SJIF Impact Factor (2023): 8.574| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 11 | November 2023 - Peer Reviewed Journal

NON-CARIOUS TOOTH DAMAGE - SYMPTOMS AND TREATMENT

Djaloliddinova Shakhlo Djamolidinovna
Teacher, Department of Dentistry and Otorhinolaryngology,Fergana Institute of Public Health Medicine Uzbekistan

ABSTRACT
Non–carious lesions of the teeth are a group of diseases, the occurrence of which is not associated with the influence of a microbial factor. The main complaints are reduced to the appearance of an aesthetic defect. Occasionally hyperesthesia occurs.
KEY WORDS: *teeth, modern medicine, non–carious lesions, diagnosis, causes and classification, symptoms, treatment.*

Non–infectious destruction of enamel and dentin - non-caries-related damage to the hard tissues of teeth. They develop immediately after birth or at a more mature age. According to statistics, non–carious tooth damage is the second most common disease of the oral cavity after caries. It entails many unpleasant consequences – painful sensations, high sensitivity, dysfunction of the dental system, an unaesthetic smile.

Non-carious lesions of the teeth are accompanied by the destruction of hard tissues. Diagnosis is based on complaints, anamnesis of the disease, clinical examination data and the results of additional research methods. Treatment of non-carious lesions of the teeth is aimed at restoring the mineral composition of hard tissues, eliminating aesthetic defects, normalizing the function of chewing.

Non-carious dental lesions develop in 5-20% of the population. Most often they occur before teething - in the prenatal and infantile period. The reason in such cases is the mineralization of hard dental tissues or a violation of their differentiation and normal development. Differentiation of tissues is the transformation of initially identical tissues into specialized ones that perform certain functions.

The development of non-carious lesions of the teeth contribute to:

- Genetic Disorders;
- Direct and/or indirect effects on a child who has the beginnings of teeth, chemical and physical factors (for example, injuries, blows, the influence of harmful substances and factors exceeding permissible concentrations and doses);
- Taking medications containing heavy metals, antibiotics and hormones by the mother during pregnancy or by the child during the first year of life;
- Bruxism, violation of the closure of the dentition and mechanical damage during cleaning.

Non–carious dental lesions are diseases accompanied by progressive destruction of enamel and dentin, impaired chewing function, aesthetic defect. There is an obvious steady increase in this pathology with age. In people aged 18-25, the intensity of acquired non-carious lesions of the teeth is 5%, whereas at the age of 45-65, pathological erasability, hyperesthesia and wedge-shaped defects are detected in every second patient. Enamel erosion is more common in older men. Fluorosis is diagnosed in regions where the level of fluoride in 1 liter of drinking water exceeds 1.5 mg. The population frequency of imperfect amelogenesis is 1:7 000-1:14 000, type 1 imperfect dentinogenesis is 1:50 000, type 2 imperfect dentinogenesis is 1:8 000. The prognosis for non-carious lesions is determined both by the nature of the pathology and the time of occurrence, and by the timeliness of patients' treatment in a medical institution.

Causes and Classification

Failure at the stage of formation, mineralization can occur both during the period of follicular development of teeth, and after their eruption. The main causes of systemic hypoplasia are considered to be metabolic disorders, acute infectious diseases, diseases of the digestive system. Local hypoplasia develops as a result of trauma or as a complication of chronic periodontitis of baby teeth. Fluorotic non-carious dental lesions occur in people who live for a long time in an area with an increased level of fluoride in drinking water. Fluorosis in childhood can be caused by the use of fluoride-containing paste for brushing teeth that does not correspond to the age of the child.
Hereditary non-carious lesions of the teeth (imperfect dentinogenesis, imperfect amelogenesis) develop due to mutation of genes responsible for the formation of hard tissues. With hemolytic disease of infants, porphyria, as well as as a result of taking antibiotics from the tetracycline group by a pregnant woman or child, discoloritis (endogenous pigmentation of teeth) may occur. The enamel color change is also possible during teething after injury, when using silver amalgam as a filling material, in the case of canal obturation with a resorcinol-formalin-based siller.

