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WEDGE-SHAPED DENTAL DEFECT: MODERN TREATMENT OF THE DISEASE IN THERAPEUTIC DENTISTRY

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Abstract: Currently, there is a significant increase in the prevalence of non-carious lesions of the hard tissues of teeth and, in particular, wedge-shaped defects. A wedge–shaped defect is a kind of damage to the dental tissues located near the necks of the teeth and shaped like a wedge with the base to the neck of the tooth and the tip to the cutting edge or chewing surface of the crown. In recent years, many modern methods of treating wedge-shaped defects have been developed and implemented to help patients restore the aesthetics and functionality of their teeth. Modern dentistry offers a number of effective methods of treatment and management of this disease.
Keywords: wedge-shaped defect, non-carious lesion of hard tissues, vestibular surface, hyperesthesia, remineralizing therapy, fillings

Beautiful and healthy teeth can certainly be called a man's calling card. However, dental science distinguishes between many diseases that strongly affect the health and appearance of the oral cavity. The most common is caries, when, due to various factors, the process of demineralization of the hard tissues of the tooth begins. Caries is the cause of many diseases with very serious consequences. However, there is also a group of so-called non-carious lesions. A relatively little–studied and unpleasant problem, the wedge-shaped defect, also falls into this list. Recently, dentists have been encountering it more and more often.

A wedge–shaped tooth defect is a non-carious lesion of hard tissues, which is one of the pathologies that occur after teething. This defect is shaped like the letter "B" or a wedge located in the cervical region on the vestibular surfaces of barrel-shaped crowns, mainly premolars and canines, both on the lower jaw and on the upper jaw, where the tip of this defect always looks towards the pulp chamber. As a rule, this pathology damages symmetrical teeth, which feel the greatest stress during chewing. The morphological features of this defect are that the cavity is dense, smooth and shiny, visually such a defect is clearly limited from healthy tissues on the vestibular surface. Recently, the number of patients with non-carious pathologies, namely with wedge-shaped defects, has increased significantly.

Pronounced stages of wedge-shaped defects are more common in middle-aged and elderly people, but initial manifestations are also observed at a young age.

According to a number of studies, the prevalence of wedge–shaped defects has increased rapidly in recent years, especially among young people as a result of exposure to adverse environmental factors such as improper brushing with hard brushes and abrasive oral hygiene products, as well as exposure to acids.

There are four stages of the development of a wedge-shaped tooth defect:

And the station is the initial changes from the point of view of an invisible tissue discovery and a stranger. When stained with a 5% alcohol solution of iodine, a thin strip is visible.

Stage II, b – superficial slit-like lesions up to 0.2 mm deep and 3-3.5 mm long near the enamel-cement border with a shiny surface and pronounced hyperesthesia. They are well stained with a 5% alcohol solution of iodine, but are not visible when stained with a methylene blue solution.

At stage III, medium–sized lesions formed by two planes at an angle of 40-45 ° with a depth of 0.2–0.3 mm and a length of 3.5–4.0 mm with a yellowish color of smooth dentine are well stained with a 5% alcohol solution of iodine, but are not stained with a solution of methylene blue. Hyperesthesia is moderate.

The fourth station is large, lasting 5 hours, and most of all, with an expression of deep respect, dentine has woven teeth into the coruncular floor, bright, bright confidence and a new edge. They are well stained with a 5% alcohol solution of iodine, they are not stained with a solution of methylene blue. Hypotension is pronounced strongly.

Stages I and II are more common in young patients (under 30 years of age), in III and IV they usually develop in middle–aged and elderly people (40-60 years and older).

Treatment of a wedge-shaped defect includes local and general therapy.

1. General treatment involves mandatory treatment of a common disease. Inside, medications containing calcium, phosphorus, trace elements, and vitamins are prescribed. The course duration is 1 month.

2. Local treatment consists of preliminary removal of dental deposits – professional oral hygiene, tooth drying, coating teeth with fluoride-containing varnish, followed by drying the applied varnish, as well as brushing teeth with phosphate-containing toothpastes and their applications for 15 minutes daily during the entire treatment period. Fluoridation is necessary to strengthen the enamel, reduce sensitivity to mechanical stress, as well as to acids released by cariogenic microorganisms.

First of all, this is the development of a clinical effect that no one else in the world has, including patients with chronic heart failure. Remineralizing therapy consists in strengthening the enamel by introducing trace elements into hydroxyappatite to saturate the mineral components of the demineralized surface layers of exposed teeth necks when applying solutions containing calcium, fluorine, phosphorus, potassium, and magnesium to the surface of hard tissues. G.B. Shtorina proposed a differentiated approach to the treatment of non-carious lesions, depending on the severity of hyperesthesia. In the first degree of dentin hyperesthesia, the use of local remineralizing drugs containing glycerophosphate or calcium gluconate is sufficient, in the second – a combination of local remineralizing therapy with the use of calcium phosphorous preparations inside. At the third stage, it is necessary to use complex remineralizing therapy, including electrophoresis of calcium and fluorine preparations with endogenous use of phosphorus-calcium compounds.

