# SOME ASPECTS OF PATHOGENESIS OF NONCARIOSIS DISEASES AND ITS INTERRELATION WITH HORMONAL DISORDERS

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**Abstract:** Chronic somatic and endocrine diseases occur much more often in persons with non-carious lesions. The detection of a pathological occlusion showed that it is diagnosed with high frequency in patients with wedge-shaped defects and combined non-carious pathology. The pathology of periodontal disease, as an unfavorable situation in the emergence of non-carious pathology, is diagnosed much more often in patients with wedge-shaped defects and associated pathology. Most often, the combined pathology is indicated for hormonal disorders.

**Key words:** non-carious lesions of the teeth, wedge-shaped defects of the teeth, cervical defects of the teeth, ablation

## INTRODUCTION

Diagnosing and treating lesions of hard tissues of teeth, the most significant task of the modern dentistry is to make a decision that is optimal and balanced from the medical, economic, aesthetic, biomechanical and ergonomic points of view, in relation to a specific clinical situation. The fundamental basis for restorative treatment of teeth affected by caries or having defects in hard tissues of another is nature, is the understanding of the various causes and conditions of their origin, the evaluation of the extent of damage, and the level of material and technical capabilities of modern dentistry. The most important condition of the effectiveness of treatment and prophylactic measures is the availability of a clear picture of the etiology and pathogenesis of the disease, as well as the methods of its diagnosis. Interest in this issue is dictated by the fact that incorrect identification of causes and erroneous diagnosis of these lesions entails a disruption of approaches to prevention and therapy, which causes further progression, development of complications and new pathologies and [2, 8, 9].

In recent years, the prevalence of non-carious lesions of teeth has significantly increased erosion, wedge-shaped defects, pathological erosion

and necrosis, hypersensitivity. High-quality and long-term sealing of the cervical defects of hard tooth tissues, primarily non-carious origin, is also one of the urgent problems of therapeutic dentistry, since the appearance of seals after the treatment of erosion, wedge and other defects even with the use of modern composite materials and adhesives is found in the majority of the examined. Almost all researchers note serious violations of mineralization and microstructure of hard tissues of teeth in non-carious lesions. In this connection, the problem of non-carious lesions of the teeth in the cervical region: erosion, wedge-shaped defects, pathological erosion and necrosis, increased sensitivity [7, 13, and 16] requires in-depth study.

Cuneiform defects of the teeth occur 10-12 times more often than before [13]. The expressed stages of wedge-shaped defects are more often observed in people of average and elderly age, but the initial manifestations are diagnosed in young people. Until now, there is no consensus on the etiology and pathogenesis of wedge-shaped defects. Various methods of treatment of wedge-shaped defects of teeth are described depending on the severity of pathological changes. However, the recommendations for the treatment of wedge-shaped defects are contradictory. Some authors recommend that they perform filling of wedge-shaped defects with compomers or microhybrid composite materials without preliminary preparation of hard tooth tissues [5, 12]. Other authors consider, the most effective method of treatment of the developed wedge-shaped defect is its expanded preparation and sealing [16]. Analysis of the results of treatment of wedge-shaped defects shows that seals from many filling materials are not sufficiently durable; a large number of edge defects of the fillings are noted. A special place among cervical lesions of hard tissues of the teeth is occupied by cervical stress injuries of enamel or ab- fraction. The concept of ab- fraction is still controversial. According to the hypothesis put forward by the authors, abruption is the fourth kind of damage to hard tooth tissues and fits into the stresses [6, 27]. Aesthetic defects of streets of different ages are associated with abfractic lesions. Treatment of such lesions is recommended to be carried out after thorough assessment of the state and correction of occlusion with the use of composite or glass-ionomer cement restorations and / or termination of the effect of etiological factors, for example, bruxism. On the other hand, some authors do not see differences in therapeutic tactics in such non-carious lesions as erosion and ab- fraction, classifying them as V lesions of hard dental tissues [10, 11]. As shown by clinical observations, the results of sealing of ablative defects by composite materials are unsatisfactory, which requires the development of new therapeutic and diagnostic approaches and the use of new restoration materials. Thus, the analysis of these literatures, devoted to cervical defects of non-carious teeth, indicates the vagueness and inconsistency of data on etiology, pathogenesis, differential diagnosis

and the choice of a method of treatment of these types of pathology, which results in low efficiency of treatment of cervical lesions hard tissue of the teeth in clinical conditions. All this requires in-depth study to understand and systematize data on this type of pathology and develop recommendations for its diagnosis, treatment and prevention. In connection with the actual, important and actual problem of modern dentistry in scientific and practical terms, a comparative study of the clinical features of cervical lesions of hard tissues of non-carious teeth with systematization of the obtained data, refinement of the mechanisms of their origin, and the development of individually oriented diagnostic and therapeutic algorithms [1, 2, 18, 19, 21].

