

Morphological Features of Bottle (Circular) Caries

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Annotation: Caries in early childhood (CVRV), formerly known as caries from a feeding bottle, caries from a baby bottle, caries from a night bottle and caries from a night bottle for feeding, is a disease affecting teeth in children aged from birth to 71 months. CVR is characterized by the presence of 1 or more affected (without carious cavities or with carious cavities), missing (due to caries) or filled tooth surfaces in any baby tooth. ECC has been shown to be a very common transmissible bacterial infection, usually transmitted from a primary caregiver to a child.

Keywords: circular caries, periodontitis, perforation of the bottom cavity.

Bottle (circular) caries is caries of temporary (milk) teeth, which occurs at the stage of root formation in young children, i.e. at 1.5—3 years old.

The peculiarity of the disease is an acute, rapidly progressive course, a multiplicity of lesions and a symmetrical arrangement of carious defects.

The factors that contribute to the appearance of bottle caries can be divided into local and general.

Local factors:

- Cariesogenic flora is the most common cause of circular caries. It can be transmitted to a child from parents or from other people who care for him. Therefore, it is so important to monitor the dental health of parents, as well as to minimize factors that facilitate the transmission of microorganisms (for example, the use of shared utensils, hygiene products, etc.).
- Poor oral hygiene.
- Enamel hypoplasia is a non—carious lesion of the teeth that occurs in their rudiments (i.e. before eruption) due to a violation of metabolic processes, mineral and protein metabolism in the body of the fetus or child. This disorder leads to a weakening of the enamel, which increases the risk of caries [7].

- Nutrition features. Frequent breast-feeding, as well as a large amount of sugar in baby juices and cereals, can accelerate the process of tooth decay. All this is a medium for the growth of pathogenic bacteria. Night feeding will also have a negative effect on baby teeth. Since the child falls asleep immediately after feeding, the parents do not brush his teeth. At the same time, during sleep, the production of saliva is reduced, which should weaken the effect on the mucous membrane and teeth of aggressive substances, high and low temperatures, food and drinks. As a result, natural hydration, cleansing of the tooth surface and saturation with minerals does not occur.

Common factors:

Immunity. In viral or infectious diseases, the composition of saliva changes. The intake of specific protective factors — immunoglobulins - into saliva decreases, which leads to rapid bacterial growth. Therefore, children with weakened immune systems develop caries more actively and more often than healthy ones.

Lack of vitamins and trace elements. With improper unbalanced nutrition, the body receives insufficient amounts of vitamins and minerals, as a result of which the enamel is poorly mineralized due to saliva. Of particular importance is the timely introduction of complementary foods — cottage cheese, juices, vegetable and fruit purees, since these products are the main source of trace elements necessary for the formation of dental caries resistance.

Chronic diseases — frequent colds, rickets, dyspepsia (digestive disorders), exudative diathesis, gastroenterocolitis, endocrine gland dysfunction, iron deficiency anemia, measles, scarlet fever, diphtheria, dysentery, pneumonia, whooping cough, etc. They affect the mineral metabolism in the child's body, which disrupts the primary mineralization and maturation of hard tooth tissues [9]. Diseases also lead to a general weakening of the body and a decrease in immunity. During the disease, the microflora of the oral cavity becomes activated, which becomes pathogenic, all protective reactions of the body (including saliva) decrease, all chronic diseases of the oral cavity (if any) are activated [1][2].

The course of the mother's pregnancy. Since temporary teeth begin to be laid in the first trimester of pregnancy, it is very important to monitor the health of the mother. Toxicosis during pregnancy is one of the important adverse factors affecting the damage of temporary teeth by caries. Thus, children born to mothers with late toxicosis had a higher prevalence and intensity of caries during three years of dental follow-up compared with children whose gestation was not accompanied by any complications [8].

Maternal diseases — rheumatism, heart defects, hypertension, arterial hypotension, endocrine diseases, diseases of the gastrointestinal tract, kidneys, blood, etc. They adversely affect the formation of all tissues of the child's future tooth, as well as the mineralization of enamel and dentin (hard tooth tissue).

