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Origin, Diagnostics and Modern Treatment Methods of Caries

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Annotation: To prevent the development of caries, it is important to brush your teeth regularly and very thoroughly - at least once every 24 hours, but preferably twice: in the morning and in the evening. In addition, you should use not only a toothbrush, but also additional tools: irrigators, toothbrushes, floss. They help clean plaque between the teeth. Some dentists also recommend superfloss, which better cleans the interdental spaces and, when used correctly, does not injure the gums. Caries is the decay of tooth tissue due to bacteria living in the oral cavity. Pathology occurs due to improper or insufficient oral hygiene. If caries is not treated, it causes severe pain and can completely destroy the tooth.

Keywords: Causes of caries; Signs and symptoms of dental caries; Complications of caries; Diagnosis of caries; Treatment of caries; Prevention and prognosis of caries.

Introduction: Caries (from Latin caries - "rotten") is a pathological process associated with the activity of bacteria. Caries destroys tooth enamel and, if it progresses further, its internal structures.

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

Externally, teeth are covered with enamel - this is the outer shell that protects the inner layers of the tooth. Enamel is the strongest tissue in the human body, but it is very easily destroyed by

various acids. The thickest layer of enamel is located on the top of the tooth and on the tubercles. Closer to the gum, the enamel becomes thinner and ends under it.

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

The root and neck of the tooth are also made of dentin, but they are protected not by enamel, but by cementum. This is the bone tissue necessary for the 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 lymph vessels pass from the root of the tooth to the pulp through the root canals. Because of the pulp, infection usually does not spread outside the tooth.

Caries destroys the enamel and, if left untreated, begins to progress and penetrate the dentin layer. When it reaches the pulp, inflammation develops, which is accompanied by severe pain - pulpitis.

Caries is one of the most common diseases in the world. In Russia, it occurs in 99% of people over 35 years old, but is most often diagnosed in children and adolescents.

Caries is characterized by the area of damage to the teeth, complications and stages of development. There is also a difference between primary and recurrent caries, which occur after dental treatment.

By stages:

a. white matte spot - the initial stage of caries, in which the enamel dissolves and the dentin is exposed;

b. superficial caries, dentin damage - the spot becomes dark brown, the tooth becomes sensitive, it can be affected by cold, hot, sweet;

c. deep caries - the decay process penetrates deep into the dentin and can reach almost the pulp;

d. Cementum damage - decay reaches the base of the tooth crown.

The main cause of tooth decay is the action of acids produced by bacteria living in the oral cavity on the enamel. The most common of these 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 - you can feel it on your teeth after eating or if you do not brush them for 24 hours.

Initially, saliva fights the increased acidity in the mouth, but the longer the bacteria live and the thicker the plaque, the more the acid attacks the enamel, causing it to corrode.

After 2-3 days, the plaque begins to harden - it is mineralized, saturated with calcium and phosphorus. As a result, tartar is formed (usually near the gums or between the teeth). With each meal, plaque increases, bacteria multiply more actively and produce acid.

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

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

In elderly patients, caries may develop due to taking medications that change the composition of

saliva, as well as age-related changes in the body and wear of enamel.

Research methods and materials: Children who have not yet lost their baby teeth can also suffer from dental caries. The causes of its occurrence are the same: poor oral hygiene, excessive consumption of carbohydrates. An additional risk of caries is created by a hereditary predisposition to this disease. A chalky spot on the surface of the tooth appears white, sometimes rough to the touch. The defect does not bother a person, does not cause pain or increased tooth sensitivity.

When the solution penetrates the dentin, the tooth may react to cold, hot, and sweet foods. It may also "shoot" when eating acidic foods, but the pain usually goes away after rinsing the mouth with water. Often, people with this type of caries try not to chew on the affected side.

If caries is not treated, the affected area will grow and deepen. When the decay reaches the layers closest to the pulp, the tooth will begin to hurt very badly. If bacteria enter the pulp and infection begins, swelling and fever may occur.

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

If a person does not start treating the pathology in time, complications usually develop. When caries reaches the pulp, inflammation develops - pulpitis. This significantly complicates the treatment and increases its cost, and also leads to severe pain.

In severe cases, for example, if the infection spreads further (to the root, alveolar process or alveolar part, gums), inflammation of the tissues adjacent to the tooth (periodontitis) or the development of a cyst may occur. This is a pathology in which a large accumulation of pus occurs in the tissues. Root cysts also often appear. In very advanced cases, this can lead to inflammation of the jaw bones - osteomyelitis.

Complications are very common: the need for tooth extraction occurs in a quarter of adult patients over 35 years of age. These are cases when by the time you see a doctor it is too late to treat caries: there is very little healthy tissue left in the tooth.

If many teeth are affected and chewing becomes 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.

A dental therapist diagnoses caries. As a rule, the pathology is detected when a patient comes to the dentist with complaints of pain or increased tooth sensitivity to sweet, sour, salty, hot or cold foods.

During the examination, the doctor can visually detect caries - it looks like a dark spot on the enamel. The specialist checks the sensitivity and condition of the tooth surface using a special probe, which resembles a thin metal hook. If you feel discomfort or pain when touching the tooth with the probe, this is one of the signs of pathology.

