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### **CHEMICAL AND PHYSICAL FACTORS AS CAUSES OF THE DEVELOPMENT OF EROSION AND ATROPHY OF DENTAL TISSUE**

Non-cariogenic lesions, such as erosion and atrophy, are significant issues in dentistry as they substantially affect the condition of dental tissue. Erosion is caused by the chemical degradation of enamel due to the consumption of aggressive products, such as carbonated beverages, citrus fruits, and acidic foods. Atrophy, on the other hand, may occur due to aging, insufficient blood supply, or nutrient deficiencies. Understanding the mechanisms underlying these defects is crucial for developing effective preventive measures and treatment strategies [1].

The objective of this work is to study the influence of chemical and physical factors on the development of erosion and atrophy of dental tissue, as well as to assess potential methods for the prevention and treatment of these conditions.

Changes in lifestyle and diet in modern society have led to an increase in cases of erosion and atrophy of teeth. Chemical factors, such as increased acidity in the diet, as well as physical factors, such as mechanical abrasion, play a crucial role in the development of these conditions. Timely detection and prevention of these defects are critical for maintaining dental health, as they can significantly affect the functionality and aesthetic appearance of the oral cavity [2].

Erosion and atrophy have different causes and manifestations, but both defects can significantly weaken the structure of dental tissue. The study included a microscopic analysis of a tooth showing signs of erosion caused by the impact of aggressive food products (see Fig.1).



Figure 1 – Study Material

In Figure 1, a microscopic image of dental enamel is presented, demonstrating signs of erosion, particularly significant enamel loss and the presence of cracks. The results of the microscopic analysis showed pronounced enamel loss, accompanied by increased tooth sensitivity. Numerous cracks and irregularities on the tooth surface were also observed, which are typical signs of erosion.

Atrophy, in turn, is manifested by a decrease in tissue volume, which may result from aging or nutrient deficiencies. Figure 2 presents manifestations of atrophy and wear of the tooth, indicating a reduction in functional capabilities and aesthetic shortcomings. In Figure 2, a microscopic image of the tooth is displayed, showing signs of atrophy, such as reduced volume and surface irregularities [3,4].

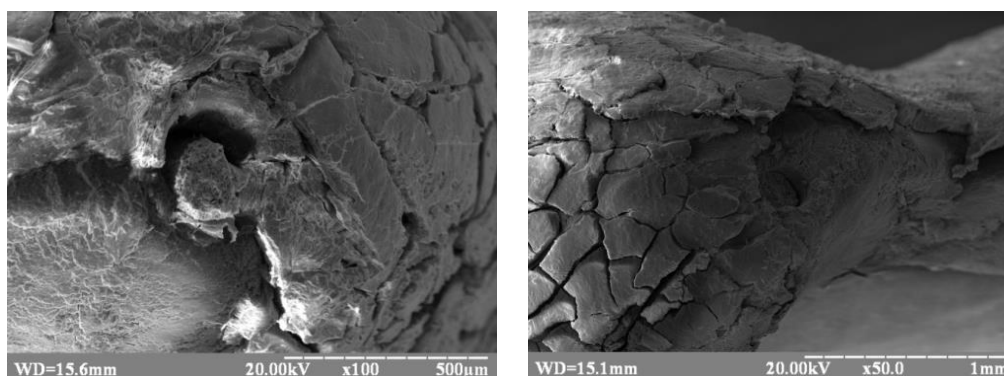


Figure 2 – Microscopic analysis of the biomaterial

To visualize the differences between erosion and atrophy, a table summarizing the main characteristics of these defects can be added (Table 1).

Table 1

Comparison of Erosion and Atrophy in Dental Tissue

<i>Characteristic</i>	<i>Erosion</i>	<i>Atrophy</i>
<i>Definition</i>	Chemical destruction of enamel	Reduction in volume of dental tissue
<i>Causes</i>	Aggressive dietary products (e.g., acidic foods, beverages)	Aging, lack of blood supply, nutrient deficiency
<i>Symptoms</i>	Loss of enamel, increased tooth sensitivity	Decreased tissue volume, surface irregularities
<i>Microscopic Features</i>	Cracks and surface roughness	Thin enamel layer, loss of dentin
<i>Impact on Functionality</i>	Reduced protection, increased sensitivity	Decreased functionality, aesthetic issues
<i>Preventive Measures</i>	Dietary modifications, use of fluoride	Nutritional support, dental care

Table 1 summarizes the main differences between erosion and atrophy of dental tissue, highlighting their causes, manifestations, treatment methods, and preventive measures. This comparison aids both doctors and patients in better understanding the specifics of each condition and selecting the most appropriate preventive and therapeutic interventions [3].

Conclusions. Chemical and physical factors that cause erosion and atrophy are the primary reasons for the deterioration of dental tissue. To prevent these conditions, it is recommended to avoid excessive consumption of aggressive products and to use fluoride toothpaste, which reduces the risk of erosion. Effective treatment methods include fillings, veneers, and crowns, which help restore dental tissue. Regular preventive check-ups with a dentist will facilitate the timely detection and resolution of issues arising from these factors.

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