Bad habits of the mother. The intake of alcohol, drugs and medicines negatively affects the child: they affect the rudiments of milk and permanent teeth, contribute to the appearance of malformations of hard tooth tissues, impaired mineralization of the antenatal (intrauterine) enamel of the fetus. All this forms a low resistance of tooth tissues to caries in the unborn child [9][10].

Caries are localized mainly in the cervical region of the upper incisors and in the furrows of the first and second temporary molars. It spreads rapidly along the plane, covering the entire tooth, which as a result easily breaks off. The cavities are usually saucer-shaped. The edges of the enamel are smoothed, the cavity is flat, the underlying dentin is moist, it quickly collapses.

Subjective feelings are diverse and depend on the stage of the disease.

There may be no complaints at the initial stages. Rarely do children complain of short-term pain, a feeling of discomfort (astringent sensation) from chemical irritants (sweet and sour food), which quickly pass after the elimination of the irritating factor.

When caries spreads to the contact surfaces, complaints arise about food getting stuck between the teeth, gum inflammation, and bleeding.

With deeper lesions, the integrity of the enamel and dentin junction is always violated. The degree of softening of dentin depends on the activity of the course of the carious process.

The process of caries spread may be limited to the surface of the tooth on one side, but most often it affects the contact surfaces, which leads to a fracture of the crown part. In this course, caries is often complicated by inflammation of the pulp, the soft connective tissue inside the tooth [1].

Bottle caries quickly changes from an uncomplicated form to a complicated one. This is due to the anatomical features of the structure of dentin and pulp of temporary teeth:

wide dentine tubules;

a thin layer of insufficiently mineralized dentin above the pulp;

significant volume of the tooth cavity;

the proximity of the pulp horns to the enamel-dentine border.

The immature pulp of the child's temporary tooth is still unable to form replacement and sclerosed dentin, which would restrain the progression of caries.

Dentin permeability is provided by dentine tubules, through which pathogens can spread. Some molecules interact with dentin, which leads to their retention inside the dentine tubules. As a result, the amount of pathological substances in the dentin itself decreases. It is believed that the deep layers of dentin are poorly resistant to bacterial, chemical and physical stimuli that lead to a painful reaction.

Sensitive nerve endings react by releasing neuropeptides responsible for the transmission of neurogenic information. These mediators release plasma proteins from blood vessels, which migrate to the dentine tubules and reduce the permeability of dentin.

With deep lesions, a pronounced pulp reaction develops, which leads to a violation of the layer of odontoblasts — cells that form dentin. Damage to these cells causes an inflammatory reaction, mainly aimed at the regeneration of dentin in the area of damage.

Measures to slow down the flow of tissue fluid and diffusion in the dentin area reduce the likelihood of adverse reactions from the pulp [1][4].

Depending on the depth of the lesion, caries is divided into four stages [1][6]:

Initial caries. It is localized in the cervical region on the contact surfaces of incisors and molars, as well as in fissures (natural depressions). It represents chalky spots without natural shine. There are no subjective feelings. At this stage, they rarely go to the dentist, since parents usually do not notice these spots because of the plaque layer. Therefore, the disease progresses to the next stage.

Superficial caries. It is characterized by the formation of a defect in the enamel, not reaching the junction of the enamel with dentin. Localization corresponds to the initial stage. On objective examination, the defects are clearly visible, the destruction of the enamel structure is visible. When probing (examining the tooth with a special tool), a rough softened surface is determined. There may be no complaints. Sometimes there is a feeling of discomfort when eating sour or sweet food.

Medium caries. The most common form of caries of baby teeth. The characteristic localization is the contact surfaces of the chewing teeth. Children complain of food getting stuck between their teeth, toothache when eating sweet food. Sometimes the symptoms may be absent. During the examination, a carious cavity with a narrow inlet is found. The undercut edges of the enamel have a matte white color. Dentin is light yellow or pigmented, softened, easily removed with a tool. If the thin edges of the enamel are broken off, a wide inlet is possible. Probing can be painless or sensitive at the border of enamel and dentin.