To assess the depth of the lesion, the doctor will order an X-ray of the diseased tooth. The images are also useful in cases where the caries is hidden under a filling or between teeth and is not visible to the naked eye.

New technologies, such as laser fluorescence-detecting diagnostic tools, also make it possible to "highlight" carious areas and identify foci of bacterial infection.

Based on the results of the examination, hardware studies, and complaints, the doctor can decide on further treatment.

Results: At the chalky point stage, the development of caries can be slowed down. To do this, the doctor treats the teeth with a special composition containing fluoride (remineralization), and also recommends regular brushing of the teeth with special toothpastes and monitoring the level of calcium in the body. In this case, the tooth can be preserved for decades.

Black caries that have fallen into the dentin must be removed by a doctor. To do this, the damaged part of the tooth is cut out - a drill and ground using a special dental drill that rotates in it. If the tooth is sensitive, the doctor first uses an anesthetic injection to relieve pain. The doctor decides on the need for anesthesia, based on the patient's feelings, but modern specialists prefer to do it "by default".

Before giving a painkiller injection, the doctor will ask about chronic diseases and drug allergies. Some patients are contraindicated for anesthesia.

If the caries has penetrated closer to the pulp and caused its inflammation (pulpitis), the pain will be very severe. The doctor performs the depulpation procedure - remove blood vessels and nerve endings from the tooth canals, and then seal them hermetically. This procedure allows you to save a severely damaged tooth, but without the pulp it is considered “dead”: it does not receive nutrients and completely loses sensitivity. If a new caries lesion appears under the filling in such a tooth, the patient will not feel pain and will not notice it.

If a large part of the depulped tooth is damaged, the doctor may suggest prosthetics using an artificial crown. The fact is that a large filling will not be able to adequately distribute the load on the tooth, and the material itself can shrink and expand greatly due to temperature changes. This can lead to decay of the tooth root, which will then have to be removed and replaced with an implant. Most often, this nuance concerns the lateral teeth that a person chews on - molars and premolars.

The crown is installed in several stages. First, the doctor destroys the canals - removes the nerve endings from them. Then the canals are filled and the tooth is prepared for installing the crown - it is attached using a special cement.

The situation with front teeth - incisors is approximately the same: if the area of damage to the tooth is not too large, a filling can be placed. An alternative to large fillings on front teeth are veneers. This is a partial ceramic crown - a coating that covers the tooth from the front down. Fillings and veneers restore the aesthetic appearance of the smile and, if cared for carefully, last a long time.

Discussions: It is difficult to restore a severely damaged tooth with a veneer or filling, in which case the doctor will also recommend a crown; A properly placed crown can last more than 10 years. In addition, it does not impose any restrictions: you can chew hard food and even nuts. However, for patients with crowns, it is very important to undergo professional cleaning every six months to maintain oral hygiene and prevent the development of caries underneath. Then there is only one option left - implantation.

A dental implant is a large screw that is screwed into the bone. After a metal (often titanium or zirconium) post has taken root, a crown is attached to the implant.

The main disadvantages of implants are their high cost and lengthy installation in several stages. In addition, this process is painful and has contraindications.

An artificial tooth made of high-quality materials can last for several decades, but only if you strictly follow the doctor's recommendations and regularly examine your oral cavity.

Pregnant women often try to avoid dental treatment: it is widely believed that the X-rays and anesthetic drugs used during a jaw scan can harm the unborn child. However, according to the American Dental Association, local anesthesia and treatment are generally safe for the fetus and do not affect it in any way.

According to a study conducted in Finland, even X-rays cannot harm an unborn child: during a regular flight, a woman receives a much higher dose of radiation than during such a study.

However, the decision on the possibility of dental treatment should be made, first of all, by the obstetrician-gynecologist who is monitoring the pregnancy. If the benefits of dental treatment

outweigh the possible harm, the doctor will give recommendations and tell you which procedures are acceptable and which should be postponed until after the baby is born.

For example, tooth extraction or implantation requires additional medications - antibiotics, which in one way or another affect the fetus. Placing a small filling is unlikely to affect the mother and child, but it will significantly alleviate the patient's condition and relieve him of pain.

Conclusion: Brushing your teeth properly and thoroughly can help prevent cavities or slow their development.

You can also use special mouthwashes - they protect teeth from tartar formation, kill bacteria, and prevent bad breath.

If a person cannot brush their teeth properly or experiences discomfort in the mouth after brushing and their gums bleed, they can consult a dentist: he or she will conduct an examination, prescribe treatment if necessary, talk about proper hygiene techniques, and recommend a medicated toothpaste with good ingredients.

It is important to teach your child good oral hygiene to prevent cavities. This habit will help prevent future tooth decay and dental treatment costs. This is especially important if there is a genetic predisposition, or if the parents have frequent episodes of cavities and their recurrence.

The prognosis of dental caries depends on the area and depth of tissue damage, as well as the chosen treatment method. Early treatment by a dentist significantly simplifies treatment and increases the chances of saving the tooth.

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