Solving problems of improving dental care for the population can not be successful without a scientific analysis and generalization of practical experience in restructuring this type of assistance in specific conditions. The urgency of the problem is determined by the fact that at the present time, in the treatment of caries and non-carious lesions of hard tooth tissues, aesthetic requirements are raised, as well as financial and marketing issues. At the same time, the medical, biomechanical aspects of this problem are underestimated or ignored, there are no medical and technological standards for the provision of dental care, including the issues of aesthetic dentistry. This approach leads to a high incidence of complications and adverse events, a deterioration in the quality of dental care for the population, and the emergence of conflict situations. Important from the point of view of science and practice is the development, approbation and implementation of the concept of integrated dental functional-aesthetic therapeutic care and the prevention of non-carious lesions of hard tissues of the cervical dentition, developed on the basis of modern methods of biochemical and pathophysiological studies.

Faye V. and Kawagoe T. believe that the leading role in the emergence of non-carious cervical lesions is played not only by acid demineralization, but also by the disturbed mineralizing function of saliva that provides the processes of remineralization of enamel [22, 24]. It is known that the composition and properties of saliva depend not only on the equilibrium in the biosystem "oral cavity", but also on the functioning of the human body as a whole. Therefore, the relationship between the emergence of non-carious cervical lesions and background somatic pathology, proved in a number of research scientists is logical [2, 7]. Therefore, according to Kuzmin E.M. (2005), with the erosion of teeth, various endocrine diseases occur with a frequency of 65.4-71.2%, with combined forms of lesions - 35.7-77.8%. V.A. Drojjhina et al., note that 88.3% of women with non-carious lesions of teeth have abnormalities of the ovaries [7]. It is known that with endocrine diseases the mineral metabolism changes dramatically, in the saliva the level of calcium and inorganic phosphate decreases, the

mineral potential of saliva and its buffer properties decrease. Numerous studies indicate that the cause of the appearance of wedge-shaped defects is improper dental care, namely enhanced tooth cleaning, violation of the method of tooth cleaning (horizontal movements), advantageous right-handedness, the use of hard toothbrushes and abrasive toothpastes [9, 17, 18].

Kawagoe T., studying the effect of horizontal movements on the onset of cervical defects, received various clinical forms of lesions after 80 hours of cleansing in the experimental machine. In 50% of cases, abrasions were obtained experimentally in the form of a wedge, 28% had mixed lesions, and in 22% - round-shaped lesions [24].

Jackson R.J., Madani, Michael J.A., investigating the surface of wedge-shaped defects with the help of scanning electron microscopy, found the presence of one or several horizontal grooves 0.2-0.3 mm wide at the tip of the wedge. Near these large furrows we observed a more or less parallel grid of thin filamentary defects. Based on this, the authors confirmed the traumatic origin of wedge-shaped defects associated with horizontal brush movements during tooth cleaning [25, 26, 27]. Pashley D. et al. hypothesized the possible role of stretching force in the etiology of cervical dental lesions. They suggested that with traumatic occlusion, lateral loads can cause bending of the teeth, i. E. tensile forces with such bends break the chemical bonds in the crystalline structures of the enamel and dentin, and as a result, such a structure becomes more prone to dissolution and abrasion, which leads to the appearance of wedge-like lesions - abrupt fractures [28]. Teiles D. believes that the results of their research provide a biomechanical explanation of the theory of ablative defects. They demonstrated in an experiment on artificial models that occlusal loading plays an important role in the formation of ab- fractive defects [29]. West N.X. in 61 patients with non-carious cervical lesions in 94.5% of cases, occlusive injury was identified [32]. W.G. Young, F. Khan (2002) also do not support ablative theory as the main cause of cervical non-carious lesions. According to several authors, foci of tooth destruction in the form of wedge-shaped defects often appear on the side where there is no occlusal load [10]. It was noted that wedge-shaped defects are combined with parodontium diseases. Russian scientists believe that the occurrence of wedge-shaped defects is associated not only with mechanical factors, but also with somatic diseases that lead to disruption of mineral metabolism in the human body [7]. So, according to IM Semchenko, different endocrine diseases occur in case of clinical defects in 38.4-52.4% of cases [14]. According to Afanasov F.P., the connection between the wedge-shaped defect and somatic diseases is explained by the fact that mineral metabolism is disrupted in this pathology [3].