Deep caries. There are pains during the intake of sweet food, rarely due to temperature stimuli. The cavity of caries is localized within the dentin near the pulp. The diagnosis at this stage can be made after a thorough diagnosis, based on objective sensations during probing of the cavity (dense or softened dentin), temperature samples, as well as X-ray data. Often this form leads to various complications.

Complications of bottle caries

Due to the rapid progression of bottle caries, the tooth becomes more sensitive and reacts more acutely to stimuli. Ignoring these symptoms, which worsen the child's quality of life, can lead to the development of complications [12]:

pulpitis (inflammation of the pulp — the soft tissue inside the tooth);

periodontitis (inflammation of the periodontium — the soft tissue surrounding the tooth);

early loss of teeth and formation of malocclusion.

Pulpitis is characterized by the manifestation of pain (sometimes regardless of the stimulus), which can radiate to the area of the temple, ear and teeth located next to the affected tooth.

Periodontitis is accompanied by pain in the tooth during chewing or touching, a feeling of "elongation" of the tooth, swelling of soft tissues.

The most formidable complication of bottle caries is the defeat of the rudiments of permanent teeth, as a result of which permanent but unhealthy teeth erupt.

Diagnosis is based on subjective and objective data, carried out using basic and additional research methods.

Visual inspection using a dental mirror and probe. The doctor pays attention to the change in the color of the enamel, the density of tissues, the condition of the contact surfaces (preserved or destroyed).

Methods of treating bottle caries are divided into two groups [1][3][4][5]:

non—invasive (non-surgical) - used for shallow lesions (initial and superficial caries);

invasive — applicable for the treatment of medium and deep caries.

Noninvasive methods

Remineralizing therapy is the restoration of the mineral composition of the hard tissues of the tooth with the help of calcium and fluoride preparations. It can be performed both in the clinic and at home.

Deep fluoridation is performed by treating the tooth surface with a liquid that seals the enamel. In this case, highly dispersed calcium fluoride is formed, thanks to which the particles penetrate deep into the areas of demineralized enamel and contribute to the restoration of its mineral composition.

At home, it is possible to use calcium-containing gels, for example, Tooth Mousse, ROCS medical minerals, etc.

The impregnation method (silvering) is the filling of root canals. For this purpose, an alcoholic solution of silver nitrate is used, which together with organic compounds forms albuminates that form a protective film on the surface of enamel or dentin. The disadvantage of this method is the persistent staining of the tooth surface in black.

Invasive methods

Enamel infiltration with "Icon" material is a modern microinvasive treatment method. It is based on the stabilization of hard tissues by closing enamel pores, which are the "entrance gate" for the penetration of acids and the release of dissolved minerals. The tooth surface is treated with a 15%

hydrochloric acid solution, followed by filling the lesion with a mixture of synthetic resins having certain rheological properties (low viscosity and high penetrating power).

Preparation of caries. The main tool for opening a carious cavity is a drill. With small, shallow lesions, caries can be dissected manually using an excavator. Due to the large number of lesions in combination with local anesthesia, the use of general anesthesia or sedation with nitrous oxide is required.

Various groups of materials are used for sealing: composite seals, glass ionomer cements, and compomers. For temporary teeth, preference is given to glass ionomer cements, taking into account their connective and anti-cariogenic properties.

With extensive destruction of the crown part, the tooth is restored with standard metal crowns made of stainless steel. This protects the tooth from plaque, chemical and thermal effects of food, and also protects the remaining hard tissues of the tooth.

Complications arising during treatment:

- Perforation of the bottom of the cavity. It occurs during rough preparation due to ignorance of the anatomy of temporary teeth. When the bottom is perforated, a drop of blood is released. As a result, the tooth has to be treated as pulpitis.
- Damage to adjacent teeth.
- Damage to the gingival margin. It occurs when caries is localized on the contact surfaces and in the cervical region.
- Incorrect choice of filling material.

