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Cavities Causes, diagnostics and Methods of Treatment and Prevention of Moderate Cavities

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Abstract--*Cavities is the most common dental pathology, accompanied by necrosis of their tissues. Most researchers claim that an adult person at least once in a life goes to a dentist about cavities. However, most often the pathology occurs in people and elderly people. Most often, the enamel is affected, but the carious lesion can spread deeper up to the dentin or pulp. Among the clinical and morphological forms of cavities, the most common are moderate and deep cavities. The moderate one is a borderline state between superficial and deep cavities.*

Although moderate cavity affects children and adolescents more often than adults, this defect is often observed on baby teeth. According to the clinical course, cavity is divided into acute and chronic; by localization it is divided into cervical, fissure and proximal.The article tells about the causes of such a defect, methods of diagnosis and treatment.

The work is based on data collected in Novosibirsk during the examination and after the patient's treatment by a dentist. The patient was diagnosed with cavity of the 2nd molar of the lower jaw and developed a treatment scheme for this pathology.

Key words--*dentistry, cavity, moderate cavity, cavity treatment, cavity treatment scheme, filling.*

I. INTRODUCTION

Reasons

Perhaps, cavity is more common than any other dental pathology. The distribution statistics for this defect is shown in figure 1.

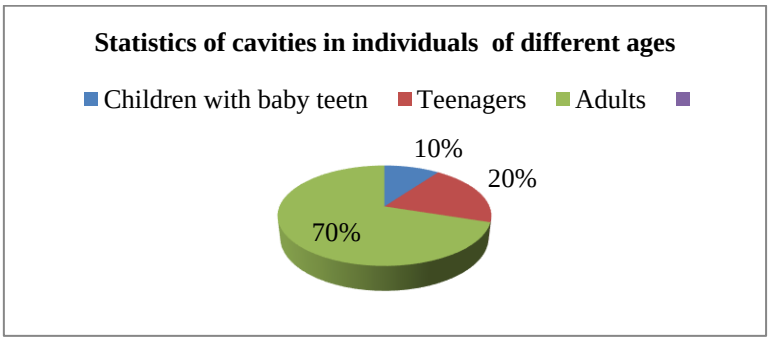

Figure 1. Statistics on the prevalence of cavities in individuals of different age groups

The Central development of the carious process includes three main factors:

– high-carb diet;

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– presence of cariesogenic microflora in the oral cavity;
– low/the reduced resistance of dental tissues to action of adverse factors.

Agadjanyan E. G. relies on modern facts that the enzymatic fermentation of carbohydrates occurs due to microorganisms – organic acids are formed, leading to the demineralization of tooth enamel and the penetration of microbes into deep-lying dental tissues. [1]

Cariesogenic situation is a condition that causes caries to progress and develop much faster. These conditions include:

- dental abnormalities (malocclusion, dental crowding, etc.);
– poor / unsatisfactory oral hygiene (presence of plaque or tartar);
– frequent bleeding of the gums;
- dental diseases that occur as a result of calcium, phosphorus or fluorine deficiency);
- defective diet, etc.

Only in the case of progress of cavities of a superficial degree will the average degree develop. This stage is accompanied by the destruction of dentin and enamel – then the process goes directly to the dentin. A large number of microbes penetrate the enlarged dentine tubules – toxins are formed, necrotizing or leading to dystrophy of the processes of odontoblasts. The products of microbial metabolism penetrate deep into the tubules – dentin is demineralized and softened. [2, 5, 9]

Caries cavity is the central sign of medium caries. It has the shape of a cone, the tip of which is turned deep into the tooth, the base is turned to the surface. The cavity is formed in three stages:

– softening of dentin, the structure of which is broken;
– calcification of dentin;
- replacement of dentin, which stabilizes the carvity process.

Kalamkarov H. A. identifies the types of sugars that are more important in the development of caries and those that do not participate in the development of the process [7]:

- mannitol, xylitol, sorbitol-are transformed into fructose under the action of low-activity enzymes – in this case, sugars do not participate in the development of the carious cavity.
- sucrose during fermentation forms a large number of acids that strongly change the pH of the oral cavity, hence the provocation of the development of the carious process.
- starch-polymer of large sizes, therefore, does not penetrate the plaque and does not contribute to the development of caries.
- glucose, fructose-like sucrose are a great danger to dental health.

The human oral cavity has its own specific microflora. Carious activity is inherent in only two types of microbes:

- lactobacilli-form lactic acid by converting lactose and other sugars into it.
- acid-forming streptococci-form anaerobic fermentation.