In order to reveal the mechanism of formation of wedge-like defects in hard tissues of teeth V.Kleont'ev et al., Carried out a comparative electron microscopic analysis of various sites of damage [10]. It is established that

the most significant destructive changes are noted at the junction of the wedge-shaped defect (the bottom of the wedge) and along the very edge of the wedge wall at the boundary with the cornea. Studies of the surface of the walls of the wedge revealed their structural heterogeneity. Most often, one of the walls of the wedge looked smooth (smooth), while the other had all the signs of destruction. The boundary between the crown and the root, as a rule, looked blurred and had fuzzy contours, since the process of demineralization affected the structures of enamel and dentin. Results of research AV. Tsimbalistova et al., Showed that the processes of de- and hypermineralization occur in the surface layers of dentin and do not affect the underlying dentin array, the mineralization of which is outside the lesion and practically does not change in the region of the wedge-shaped defect [16]. The demineralization of the surface layer of dentin leads to a disruption of its bond with the enamel, causes raster-breaking, and destruction of the latter. The histological carcinoma of hard tissues in the region of a wedge-shaped defect when examined by means of an optical microscope testifies to the obliteration of the dentinal tubules of the basic dentin substance in the area of defect and pulp atrophy [10]. The disturbances in the pulpal flow with wedge- TO. Loginova (2005). However, in the case of hyperesthesia of hard tissues of teeth with wedge-shaped defects, the processes of mineralization of enamel and dentin are violated, as the remineralizing potential of saliva changes [17]. Considering all the above-mentioned factors contributing to the appearance of a wedge-shaped defect, the measures of prevention are determined by the following measures: training in rational hygiene (avoiding horizontal movements of the toothbrush, applying soft brushes and pastes without aggressive abrasives); treatment of background disease of internal organs; normalization of occlusion by orthopedic or orthodontic treatment; complex remineralizing therapy. Developed wedge-shaped defects require restorative therapy; however, the safety of seals, during the treatment of wedge-shaped defects in the cervical area of the teeth, does not exceed 50% within a year [8]. From the data given above, it can be seen that in etiology, pathogenesis, prevention and treatment wedge-shaped defect has both similarity and difference.

Therefore, in recent years, the frequency of diseases of hard tissues of teeth of non-carious character has increased significantly. There is an opinion that in the occurrence of erosion and wedge-like defects, the disturbance of the mineralizing function of saliva is important. It is assumed that the level of mineralization of the surface layer of the enamel of the teeth, as well as the enhanced processes of the demineralization of the teeth, is of no small importance in the occurrence of erosion of the enamel and wedge-shaped defects. However, the study of the solubility of enamel, both in general and its main macroelements, as well as the assessment of

the level of mineralization of the surface layer with a wedge-shaped defect, was performed either on the removed teeth or directly in the defect of the lesion. Studies on the level of mineralization of intact tooth tissues and demineralization processes in patients with wedge-shaped defects in clinical conditions have not been established. However, the comparative effectiveness of these methods and the validity of their choice are not fully understood.

Summarizing the above, it can be pointed out that chronic somatic and endocrine diseases occur much more often in persons with non-carious lesions. The greatest occurrence of somatic diseases was detected in the patients with combined non-cardiosomal pathology. The detection of a pathological occlusion showed that it is diagnosed with high frequency in patients with wedge-shaped defects and associated non-cardiovascular pathology. The pathology of periodontal disease, as an unfavorable situation in the emergence of non-carious pathology, is diagnosed much more often in patients with wedge-shaped defects and associated pathology. More often, the combined pathology indicates hormonal disorders.

**REFERENCES**

1. Adyan, N. N. (2008). The use of dentine-sealing liquid in the complex treatment of non-carious lesions of the teeth (wedge-shaped defects and erosions) (Doctoral dissertation, NN Adyan).

2. Alimova, M. Ya., &Makeeva, I. M. (2007). Planirovanie i metody matematicheskoj obrabotk i rezul'tatov nauchnyh issledovani j v medicine [Planning and methods of mathematical processing of scientific research results in medicine]: uchebnoeposobie. M.: Russkijvrach, 11-32.