Complications that occur after treatment:

Inflammation and necrosis of the pulp. The reasons may be traumatic treatment of the bottom of the tooth cavity, a burn during antiseptic treatment, the use of filling materials without an insulating gasket — cofferdam. At the first signs of inflammation, it is necessary to treat the root canals endodontically.

Secondary caries. It is a consequence of incomplete removal of the affected tissues. Unpleasant sensations appear in the tooth when eating.

Periodontitis. It usually occurs a few days or months after the filling. It is manifested by pain when biting on a tooth. During the examination, you can find a filling that prevents the teeth from closing properly due to overbite.

The seal is falling out. It may be the result of an incorrect choice of filling material, as well as saliva ingress during filling. Therefore, it is necessary to use cofferdam during treatment [1].

With early diagnosis, the prognosis is favorable. In advanced stages, caries can lead to early tooth loss, damage or death of the rudiment of a permanent tooth.

If the disease develops, treatment and subsequent monitoring are necessary. Due to the rapid progression of the disease, preventive examinations should be carried out every 2-3 months.

Prevention of bottle caries involves the identification of risk factors:

problems during pregnancy of the mother;

the pathological course of childbirth;

the unsatisfactory condition of the child after birth;

the nature and mode of feeding (the presence of night feedings, bottle feeding through a pacifier, diseases of the 1st year of life and taking medications).

The first appointment with a dentist should take place in the first month of the child's life. At this age of the patient, the doctor will be able to identify risk factors for the development of caries and give recommendations on oral hygiene.

Erupted teeth need to be cleaned. For this purpose, special napkins or a soft cloth moistened with boiled water are used. There are also rubber finger brushes with polymer bristles.

Literature

1. Dzhuraevna, K. M. (2023). THE FREQUENCY OF DENTAL DISEASES IN CHILDREN (LITERATURE REVIEW). *Лучшие интеллектуальные исследования*, 12(1), 159-168.
2. Dzhuraevna, K. M. (2023). FEATURES OF THE OCCURRENCE OF DENTAL DISEASES IN CHILDREN. *Лучшие интеллектуальные исследования*, 12(1), 178-185.
3. Dzhuraevna, K. M. (2024). Prevalence and Course of Dental Diseases Among Younger Patients. *Research Journal of Trauma and Disability Studies*, 3(5), 433-436.
4. Dzhuraevna, K. M. (2024). Features of Caries Morbidity in Preschool Children. *Research Journal of Trauma and Disability Studies*, 3(3), 300-305.
5. Dzhuraevna, K. M. (2024). Clinical and Morphological Aspects of Cracks on The Back Teeth in Adults. *Research Journal of Trauma and Disability Studies*, 3(5), 429-432.
6. Хайитова, М. Д. (2023). РАСПРОСТРАНЕННОСТЬ И РАСПРЕДЕЛЕНИЕ ТРЕЩИН НА ЗАДНИХ ЗУБАХ СРЕДИ ВЗРОСЛЫХ ПАЦИЕНТОВ (ОБЗОР ЛИТЕРАТУРЫ). *Лучшие интеллектуальные исследования*, 12(1), 186-195.
7. Хайитова, М. Д. (2023). Особенности Возникновение И Течение Кариеса Зубов. *Research Journal of Trauma and Disability Studies*, 2(12), 356-363.
8. Хайитова, М. Д. (2023). КЛИНОКО-МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ВОЗНИКНОВЕНИЯ СТОМАТОЛОГИЧЕСКИХ ЗАБОЛЕВАНИЙ У ДЕТЕЙ. *Лучшие интеллектуальные исследования*, 12(1), 169-177.
9. Хайитова, М., & Тайлақова, Д. (2023). ВЗГЛЯД СТОМОТОЛОГА НА ГИГЕНУ ПОЛОСТИ РТА У ДЕТЕЙ. *Инновационные исследования в современном мире: теория и практика*, 2(23), 58-59.
10. Abdusalimovna, K. M. (2024). Current Representations of Simple Prosthodontics. *Best Journal of Innovation in Science, Research and Development*, 3(3), 228-234.
11. Abdusalimovna, K. M. (2024). THE USE OF CERAMIC MATERIALS IN ORTHOPEDIC DENTISTRY.(Literature review). *TADQIQOTLAR*, 31(3), 75-85.
12. Abdusalimovna, K. M. (2024). THE ADVANTAGE OF USING ALL-CERAMIC STRUCTURES. *TA'LIM VA INNOVATION TADQIQOTLAR*, 13, 49-53.
13. Abdusalimovna, K. M. (2024). CLINICAL AND MORPHOLOGICAL FEATURES OF THE USE OF METAL-FREE CERAMIC STRUCTURES. *TA'LIM VA INNOVATION TADQIQOTLAR*, 13, 45-48.
14. Кузиева, М. А. (2023). Клиноморфологические Критерии Органов Ротовой Полости При Применении Несъемных Ортопедических Конструкций. *Research Journal of Trauma and Disability Studies*, 2(12), 318-324.
15. Abdusalimovna, K. M. (2024). MORPHO-FUNCTIONAL FEATURES OF THE METHOD OF PREPARATION OF DEPULPATED TEETH FOR PROSTHETICS. *SCIENTIFIC JOURNAL OF APPLIED AND MEDICAL SCIENCES*, 3(4), 301-307.