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These microbes in the course of metabolism form acidic products that destroy dental tissue. Carbohydrates become the basis for reproduction in this process. [1, 10]

Factors of cariogenic:

1. The nature of the food. In particular, the food is soft and carbonaceous.
2. Anatomy of the teeth. This could include a wide interdental crevices where food debris can easily get in the course of fermentation, which form a fertile environment for development of pathogenic microflora.
3. The volume of saliva. In large quantities, saliva removes microbes from the oral cavity, but if it is insufficient or increases the viscosity of the microorganisms are easily attached to the outer layer of enamel.
4. The oral hygiene. With its lack or absence, plaque accumulates, further leading to the appearance of Tartar and, accordingly, the development of pathogenic microflora.
5. The amount of fluoride. It depends on its content in the food. It is formed due to Apatite minerals that increase the resistance of dental tissue to the action of an acidic environment.
6. Fullness and regularity of food intake. The risk increases with large intake of carbohydrate foods, and low vitamin content weakens the tooth enamel.[3, 4, 6]

Symptoms

The symptoms of moderate cavities do not differ much from those of other degrees, but they have their own characteristics. It is characterized by an increase in the reaction of the tooth to chemical and temperature stimuli, moderate or mild pain. If you eliminate the cause of these symptoms, the pain will soon pass. Complaints may be absent if the dentin is replaced, in this case the effect of the stimulus on the pulp will be noticeably less. [7, 8]

In the area of the affected tooth, a dark spot or cavity (hollow) may appear, accumulating food remnants. This factor can also cause an unpleasant smell of the oral cavity. [1]

Figure 2. Types of cavities

Stain stage Surface cavity Medium cavity Advanced cavity

Medium cavity, having a chronic course, may not show signs for a long time and imperceptibly go into a deep stage, complicating the course of pulpitis. The average degree is more often observed on chewing teeth.

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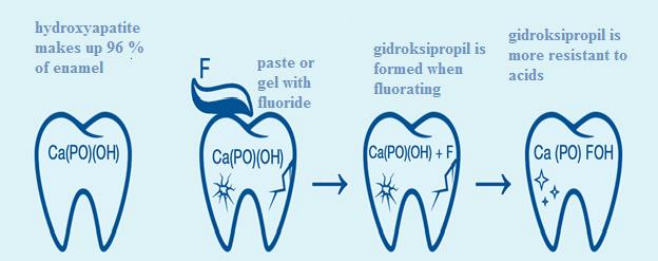

Figure 3. Causes of tooth enamel weakening

Diagnostics

Examination in dentistry allows you to identify a shallow carious cavity with softened pigmented dentin – while it does not touch the dental cavity. Painless is sensing when the decay of the average degree on the boundary of the dentine–enamel.[1, 5]

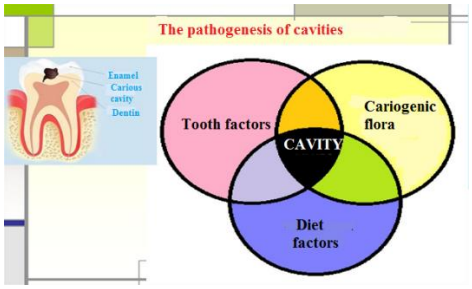

Figure 4. The pathogenesis of dental cavities

A thermal test for average cavity gives a positive result. Electrodontodiagnostics reveals the reaction of the pulp to the current strength of 2-6 MK. During radiography of the tooth (radiovisiographic examination), changes in the periodontal tissues are not detected. Differential diagnosis should be made between average cavity and tooth erosion, wedge-shaped defect, deep cavity, and chronic periodontitis.

Treatment

Complex treatment of medium cavity include a number of strictly sequential stages of preparation and filling of the tooth. Usually, the entire range of therapeutic activities is performed by a dentist-therapist in one visit.

Treatment of middle cavity is performed under local infiltration or conductor anesthesia. With the help of spherical bores, the carious cavity is opened and expanded, and the overhanging edges of enamel and softened dentin are removed. At the stage of formation of the tooth cavity, optimal conditions are created for fixing the filling. After finishing the cavity, it is medicated with antiseptics and thoroughly dried. An insulating pad is placed on the bottom and walls of the cavity, over which a permanent seal is applied, usually made of a composite of chemical curing or light polymerization materials. The final stage is the grinding and polishing of the seal. [4, 10]

Predict And Prevention

If all the principles are observed, the treatment of medium cavity is usually successful: pain disappears, and the aesthetic and functional integrity of the tooth is restored. In the absence of treatment at this stage, medium cavity can rapidly progress to deep, leading to the development of complications – pulpitis and periodontitis. [4]