3. Solov'eva-Savoyarova, G. E. (2008). Nekarioznye porazheniya zubov kak markery gormonal'no-metabolicheskih narushenij u zhenshchin [Non-carious lesions of the teeth as markers of hormone-metabolic disorders in women] (Doctoral dissertation, Avtoref. dis... kand. med. nauk).

4. Afanasov, F. P. (2010). Profilaktikailechenie k linovidnyh defektov zubov s sochetannym primeneniem gidroksiapatit-iftorsoderzhashchih preparatov [Prophylaxis and treatment of liniform tooth defects with combined use of hydroxyapatite and fluorine-containing drugs] (Doctoral dissertation, AP Afanasov).

5. Archakova, T. S., Afanasov, F. P., Garazha, N. N., Savel'ev, P. A., &Romanova, L. YU. (2008). Effektivnost' primeneniya ul'tramikroskopicheskogo gidroksiapatita v sochetanii s ftorsoderzhashchimi preparatami posle otbelivaniya diskoloritad lyapovysheniya rezistent nostiisnizheniyagi perestezi i zubov [The effectiveness of the use of ultramicroscopic hydroxyapatite in combination with fluorine-containing preparations after bleaching of discolorite to increase resistance and reduce hyperesthesia of the teeth]. Klinicheskayastomatologiya, (3), 90-92.

6. Lukinyh, L. M., &Kruglova, N. V. (2011). Hronicheskijgeneralizovannyjparodontit [Chronical generalized periodontitis].Chast' I.Sovremennyjvzglyadnaehtiologiyui patogenez. Sovremennyetekhnologii v medicine, (1).

7. Gileva, O. S. (2009). Povyshennayachuvstvitel'nost' zubov [Hypersensitivity of teeth] (Metodicheskierekomendacii).

8. Drozhzhina, V. A., Kustarov, V. N., &Solov'evaSavoyarova, G. E. (2007). Vzaimosvyaz' nekarioznyhporazhenijzubov (ehrozij, klinovidnyhdefektovisochetannyh form porazheniya) s narusheniyamigormonal'nogoimineral'nogogomeostaza u zhenshchin [Interrelation of non-carious lesions of teeth (erosion, wedge-shaped defects and combined forms of lesion) with hormonal and mineral homeostasis disorders in women]. Institutstomatologii, 3(36), 104-107.

9. Koval'skij, V. L. (2003). Algoritmy organi zaci i itekhnologi i okazaniya osnovnyhvidovhirurgicheskojstomatologicheskojpomoshchi v setiklinik" Masterdent" [Algorithms of organization and technology of providing the main types of surgical dental care in the network of clinics "Masterdent"].

10. Kuz'mina, E. M. (2005). Sovremennyeprincipyprofilaktikistomatologicheskihzabolevanij [Modern principles of prevention of dental diseases]. Stomatologiyasegodnya., (3), 36.

11. Leont'ev, V. K., Kunin, A. A., Popova, T. A., Ippolitov, YU. A., Koreckaya, I. A., &Klyuchnikova, E. A. (2002). Osobennosti mikrostrukturyehmaliidentinaintaktnyhikarioznyhzubov [Features of microstructure of enamel and dentin of intact and carious teeth]: Materialy.

12. Kunin, A. A., SHelkovnikova, S. G., Belenova, I. A., Olejnik, O. I., &Hanin, A. V. (2004). The use of low-intensity laser radiation in the prevention and treatment of caries and its complications. Laser medicine, 8(3), 150-150.

13. Syomchenko, I. M. (2001). Clinical manifestations of wedge-shaped defects of teeth. Sb. Scientific work: Works of young scientists. Jubilee edition, 121-124.

14. Semchenko, I. M., &Delendik, A. I. (2007). Teeth Whitening Techniques: Teaching method.allowance. Minsk: BGMU.

15. Semchenko, I. M. (2003). The effectiveness of therapeutic and prophylactic measures for wedge-shaped defects in teeth.

16. Gazhva, S. I., Nadejkina, O. S., &Goryacheva, T. P. (2014). Implementation of the priority of prevention of dental diseases. Form and Methods. Modern issues of science and education, (6).

17. Cimbalistov, A. V., ZHidkih, V. D., &Sadikov, R. A. (2000). Clinical significance of microstructure and mineralization of hard tooth tissues in the treatment of wedge defects. News in Stomatology, (3), 12-18.