16. Abdusalimovna, K. M. (2024). Clinical and Morphological Features of the Use of Non-Removable Orthopedic Structures. *JOURNAL OF HEALTHCARE AND LIFE-SCIENCE RESEARCH*, 3(5), 73-78.
17. Kurbanova, N. V. (2024, July). Modern Views on the use of Metal-Ceramic Structures in Dental Prosthetics. In *Interdisciplinary Conference of Young Scholars in Social Sciences (USA)* (Vol. 8, pp. 15-18). <https://www.openconference.us/index.ph>.
18. Kurbanova, N. V. (2024). Modern Presentation of Calcium-Containing Drugs in the Course of the Study of Dental Diseases. *International Journal of Alternative and Contemporary Therapy*, 2(7), 12-14.
19. Kurbanova, N. V. (2024). Clinical and Morphological Features the Occurrence of Tooth Decay. *International Journal of Alternative and Contemporary Therapy*, 2(9), 128-132.
20. Saloxiddinovna, X. Y. (2024). MORPHOFUNCTIONAL FEATURES OF THE STRUCTURE AND DEVELOPMENT OF THE OVARIES. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, 4(4), 220-227.
21. Saloxiddinovna, X. Y. (2024). Modern Views on the Effects of the Use of Cholecalciferol on the General Condition of the Bod. *JOURNAL OF HEALTHCARE AND LIFE-SCIENCE RESEARCH*, 3(5), 79-85.
22. Халимова, Ю. С., & Хафизова, М. Н. (2024). МОРФО-ФУНКЦИОНАЛЬНЫЕ И КЛИНИЧЕСКИЕ АСПЕКТЫ СТРОЕНИЯ И РАЗВИТИЯ ЯИЧНИКОВ (ОБЗОР ЛИТЕРАТУРЫ). *TADQIQOTLAR. UZ*, 40(5), 188-198.
23. Халимова, Ю. С. (2024). Морфологические Особенности Поражения Печени У Пациентов С Синдромом Мэллори-Вейса. *Journal of Science in Medicine and Life*, 2(6), 166-172.
24. Xalimova, Y. S. (2024). Morphology of the Testes in the Detection of Infertility. *Journal of Science in Medicine and Life*, 2(6), 83-88.
25. KHALIMOVA, Y. S. (2024). MORPHOFUNCTIONAL CHARACTERISTICS OF TESTICULAR AND OVARIAN TISSUES OF ANIMALS IN THE AGE ASPECT. *Valeology: International Journal of Medical Anthropology and Bioethics*, 2(9), 100-105.
26. Salokhiddinovna, K. Y. (2024). IMMUNOLOGICAL CRITERIA OF REPRODUCTION AND VIABILITY OF FEMALE RAT OFFSPRING UNDER THE INFLUENCE OF ETHANOL. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, 4(10), 200-205.
27. Salokhiddinovna, X. Y. (2023). Anemia of Chronic Diseases. *Research Journal of Trauma and Disability Studies*, 2(12), 364-372.
28. Salokhiddinovna, X. Y. (2023). MALLORY WEISS SYNDROME IN DIFFUSE LIVER LESIONS. *Journal of Science in Medicine and Life*, 1(4), 11-15.
29. Salohiddinovna, X. Y. (2023). SURUNKALI KASALLIKLARDA UCHRAYDIGAN ANEMIYALAR MORFO-FUNKSIONAL XUSUSIYATLARI. *Ta'lim innovatsiyasi va integratsiyasi*, 10(3), 180-188.
30. Халимова, Ю. С. (2024). КЛИНИКО-МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ВИТАМИНА D В ФОРМИРОВАНИЕ ПРОТИВОИНФЕКЦИОННОГО ИММУНИТА. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, 36(3), 86-94.