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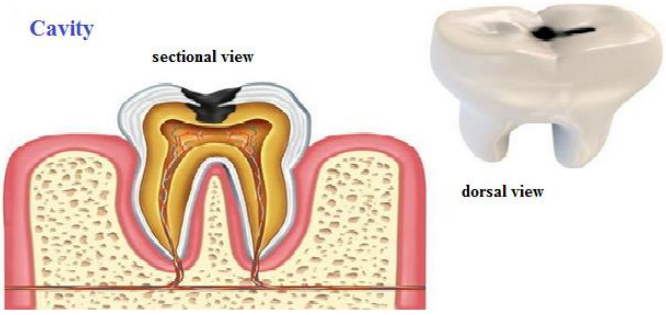
The key to preventing secondary cavity is systematic visits to the dentist, carrying out preventive measures (remineralizing therapy, occupational hygiene), timely elimination of the initial forms of cavity, nutrition correction. It should be remembered that regular and proper oral hygiene reduces the need for dental treatment by 75-80%.

When the seal finally hardens, the oral cavity must be provided with good regular hygiene. Let's look at how to properly care for sealed teeth, so that the seal will serve you as long as possible:

1. For daily cleaning you should use not only the paste with a brush, but also floss. In particular, its use is important after a meal. Food residues are harmful not only to fillings, but also to non-filled teeth.
2. Excessive consumption of beverages such as tea and coffee, as well as wine can cause the already frozen seal to turn black. Therefore, after drinking these drinks, you should immediately brush your teeth, so as not to let them soak into the tooth enamel. Tobacco also causes darkening.
3. Limit the use of sweet foods. It is sweets that most often cause caries. They can also cause cavity around the filling, which will cause it to fall out prematurely. After eating something sweet, be sure to rinse your mouth with a rinse compound.
4. Use non-abrasive toothpaste and a medium-soft brush for daily care. Pain may be felt at the site of the injection for several days, but it usually passes by the third week. Use of a soft brush will help to reduce pain.
5. Use fluorine gels. The dentist will help you choose the most appropriate option. The composition should be applied to the teeth twice a day, which will protect the teeth from cavity damage and can extend the service life of the seal. [2, 4, 6]



Picture 5. Cavity in the section

II. METHODS OF RESEARCH

This study was conducted in Novosibirsk at the Skydent dental clinic. A 48-year-old male patient was admitted and was diagnosed with moderate cavity of the 2nd molar of the lower jaw. The patient complained of acute, sometimes cutting pain in the area of the decaying tooth, the inability to eat and chew food.

On the same day of admission the patient was carried out the appropriate treatment.

A sequential scheme of treatment of middle cavity:

1. Local anesthesia (optional). Anesthetics can be used in the form of aerosols, injections, and General anesthesia.
2. Cleaning the entire tooth from plaque.

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3.Cleaning of the carious cavity using a boron machine. The dentist removes all the affected tissues from the carious cavity, wipes off the enamel edges that hang over the cavity, and forms a cavity that would be convenient for filling and would contribute to the reliable retention of the filling. The greatest care is required for deep cavity: when using the boron machine, the doctor may damage the wall of the cavity and penetrate into the pulp. Therefore, the bottom of the cavity is cleaned manually, using special dental "excavators".

4.Decontamination of the cavity – its treatment with an antiseptic solution. Usually use a 2% solution of chlorhexidine, special gels.

5. Laying a special pad on the bottom of the cavity. It is carried out if the carious cavity has a large depth.

6. Treatment of the walls of the carious cavity with adhesives-substances that contribute to a more reliable connection of dental tissues with the filling material.

7. The filling of carious cavity. There are three types of fillings: metal compositions, composite materials, and ceramics. The ceramic and composite materials match the color of the tooth enamel.

8. Sanding. After the seal has hardened, the doctor should wear it off so that it does not interfere with normal chewing and biting, and does not cause the patient discomfort.

At the end of the dental operation, the patient was advised not to drink or eat for two hours. To care for the oral cavity has been recommended toothpaste R. O. C. S.

III. RESULTS

A month after the operation, the patient arrived for a second appointment. At the examination, the seal was clean, undamaged, and the condition of the oral cavity is good. The patient followed the recommendations given by the doctor. According to him, after the filling, the toothache disappeared, the patient began to eat normally.

IV. DISCUSSION

Among the different options for filling, the doctor should be able to choose the right way to perform the operation-it depends on the degree of damage to the tooth by cavity. The deeper the cavity, the more difficult the operation is. In this case, it is important to correctly determine the extent of the lesion – most often this can be done with a simple examination of the oral cavity, but sometimes the dentist has to resort to other diagnostic methods: radiography, fluorescent stomatoscopy, vital staining or laser diagnostics.

V. CONCLUSION

After the tooth filling operation, the patient's pain symptoms disappeared, and the patient's quality of life improved noticeably. The filling scheme described by a dentist can be recommended for the treatment of moderate cavity

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