The reasons for the wedge-shaped defect are considered to be improper brushing of teeth, the use of a brush with stiff bristles,

SJIF Impact Factor (2023): 8.574| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 11 | November 2023 - Peer Reviewed Journal

a paste of high abrasiveness. Multiple wedge-shaped defects are one of the symptoms of periodontal disease. Pathological tooth erasure occurs with endocrine disorders (dysfunction of the parathyroid glands) as a result of articulatory overload of the incisors with terminal defects of the dentition. Such a form of non-carious tooth damage as enamel erosion is often detected in patients with thyrotoxicosis. The development of enamel necrosis can provoke diseases of the central nervous system, intoxication of the body, increased production of thyroid hormones.

Non - carious lesions are conditionally divided into two groups: Congenital non-carious lesions of the teeth. This category includes systemic and local hypoplasia, enamel hyperplasia, fluorosis, genetically determined abnormalities of the development of hard tissues (imperfect amelogenesis, imperfect dentinogenesis, dentin dysplasia), endogenous tooth pigmentation.

Acquired non-carious lesions of the teeth. This group includes fluorosis, wedge-shaped defects, pathological erasability, necrosis and erosion of enamel, exogenous pigmentation of teeth.

Symptoms of non-carious dental lesions

With systemic hypoplasia, symmetrically located spots of yellow or chalky color are detected on the vestibular surfaces of the anterior teeth, the tubercles of the molars and premolars. With hypoplasia, there may be areas completely devoid of enamel. Hyperplasia, on the contrary, is characterized by the additional formation of enamel in the form of droplets up to 4 mm in diameter, located in the cervical zone. Pathology is detected in both temporary and replaceable bite. With fluorous non-carious lesions of the teeth, painless pigmented areas appear, the color of which, depending on the concentration of fluoride in drinking water, can vary from chalky, light brown to black. When probing, the enamel is hard, there is no loss of gloss. With chalky-speckled, dashed, spotted forms, enamel loss does not occur, whereas erosive and destructive forms of fluorosis occur with pronounced signs of pathological erasability.

In patients with hereditary non-carious lesions of the teeth, namely with imperfect amelogenesis, the enamel becomes thinner. There are cases of complete or partial enamel aplasia. Multiple depressions are detected on the vestibular surfaces. With imperfect dentinogenesis of type 1, only the color of the teeth changes (the enamel becomes watery gray), the size and shape remain within the normal range. Root fractures are often diagnosed. With imperfect dentinogenesis of type 2, teeth acquire an amber hue. Calcification of the pulp chamber and root canals begins even before the eruption. The loss of hard tissues leads to a decrease in the lower third of the face. Patients experience pain in the temporomandibular joint.

Hemolytic disease of the newborn, erythropoietic uroporphyria, tetracycline intake can lead to non-carious lesions of the teeth. Due to rhesus conflict, the color of the enamel changes from gray-blue to brown. At the same time, the enamel structure is imperfect, there are signs of systemic hypoplasia. Staining of teeth in red is observed in porphyria. Yellow-gray pigmentation is detected after taking tetracyclines. Wedge-shaped defects occur in the cervical zone on the vestibular surface of the teeth, have the shape of a triangle with a vertex directed to the occlusal surface. When probing, the enamel is dense. When erosion occurs on the enamel from the vestibular side of the front teeth, symmetrical defects of a rounded shape appear. In patients with enamel necrosis, spots form on the teeth with a softening area in the center, the color of the spots varies from chalky to dark brown. There is an increased sensitivity to various stimuli.

The most common non-carious lesions of the teeth are pathological abrasion, erosion of the hard tissues of the tooth, enamel hypoplasia, wedge-shaped defect and fluorosis. Their main symptom is a lesion of hard tissues, which is visually noticeable: the enamel loses its luster, whiteness and transparency, becomes dull, spots and other defects appear on it. The loss of hard tissues causes the second characteristic symptom - hypersensitivity of the teeth.

