



THE EMERGENCE AND DEVELOPMENT OF DENTAL CARIES

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Annotation. Caries is one of the most common diseases throughout the world. Without exaggeration, this pathology can be called “dental enemy of humanity number 1.” This disease affects 93% of the world's population. It was found even in people who lived 5-6 thousand years ago, and today caries in adults is the cause of tooth loss in almost 90% of cases. Moreover, it leads not only to the formation of the well-known “holes”. Subsequently, when the pathological process begins to spread to the surrounding areas, this causes the appearance of periodontitis, and then complete destruction of the tooth, which requires the irreversible removal of its remains and root.

Key words: caries, teeth, dentist, enamel, dentin, pulp, oral cavity, plaque, teeth cleaning, mouthwash.

Introduction. Caries (from the Latin caries - “rotting”) is a pathological process associated with the activity of bacteria. Caries destroys the enamel of the tooth, and with further development, its internal structures.

Human teeth are made of hard substances. Conventionally, each tooth can be divided into three parts: the crown, the neck (it is located on the border of the crown and the gums), and the root (it is located under the gum). The tooth receives nutrients through the root.

The outside of the teeth is covered with enamel - this is the outer shell that is needed to protect the inner layers of the tooth. Enamel is considered the strongest tissue in the human body, but it is very easily destroyed by various acids. The thickest layer of enamel is on top of the tooth and on the cusps. Closer to the gum, the enamel becomes thinner, and underneath it ends.

Beneath the enamel is dentin, the main hard tissue that makes up the entire tooth. It is less durable than enamel, and therefore is not resistant to the chemical effects of saliva, food and waste products of bacteria that inhabit the oral cavity.

The root and neck of the tooth also consist of dentin, but they are no longer protected by enamel, but by cement. This is bone tissue that is needed for strong attachment of the tooth to the bones of the upper (alveolar process) and lower (alveolar part) jaw.

Pulp is the soft connective tissue inside the tooth that is responsible for the nutrition and sensitivity of the tooth. It is located under the crown. Nerve endings, blood and lymphatic vessels go into the pulp from the root of the tooth through the root canals. Thanks to the pulp, the infection usually does not spread beyond the tooth.

Caries destroys the enamel, and without treatment it begins to progress and passes through the dentin layer. When it gets to the pulp, inflammation develops, which is accompanied by severe pain - pulpitis. Pulpitis develops if caries reaches the bundle of blood vessels and nerve endings of the pulp.

Types and stages of development of caries.

Caries is distinguished by the area of tooth damage, complications, and stages of development. Primary and recurrent caries are also distinguished - those that appeared after tooth treatment.

By stages:

- white matte spot – the initial stage of caries, during which the enamel dissolves and dentin is exposed;
- superficial caries, dentin damage, the stain becomes dark brown, tooth sensitivity appears, it can react to cold, hot, sweet;
- deep caries – the process of decay goes deep into the dentin and can reach almost to the pulp;
- damage to the cement – decay reaches the base of the tooth crown.

For complications:

- simple caries;
- complicated caries – with inflammation of the pulp. Usually accompanied by high tooth sensitivity and severe pain.

Causes of caries.

The main cause of caries is the effect on the enamel of acids that are produced by bacteria inhabiting the oral cavity. The most common of them are *Streptococcus mutans*, *Streptococcus sobrinus* and *Lactobacilli*.

Microorganisms feed on the soft plaque that remains on the teeth after eating. It consists of bacteria, cells of the oral mucosa and food debris (usually carbohydrates). Initially, plaque appears as a rough film; it can be felt on the teeth after eating or if you do not brush them for 24 hours.

At first, saliva copes with the increase in acidity in the mouth, but the longer the bacteria live and the thicker the plaque becomes, the more acid attacks the enamel and eats it away.

After 2-3 days, the plaque begins to harden and mineralizes, becoming saturated with calcium and phosphorus. As a result, tartar forms (usually near the gums or between teeth). With each meal, plaque becomes more and more active, bacteria multiply more actively and produce acid.

Primary caries appears as a white, rough spot on the surface of the tooth. If nothing is done, the spot turns brown and then almost black. Rotting begins: enamel and dentin disintegrate. When caries reaches the dentin, the tooth becomes sensitive.