18. Addy, M. (2005). Tooth brushing, tooth wear and dentine hypersensitivity-are they associated?. International dental journal,55(S4), 261-267.

19. Bartlett, D. W., & Shah, P. (2006). A critical review of non-carious cervical (wear) lesions and the role of abfraction, erosion, and abrasion. Journal of Dental Research, 85(4), 306-312.Becker, W., Ochsenbein, C., Tibbetts, L., & Becker, B. E. (1997). Alveolar bone anatomic profiles as measured from dry skulls.Journal of clinical periodontology, 24(10), 727-731.

20. Belluz, M., Pedrocca, M., &Gagliani, M. (2005). Restorative treatment of cervical lesions with resin composites: 4-year results.American journal of dentistry, 18(6), 307-310.

21. Estafan, A. M., Furnari, P. C., Goldstein, G. R., &Hittelman, E. L. (2003, June). In vivo correlation of non-carious cervical lesions and occlusal wear. In journal of dental research (Vol. 82, pp. B183-B183). 1619 duke st, Alexandria, VA 22314-3406 USA: IntAmerAssoc dental researchi ADR/AADR.

22. Estafan, A., Furnari, P. C., Goldstein, G., &Hittelman, E. L. (2005). In vivo correlation of noncarious cervical lesions and occlusal wear. Journal of Prosthetic Dentistry, 93(3), 221-226.

23. Faye, B., Sarr, M., Kane, A. W., Toure, B., Leye, F., Gaye, F., &Dieng, M. B. (2005). Prevalence and etiologic factors of non-carious cervical lesions. A study in a Senegalese

population. Odonto-stomatologietropicale= Tropical dental journal, 28(112), 15-18.

24. Kane, A. W., Faye, B., Tour?, B., Sarr, M., ChM, L., &B?, D. A. (2004). Prevalence of non carious dental lesions in the department of Dakar. Odonto-stomatologietropicale= Tropical dental journal,27(108), 15-18.

25. Tour?, B., Faye, B., Kane, A. W., Lo, C. M., Niang, B., & Boucher, Y. (2011). Analysis of reasons for extraction of endodontically treated teeth: a prospective study. Journal of endodontics, 37(11), 1512-1515.

26. Kawagoe, T., Saruta, J., Miyake, S., Sasaguri, K., Akimoto, S., & Sato, S. (2008). Relationship between occlusal contact patterns and the prevalence of non-carious cervical lesions. J Dent Health,58, 542-547.

27. Jackson, R. J. (2000). Potential treatment modalities for dentine hypersensitivity: home use products. Tooth wear and sensitivity, 327-338.

28. Madani, A.O.S., &Ahmadian-Yazdi, A.(2005).An investigation into the relationship between noncarious cervical lesions and premature contacts. CRANIO®, 23(1), 10-15.

29. Michael, J. A., Kaidonis, J. A., & Townsend, G. C. (2010). Non?carious cervical lesions: a scanning electron microscopic study.Australian dental journal, 55(2), 138-142.

30. Michael, J. A., Townsend, G. C., Greenwood, L. F., &Kaidonis, J. A. (2009). Abfraction: separating fact from fiction. Australian dental journal, 54(1), 2-8.

31. Pashley, D. H. (2000). Potential treatment modalities for dentine hypersensitivity: in-office products. Tooth Wear and Sensitivity, 211-219.

32. Telles, D., Pegoraro, L. F., & Pereira, J. C. (2000). Prevalence of noncarious cervical lesions and their relation to occlusal aspects: a clinical study. Journal of Esthetic and Restorative Dentistry, 12(1), 10-15.

33. Tomasik, M. (2006). Analysis of etiological factors involved in noncarious cervical lesions. In AnnalesAcademiaeMedicaeStetinensis (Vol. 52, No. 3, pp. 125-136).

34. Tomasik, M. (2006). Analysis of etiological factors involved in noncarious cervical lesions. In AnnalesAcademiaeMedicaeStetinensis (Vol. 52, No. 3, pp. 125-136).

35. Tomasik, M., &Lipski, M. (2009). Frequency and etiology of noncarious cervical lesions with pulp exposure. In AnnalesAcademiaeMedicaeStetinensis (Vol. 55, No. 1, pp. 70-78).

36. West, N. X., Lussi, A., Seong, J., &Hellwig, E. (2013). Dentin hypersensitivity: pain mechanisms and aetiology of exposed cervical dentin. Clinicaloralinvestigations, 17(1), 9-19.