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PATHOLOGICAL TOOTH WEAR: FROM DIAGNOSIS TO REHABILITATION

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Abstract

Pathological tooth wear is a significant loss of enamel and dentin, leading to a reduction in occlusal vertical dimension and impairment of masticatory function. This article discusses the main causes contributing to pathological tooth wear, including malocclusion, bruxism, and harmful habits. The consequences of changes in occlusal height are also emphasized, including functional and esthetic disorders, as well as their impact on the overall condition of the oral cavity. The study is based on clinical data and diagnostic findings used to assess the degree of occlusal changes and their correction. The article presents recommendations for prevention and treatment aimed at stabilizing occlusal height and improving dental condition.

Keywords: physiological wear, loss of hard dental tissues, pathological tooth wear, occlusal height, causes of tooth wear, occlusal load, consequences of tooth wear, treatment and prevention.

Introduction

One of the most common problems in modern dentistry is the increasing prevalence of non-carious dental lesions, which according to some authors has reached 80–82%. This trend is associated with worsening environmental conditions, unfavorable socioeconomic factors, and the growing number of endocrine and other systemic diseases. Among non-carious lesions developing after the eruption of permanent teeth, pathological tooth wear is frequently observed, with prevalence rates reaching 30.9%.

It is well known that pathological and physiological wear facets of teeth are distinguished. Physiological wear, as well as minimal pathological wear not complicated by bruxism, usually does not require treatment.

According to ICD-10-C (1997), section K.03 “excessive attrition,” the term “increased tooth wear” is used to describe excessive loss of hard dental tissues caused by mechanical contact (occlusion). However, in practical healthcare, the term “pathological tooth wear” is widely applied.

Increased tooth wear is characterized by rapidly progressive loss of hard dental tissues and is accompanied by morphofunctional and esthetic changes. Excessive wear occurs not only on occlusal and incisal surfaces of antagonist teeth but also in proximal and approximal contact areas due to the cushioning function of the periodontal tissues. Friction between the tooth and exogenous agents results in tissue loss referred to as “attrition.”

The etiology of pathological tooth wear is multifactorial. Systemic diseases, quality of life, environmental and geographical factors all play a role. Structural defects of hard dental tissues, neurodystrophic and metabolic disorders, disturbances in mineralization, endocrine dysfunction, functional overload due to the loss of posterior teeth, and the action of acids significantly contribute to the development of excessive tooth wear. Morphological inferiority of hard dental tissues, overload, functional insufficiency, chemical factors, and occupational hazards are common causes of pathological wear.

Classification of Pathological Tooth Wear

M.I. Groshikov (1985) proposed a convenient clinical-anatomical classification of excessive tooth wear based on localization and severity:

- **Degree I:** slight wear of cusps and incisal edges.

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- **Degree II:** wear of enamel on cusps, canines, premolars, molars, and incisal edges with exposure of superficial dentin layers.
- **Degree III:** wear of enamel and deep dentin layers up to the pulp chamber level.

Later, H.H. Garazha and I.S. Garazha (2004) proposed another classification according to several criteria:

a) **By form:** horizontal, vertical, mixed;

b) **By severity:**

- mild (Degree I) – slight wear of superficial enamel layers;
- moderate (Degree II) – enamel wear with superficial dentin exposure;
- severe (Degree III) – deep dentin wear;

c) **By distribution:** localized, generalized;

d) **By type:** with reduction of interalveolar height, without reduction of interalveolar height;

e) **By stages:** active, stabilized.

Clinical Manifestations of Pathological Tooth Wear

Clinical manifestations of tooth wear are highly variable and may affect teeth of one or both jaws, unilaterally or bilaterally. Cases have been described where teeth on one jaw were significantly more worn than on the other. In some patients, the pattern and plane of wear are similar across all teeth, while in others they differ substantially.

Age, body reactivity, occlusion type, extent and localization of dental arch defects determine the clinical picture of hard tissue wear. Despite the diversity of manifestations, common signs of abrasion have been identified. Importantly, enamel and dentin wear occurs without softening of tissues.

The most characteristic signs of excessive tissue loss include disturbance of anatomical tooth shape, reduction of the distance between alveolar processes, changes in tooth morphology and size, dentin hypersensitivity, shortening of the distance between the subnasal point and the chin, facial asymmetry, impaired esthetics, temporomandibular joint dysfunction, and periodontal tissue damage. Interalveolar height decreases in generalized forms of tooth wear.

Treatment of Pathological Tooth Wear

The primary objective in the treatment of hard tissue wear, after identifying and eliminating etiological factors, is to prevent further progression of the condition. Various treatment methods are used depending on the severity of wear.

In the early stages, the main goal is to prevent progression and carry out preventive measures. Since reduction in occlusal height is absent or insignificant and patients usually experience little discomfort, normalization of occlusal vertical dimension is not necessary. Therefore, orthopedic treatment is mainly preventive.

Medication and physiotherapy are indicated in patients with dentin hypersensitivity. In cases where direct restorative methods are ineffective, orthopedic treatment is prescribed to restore anatomical form and function using modern fixed or removable prostheses.

The main purpose of treatment in Degree I and II wear is stabilization of the process and prevention of further progression. Selective grinding eliminates minor occlusal disturbances and thinning of protruding tooth edges caused by pathological wear. In early stages, remineralization therapy with fluoride-containing agents such as enamel-sealing liquids and fluoride toothpastes is recommended.

For pathological wear with exposed dentin prior to reconstructive therapy, combined treatment with temporary therapeutic liners and electrophoresis using 2% sodium fluoride solution is applied.

If wear is caused by the loss of a significant number of teeth, prosthetic rehabilitation is necessary to restore the dentition.

Conclusion

It is widely recognized that prevention is more economically beneficial than restoration of lost health, and this also applies to enamel wear. Preventive measures should include avoiding

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acidic beverages without a straw, using protective equipment in workplaces with abrasive particles, and regularly rinsing the oral cavity with sodium bicarbonate solution when working with acids. Patients should undergo regular examinations by highly qualified specialists.

If symptoms such as wear of anterior teeth, yellow spots on tooth surfaces, or increased tooth sensitivity appear, patients should seek dental care as soon as possible.

Modern dentistry possesses a wide range of methods for restoring hard dental tissues. Prevention of tooth wear involves complete elimination or maximal reduction of contact with harmful factors. Regular dental examinations are of great importance. In cases of chipped teeth or caries, timely restoration using high-quality filling materials, crown reconstruction, and prosthetic treatment are necessary.

Oral hygiene should be maintained using individually selected toothpaste and toothbrushes; soft-bristled toothbrushes and low-abrasive toothpaste are recommended. General health status is also important. Continuous strengthening of the immune system and periodic intake of vitamin complexes help compensate for micronutrient deficiencies and prevent premature destruction of hard dental tissues.

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