In non-carious lesions, remineralizing therapy can only be used as a symptomatic treatment method for obliteration of dentinal tubules and reduction of sensitivity of exposed dentin, since in this case the protein matrix and the entire enamel in the area of the defect are destroyed, and there are no changes in the microstructure and mineralization of the enamel along the periphery.

The first clinical studies of stages III and IV have shown therapeutic and orthopedic interaction. To prevent the appearance of new wedge-shaped defects and stabilize existing ones, including under the seal, repeated courses of general remineralizing therapy 1-2 times a year and topical applications of phosphate-containing pastes 2-3 times a week are necessary. To achieve optimal results, it is recommended to dissect dentin to a depth of 1 mm to remove the obliterated layer and excise clinically unchanged enamel along the periphery of the lesion up to 3-5 mm, depending on the severity of the defect. In the case of caries development in the area of the bottom of the wedge–shaped defect, additional preparation of hard tissues is required in order to completely remove carious dentin with staining with caries markers, as well as extended preparation - removal of altered areas of enamel with microcracks, overhanging edges and areas of hypermineralized dentin.

Currently, clinicians widely use vitremer glass measuring materials ("ZM ESPE") before treatment. Thanks to nanotechnology, modern materials are more aesthetically pleasing, have high strength, and have a good gloss, but retain the fluorine-releasing ability of traditional glass ions and are less sensitive to the presence of moisture than composites.

Stages of sealing of wedge-shaped defects:

1) anesthesia (conduction or infiltration), because there is a minimum thickness of enamel and dentine in the cervical region of the tooth, and the neck of the tooth is the most sensitive area;

2) professional cleaning of the tooth from plaque and tartar using an ultrasound scaler and drug treatment with 0.02% furacilin solution;

3) the first clinical studies of the III and IV stages of preparatory work, on the basis of which demineralization of teeth was revealed;

4) drug treatment with 0.05 chlorhexidine solution %;

5) installation of retraction threads impregnated with vasoconstrictor and insulated with cotton pads;

6) installation of the cervical matrix as needed;

7) etching of enamel and dentin is carried out with 37% orthophosphoric acid gel, which forms microscopic roughness on the tooth surface for up to 60 seconds under KPM and 5 seconds under CIC. to remove the "lubricated" layer, as the CIC has chemical adhesion to dentin, enamel and cement without acid etching. The mechanism of adhesion is that the carboxylate groups of the polyacrylic acid molecule form chelated compounds with calcium hydroxyapatite of detin and enamel; as well as hydrogen-type

bonds with dentin collagen, resulting in high marginal stability and low micro-flow at the border of the filling with tooth tissues.;
8) washing and drying the surface of the defect until the enamel reaches a matte finish, dentin – a wet sparkle;
9) isolation from saliva;
10) applying the adhesive twice in a thin layer with light rubbing movements without pressure, followed by polymerization for 10 seconds. under KPM, once – under JIC;
11) sealing using a fluid form of photopolymer fillings using the technique of "directed polymerization";
12) surface finishing – grinding with peak-shaped borons with red and yellow notches, discs of varying degrees of abrasiveness, polishing with silicone heads and brushes with polishing paste;
13) coating with insulating varnish on the CIC and the surrounding enamel with polymerization for 10 seconds;
14) recommend not to use products with coloring food pigments during the day.

Conclusions:

In the treatment of wedge-shaped defects, it is necessary to conduct a competent and complete diagnosis with a differentiated and integrated approach to treatment, depending on the severity of hyperesthesia, with mandatory pre-treatment of local and, if necessary, general remineralizing therapy using specific preparation techniques and materials with a high coefficient of elasticity, tolerance to the presence of fluid, ideal marginal fit, and remineralizing properties., such as double-curing glass ionomer cements.

From all of the above, it follows that prevention must be followed. Prevention of non-carious dental lesions and wedge-shaped defects consists in following the simple recommendations of the dentist. They are aimed at eliminating the cause of defects:

• Mastering the skills of proper toothbrush use. Her movements should be frequent, but not strong. The direction and nature of the movements are sweeping, from the gum to the chewing surface.
• Correct choice of toothbrush hardness. The bristles are individually selected.
• Visit the dentist regularly, at least twice a year. Early detection of wedge—shaped defects is the key to successful treatment.
• If necessary, undergo a course of remineralizing therapy to strengthen the enamel.
• If malocclusion is detected, consult an orthodontist.
• Timely treatment of general somatic diseases of the body.

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