31. Saloxiddinova, X. Y. (2024). CLINICAL FEATURES OF VITAMIN D EFFECTS ON BONE METABOLISM. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, 36(5), 90-99.
32. Narzulaeva Umida Rakhmatulloevna and Rakhmatova Fotima Ulugbekovna, "PATHOGENETIC MECHANISMS OF DISORDERS IN THE HEMOSTASIS SYSTEM OBSERVED IN PATIENTS INFECTED WITH COVID-19", *IEJRD - International Multidisciplinary Journal*, vol. 7, no. ICMEI, p. 3, Feb. 2023.
33. Narzulaeva, U. (2023). PATHOGENETIC SIGNIFICANCE OF HYPERLIPIDEMIA IN THE CLINICAL COURSE OF ARTERIAL HYPERTENSION. *International Bulletin of Medical Sciences and Clinical Research*, 3(11), 86-91.
34. Narzulaeva, U. (2023). PATHOGENETIC SIGNIFICANCE OF HYPERLIPIDEMIA IN THE CLINICAL COURSE OF ARTERIAL HYPERTENSION. *International Bulletin of Medical Sciences and Clinical Research*, 3(11), 86-91.
35. Нарзуллаева, У., Самиева, Г., & Пардаева, З. (2022). ПАТОФИЗИОЛОГИЯ РЕПЕРФУЗИОННОГО ПОВРЕЖДЕНИЯ МИОКАРДА. *Журнал вестник врача*, 1(2), 155–158. <https://doi.org/10.38095/2181-466X-2020942-154-157>
36. Самиева, Г., Нарзуллаева, У., & Самиев, У. (2023). Течение артериальной гипертензии у жителей засушливого региона. *Каталог монографий*, 1(1), 1–108. извлечено от <https://inlibrary.uz/index.php/monographs/article/view/27456>
37. Oripova, O. O., Samieva, G. U., Xamidova, F. M., & Narzulaeva, U. R. (2020). Sostoyanie plotnosti raspredeleniya limfoidnyx kletok slisistoy obolochki gortani va proyavleniya mestno immuna pri xroncheskom laringite (tahlil seksionnogo material). *Akademiya*, 4 (55), 83-86.
38. Rakhmatulloevna, N. U., & Abdurasulovna, B. M. (2022). GEMOREOLOGIK BUZILISHLAR VA ERITROTSITLAR AGREGATSION XOSSALARI O'ZGARISHINING PATOGENETIK MEXANIZMLARI. *JOURNAL OF BIOMEDICINE AND PRACTICE*, 7(6).