Various forms of non-carious lesions of the teeth are often combined with each other, for example, one patient has erosion, pathological erasability and a wedge-shaped defect.

Each non-carious tooth lesion is manifested by its own symptoms:

Erosion is an oval, round or irregularly shaped defect, the bottom of which has a shiny, smooth and dense surface. It most often develops on premolars, canines and incisors (except for the incisors of the lower jaw).

Wedge-shaped defects first have the shape of a slit, then a wedge or V-shaped. They mainly develop in the cervical region. They can affect all teeth, but are more common on the incisors of the lower jaw, canines, molars and premolars, appear symmetrically on both sides.

Erosion and wedge-shaped defect. Pathological erasability develops simultaneously on all teeth, it can be vertical, horizontal and mixed. With the horizontal type, the cutting edges of the teeth, bumps and chewing surfaces are erased, with the vertical type, tissue loss occurs on the outer or inner surface of the teeth, with mixed these manifestations are combined. The patient feels that the tooth tissues are thinning and losing volume. There is pain when eating cold, hot, sour and sweet.

Hypersthesia of teeth is an increased sensitivity of enamel to chemical, mechanical and temperature influences. An unpleasant reaction can occur to acidic foods - fruits, berries, as well as hot, cold foods and drinks. Soreness can also appear when touching the enamel with a toothbrush. The main cause of pathology is a violation of the integrity of dental tissues, not associated with caries.

SJIF Impact Factor (2023): 8.574| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 11 | November 2023 - Peer Reviewed Journal

Enamel hypoplasia develops due to a violation of the metabolism of proteins and minerals in the body of a child or fetus, which leads to changes in the density and structure of tooth tissues. Hypoplasia can also be caused by the effect of local factors on the dental rudiment.

Fluorosis, presumably, develops due to the toxic effect of fluoride through the blood on the enameloblasts (cells of the inner layer of the dental embryo), which leads to improper development of enamel. The causes, predisposing factors and the mechanism of such an impact are not fully understood.

In the pathogenesis of a wedge-shaped defect, chemical and mechanical theories are distinguished. In the first case, the main active factor is acids, in the second - a toothbrush. However, these theories have many contradictions, and they have not been widely recognized by the scientific community.

In the pathogenesis of tooth tissue erosion, the leading role is given to the chemical effect of acids coming from food and as a result of esophageal reflux.

Diagnosis of Non-Carious Dental Lesions

Diagnosis of non-carious dental lesions is reduced to collecting complaints, compiling a medical history, conducting a physical examination and additional research methods. During the examination of a patient with hypoplasia, the dentist identifies single symmetrical matte or yellow spots on the surface of the teeth. In some areas, enamel aplasia may be observed. The vestibular, oral surfaces, as well as the mounds of molars and premolars are affected. With fluorosis, multiple stripes, spots or dots of yellow color are detected. With erosive and destructive forms, enamel chipping occurs, signs of pathological erasability are expressed, there is a decrease in the hard tissues of the teeth. Hyperplasia occurs with the formation of enamel droplets in the cervical zone with a diameter of up to 4 mm.

With hereditary non-carious lesions of the teeth (imperfect amelogenesis), the enamel quickly thinns, cup-shaped depressions appear on the cheek surfaces. As a result of pathological erasability, the height of the bite decreases. In patients with imperfect dentinogenesis, the teeth have an amber color. The shape and size are usually within the normal range. The radiograph reveals progressive obliteration of the root canals, a decrease in the volume of the pulp chamber. The wedge-shaped defect is localized in the cervical zone from the vestibular surface of the teeth, has the shape of a triangle with the base facing the gingival edge. The enamel in the affected area is dense and smooth.

According to the degree of lesion , non - carious defects are:

- Systemic - all teeth or a group of teeth that were formed in one period are damaged;
- Focal - several teeth located nearby and developing in one period are affected;
- Local - only one tooth is affected.

Non - carious lesions of the teeth occur in two phases:

- Exacerbation (acute phase);
- Remission (stabilization of the pathological process).