An additional risk of caries is created by uneven teeth (a lot of plaque remains in the cracks between the teeth), as well as various mechanical damage to the enamel: chips, cracks, gaps between fillings and healthy tooth tissue.

In elderly patients, caries can develop due to taking medications that change the composition of saliva, as well as due to age-related changes in the body and wear of the enamel.

Factors predisposing to the development of caries:

- incorrect or insufficient oral hygiene;
- enamel defects or cracks, chips on the tooth surface;
- dietary features: frequent consumption of carbohydrates (including sweets) and acidic foods;
- a decrease in the amount of saliva or a change in its composition, for example, due to diseases that cause gland dysfunction or certain medications;
- hereditary predisposition to the development of caries.

Caries in children.

Children who have not yet lost their baby teeth may also suffer from tooth decay. The reasons for its appearance are the same: insufficient oral hygiene, consumption of large amounts of carbohydrates. An additional risk of caries is created by a hereditary predisposition to this disease.

Signs and symptoms of caries.

A chalky stain on the surface of a tooth looks like a white area, sometimes rough to the touch. The defect does not interfere with the person, does not cause pain or increased sensitivity of the tooth.

When caries progresses into the dentin, the tooth may begin to react to cold, hot and sweet foods. When eating acidic foods, it can also "shoot", but usually the pain goes away after rinsing the mouth with water. Often people with such caries try not to chew on the affected side.

If caries is not cured, the affected area will grow and deepen. When decay reaches the layers closest to the pulp, the tooth will begin to hurt very much. Swelling and fever may occur if bacteria enter the pulp and an infectious process begins.

In addition, carious damage to the crown of the tooth makes it quite fragile. When eating hard foods, there is a risk of chipping a tooth.

Complications of caries.

Complications usually develop if a person does not begin to treat the pathology on time. When caries reaches the pulp, inflammation develops - pulpitis. This significantly complicates treatment and increases its cost, and also leads to severe pain.

In severe cases, for example, if the infection goes further (into the root, alveolar process or alveolar part, into the gum), inflammation of the tissues adjacent to the tooth (periodontitis) or a cyst may develop. This is a pathology in which a large accumulation of pus appears in the tissues. Hilar cysts also often appear. Very advanced cases can result in inflammation of the jaw bones, osteomyelitis.

Complications are quite common: the need for tooth extraction occurs in about a quarter of adult patients over 35 years of age. These are cases in which, at the time of contacting a doctor, it is too late to treat caries: too little healthy tissue remains in the tooth.

If a lot of teeth are affected and chewing is difficult, a person may experience problems with the gastrointestinal tract. The fact is that caries is a source of bacterial infection. In some cases, it can spread to the gastrointestinal tract.

Prevention and prognosis for caries.

To avoid the development of caries, it is important to regularly and very thoroughly brush your teeth at least once every 24 hours, but preferably twice: in the morning and in the evening. Moreover, you need to use not only a toothbrush, but also additional means: irrigators, dental brushes, floss. They help remove plaque from the crevices between teeth. Separately, some dentists recommend superflosses; these are thicker dental flosses that better clean the interdental space and do not injure the gums when used correctly.

Proper and thorough brushing of your teeth will help prevent tooth decay or slow down its development. You can also use special rinses that protect teeth from tartar formation, kill bacteria and prevent bad breath.

Conclusion. If a person is unable to brush his or her teeth well, or after brushing, discomfort appears in the mouth and the gums bleed, you can contact a dentist: he will conduct an

examination,, if necessary, prescribe treatment, tell you about the correct hygiene technique and recommend a medicated toothpaste with a good composition.

To prevent the occurrence of caries, it is important to teach oral hygiene to the child. This habit will help you avoid tooth decay and the costs associated with dental treatment in the future. It is especially important to do this if there is a genetic predisposition, if the parents had frequent episodes of caries and its relapses.

The prognosis for dental caries depends on the area and depth of tissue damage, as well as on the chosen treatment method. Early contact with the dentist can greatly simplify treatment and increase the chance of saving the tooth.

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