nd-year student*  
*zebinisokeulimzhaeva@gmail.com*

**Mirkhayidov Miraziz Mirkholikovich**  
*Head of the Department of Therapeutic*  
*Dentistry KIUT*  
*mirkhayidov91@gmail.com*

### **Abstract**

Dental caries in children remains one of the most prevalent oral diseases and frequently leads to the formation of a carious cavity. In the absence of timely treatment, the process is complicated by inflammation of the pulp and periodontal tissues. This article examines the causes and specific features of caries development in children, analyzes complications in the form of periodontitis, and outlines approaches to diagnosis and treatment. Additional attention is given to psycho-emotional aspects, particularly the application of play-based techniques as a means of reducing anxiety in pediatric dental patients.

### **Keywords**

caries, carious cavity, periodontitis, pediatric dentistry, play-based methods, prevention.

Dental diseases in children remain a pressing issue both in Russia and worldwide. According to WHO data, 60–90% of school-aged children show signs of carious lesions. The process in children progresses more rapidly due to anatomical and physiological features: thin enamel, porous dentin, and high tissue permeability. What parents often describe as a “hole in the tooth” is already an advanced pathological stage. Caries not only affects general health but also leads to complications such as pulpitis and periodontitis, which can cause premature tooth loss, malocclusion, and even damage to the developing permanent tooth buds.

**Carious Cavity: Causes and Mechanism of Development** The formation of a cavity is linked to the activity of oral microorganisms. During carbohydrate metabolism, they produce acids that lower the pH and initiate enamel demineralization. In children, this process is accelerated by:

- low mineralization of enamel;
- frequent consumption of sweets and sugary drinks;
- irregular oral hygiene;
- insufficient parental awareness of dental health. If the initial stage (white spot) remains undetected, a carious cavity develops rapidly.

Quick Reference: Classification by depth

- Superficial caries – limited to enamel; minimal symptoms.
- Moderate caries – involves dentin, sensitivity to stimuli appears.
- Deep caries – lesion approaches the pulp; pain is pronounced.

Quick Reference: Classification by localization

- Fissure caries – located on occlusal surfaces.
- Approximal caries – between teeth, often invisible without radiographs.
- Cervical caries – at the gingival margin, frequently associated with poor hygiene.

Periodontitis as a Complication of Caries Untreated cavities allow infection to progress deeper, causing pulpitis and subsequently periodontitis. Forms of periodontitis:

- Fibrous – chronic low-grade inflammation with fibrous tissue changes.
- Granulating – active inflammation with granulation tissue and fistula formation.
- Granulomatous – periapical granuloma or cyst-like formations, often asymptomatic.

Quick Reference: Acute vs. chronic periodontitis

- Acute – severe pain, swelling, impaired mastication.
- Chronic – mild complaints, slow tissue destruction, frequently diagnosed only radiographically. For children, chronic forms are especially insidious as they may remain unnoticed until significant damage has occurred.

Diagnosis and Treatment Diagnostic methods:

- clinical examination and probing;
- vital staining;
- radiographic imaging;
- CBCT in complex cases.

Treatment of caries: - early stage – remineralization and infiltration (ICON); - moderate and deep lesions – minimally invasive cavity preparation and adhesive restorations; - behavioral management – child adaptation, use of rubber dam, modern anesthesia techniques. Treatment of periodontitis: - conservative endodontics (cleaning and obturation of root canals); - adjunctive methods (physiotherapy, antimicrobial medication); - surgical interventions in advanced cases.

Pediatric therapeutic dentistry faces not only clinical but also psychological challenges.

Many young patients experience pronounced fear and anxiety, which complicates treatment and may result in refusal of necessary care. One promising approach is the application of play-based methods, including: – presenting instruments in the form of a game; – using toys and cartoons to explain procedures; – “doctor role-play,” allowing the child to treat a toy patient. Such strategies have been shown to reduce anxiety, improve cooperation, and foster a positive experience. Parental involvement is equally important: their calmness and supportive attitude strongly influence the child’s perception of dental treatment. Thus, effective management of pediatric caries encompasses not only clinical intervention but also the creation of a supportive and trust-based environment.

A carious cavity in a child is a sign of tissue breakdown that, if left untreated, inevitably progresses to complications. Periodontitis represents the most serious outcome, often resulting in tooth loss and disturbances in craniofacial development. An effective strategy should include:

1. prevention (oral hygiene, diet, regular check-ups);
2. early detection of incipient lesions;
3. minimally invasive restorative techniques;
4. attention to psychological aspects, including play-based methods. Only a comprehensive approach – clinical and psycho-emotional – can reduce the prevalence of caries and improve the overall treatment experience in pediatric dentistry.

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