Exacerbation and remission replace each other, the duration of each period varies. During erosion, symmetrical saucer-shaped defects are detected, which are localized on the buccal surface of the front teeth. Unlike erosion, with acid necrosis of enamel, a softening zone is determined in the central part of the defect. When applying methylene blue staining, non-carious lesions of the teeth are not observed. During probing, the enamel is dense. A decrease in indicators is observed with imperfect dentinogenesis, tooth pigmentation due to trauma. Differentiate non-carious lesions of teeth with a carious process. The examination is carried out by a dentist-therapist.

Treatment of Non-Carious Dental Lesions

The primary task in identifying non-carious lesions of the teeth is to restore the mineral composition of hard tissues. Topically, applications of calcium- and fluorine-containing drugs are prescribed. Electrophoresis procedures are also shown for this purpose. To eliminate the aesthetic defect formed as a result of non-carious tooth damage, glass ionomer cements are used in childhood, characterized by high biocompatibility, good adhesion to enamel and dentin, no need for acid etching, and a caries-protective effect. Later, lamination with composite or ceramic veneers is used to restore teeth in dentistry.

In case of non-carious lesions of hereditary teeth, prosthetics is indicated to preserve hard tissues. Patients with fluorosis are advised to limit the use of foods rich in fluoride. Calcium-containing drugs are prescribed inside. Fluorotic spots are to be sanded with subsequent restoration of teeth with composites, ceramic crowns and veneers. To eliminate pigmentation, combined (external and intra-channel) bleaching is carried out. The prognosis for non-carious dental lesions is determined by both the nature of the pathology and the time of occurrence, and the timeliness of patients' treatment to a medical institution, as well as the level of treatment.

With timely and high-quality dental treatment, it is possible to preserve the tooth, while its functionality will remain at the same level.

Prevention of Non-Carious Tooth Damage

To prevent fluorosis, excessive consumption of fluoride should be excluded: drink water with a low concentration of this substance and do not swallow fluoride-containing toothpastes and mouthwash. Children under 6 years of age cannot use such pastes.

To prevent hypoplasia, it is necessary to avoid infectious diseases during pregnancy. It is important to carefully take care of the health of pregnant women, young children and treat somatic diseases in a timely manner.

SJIF Impact Factor (2023): 8.574| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 11 | November 2023 - Peer Reviewed Journal

To slow down the development of the wedge-shaped effect, it is recommended to use soft toothbrushes and fluoride-containing toothpastes.

In case of erosion, it is necessary to improve hygienic dental care, eat less acidic foods, use soft toothbrushes and pastes with a high content of fluoride.

REFERENCES

1. *Alvarez-Arenal A., Alvarez-Menendez L., Gonzalez-Gonzalez I. et al. Non-carious cervical lesions and risk factors: a case-control study // J Oral Rehabil. - 2019. - № 1. - P. 65–75.*
2. *Wei W., Pang S., Sun D. The pathogenesis of endemic fluorosis: Research progress in the last 5 years // J Cell Mol Med. - 2019. - № 4. - P. 2333–2342.*
3. *Lussi A. Dental erosion: from diagnosis to therapy. - Basel: S. Karger, 2006. - 220 p.*
4. *Pace F., Pallotta S., Tonini M. et al. Systematic review: gastro-oesophageal reflux disease and dental lesions // Aliment Pharmacol Ther. - 2008. - № 12. - P. 1179–1186.*
5. *Kanzow P., Wegehaupt F. J., Attin T., Wiegand A. Etiology and pathogenesis of dental erosion // Quintessence Int. - 2016. - № 4. - P. 275–278.*
6. *Curtis D. A., Jayanetti J., Chu R., Staninec M. Managing dental erosion // Todays FDA. - 2012. - № 4. - P. 44–45.*
7. *Struzycka I., Rusyan E., Boguslawska-Kapala A. Tooth erosion - a multidisciplinary approach // Pol Merkur Lekarski. - 2016. - № 236. - P. 79–83.*