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GALVANOSIS CLINIC IN THE PRACTICE OF A DENTIST

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ABOUT ARTICLE

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Abstract: It is known that dental materials have a certain effect on the tissues of the oral cavity and the body as a whole. In modern dentistry, metal alloys are one of the main structural materials for the manufacture of artificial crowns, stamped inlays, pins and bridges.

INTRODUCTION

It is known that dental materials have a certain effect on the tissues of the oral cavity and the body as a whole. In modern dentistry, metal alloys are one of the main structural materials for the manufacture of artificial crowns, stamped inlays, pins and bridges.

The purpose of this study is: to summarize knowledge about the etiology, pathogenesis, clinical picture, differential diagnosis, modern treatment and prevention of this disease.

METHODS

The study was based on the search and analysis of original articles on the etiology, clinic, diagnosis, treatment and prevention of oral galvanosis in the databases eLibrary, Pubmed and CrossRef, as well as research in monographs, patents and textbooks. Results: metals in the oral cavity can cause toxic and allergic stomatitis. One of the pathological effects of metals on the tissues of the oral cavity is an electrochemical effect called "galvanosis" [3, 4]. Many authors note that the presence of structures made of dissimilar metals in the oral cavity leads, firstly, to the appearance of burning symptoms in the oral mucosa, and secondly, to a change in taste sensitivity [3-5].According to Borisova E.G. (2018) and Lobanovskaya A.A. As a rule, they make themselves felt for the first time 1-6 months after the first or repeated prosthetics with heterogeneous metal structures (braces, metal tabs, etc.) [6, 7]. To summarize, it should be noted that the clinical picture of oral galvanosis is quite "ambiguous". There are no clear clinical criteria for confidently diagnosing galvanosis. Etiology and pathogenesis. Many authors have drawn attention to the fact that metal structures in the oral cavity are corroded. Galvanic cells based on redox reactions are formed by the interaction of metals with various electrode potentials [1, 8-10]. Danilina T.F. (2011) notes that the phenomena of metal corrosion in modern dentistry are extremely rare, and only when a dental technician makes serious mistakes during casting, for example, too high a metal heating temperature or an incorrect choice of molding mass [1]. These violations lead to metal contamination and acceleration of corrosion processes [11-13]. Studying the corrosion of base alloys, Kaneko T. (2000) and Karov D. and Hinberg I. (2001) found that the effect of heat treatment of crowns, bridges and prostheses directly depends on the action of a corrosive environment in the oral cavity [14, 15]. The problem of metal corrosion in soldered prostheses is local in nature: studies by scanning electron microscopy conducted by Dal Sacco D. et al. (2005) and Sagan N.N. (2006) showed that stainless steel prostheses actively corrode in the soldering zone [16, 17]. As a result, corrosion products (copper, iron, manganese and nickel) enter the oral fluid [1, 2, 8, 18]. Saliva is characterized by its buffering and neutralizing properties [18]. These properties are determined by the buffer capacity of saliva. The buffer tank is a protective mechanism and determines the ability to neutralize acidic and alkaline compounds. The buffering ability of saliva is affected by pH, that is, the concentration of hydrogen ions in saliva, the average value of which is 6.9 [19, 20]; Grechishnikov V. N. (2017) and Borisova E. G. et al. (2018) note that under the influence of metal ions trapped in the oral fluid, the pH decreases [6, 21], which leads to a decrease in the protective properties of saliva [22, 23]. A decrease in the effect of specific and non-specific factors of oral cavity protection under the influence of galbanose was demonstrated in the studies of Borisova E.G. (2018) and Kulak Yu.V. [23-25]. Thus, the main place in the etiology of galvanosis of the oral cavity is occupied by corrosion of metal structures. Firstly, violations in the manufacturing technology of metal structures increase the ingress of metal inclusions

into the oral fluid and provoke corrosion. Secondly, saliva is an electrolyte, and the composition of saliva (a quantitative indicator of trace elements) and pH have a significant effect on electrochemical processes in the oral cavity. Thirdly, it is known that the main causes of corrosion of the oral cavity are some systemic diseases, periodontal diseases and mucosal lesions. Diagnosis of galbanosis of the oral cavity In order to diagnose "galbanosis of the oral cavity", it is necessary to analyze the clinical picture, instrumental and laboratory data; Leonenko P.V. (2003), Danilina T.F. (2012) indicate that the main diagnostic criteria for galbanosis of the oral cavity are: measurement of the magnitude of the potential difference between metal structures in the oral cavity [26, 27]. The clinical picture of galbanosis. Patients suffering from galbanosis complain of a change in taste sensitivity (the appearance of a metallic taste, a feeling of bitterness) and a burning sensation on the mucous membrane of the tongue [28-30] According to Rabinovich O.F. (2005), Yumasheva A.V. (2012) and Vaseneva E.E. (2016), the oral mucosa is normal, i.e. it is pale pink and may be moderately moist, but often its cross section is hyperemic, swollen, and even areas of desquamation of the epithelium may appear in places where metal structures protrude [3, 11, 31, 32]. When examining the oral cavity, many authors studying the intolerance of orthopedic structures assessed the number, type and composition of metal structures, as well as the presence or absence of signs of a violation of manufacturing technology [27, 29, 33]. Laboratory studies 1. Measurement of the potential difference between metal structures and biological tissues in the oral cavity. There are various instruments for measuring the potential difference. In the oral cavity, millivoltmeters, microammeters and potentiometers are used to measure galvanic currents. These devices are used as follows: one electrode is in contact with the bottom of the oral cavity, and the second with the mucous membrane of the oral cavity or another part of the metal structure. Normal voltage (current) values average 30 mV (1-3 μA).2. Measurement of saliva pH. Authors Messer R., Amado F. It is shown that the concentration of hydrogen ions in saliva is measured using an ionometer based on the principle of measuring electromotive force. The pH of saliva can also be measured using a pH meter [2, 18].3. Measurement of saliva mineral composition. To measure the mineral composition of saliva, Amado F. et al. This can be used to determine the content of trace elements in concentrated oral fluid [18, 35, 36]. If the patient suffers from galvanosis, then the potential difference in the oral cavity is 120-150 mV, and the pH shifts to the acidic side. Therefore, various devices are used to measure the galvanic current and potential difference in the oral cavity. At the same time, some authors believe that the absolute value of the galvanic current does not correlate with the intensity of clinical manifestations of galvanosis; in the work of Danilina T.F., Borisova E.G., the etiological treatment of galvanosis in the oral cavity is described, including the replacement of metal structures with metal-free (solid-cast, ceramic, plastic). ceramic, plastic) structures, consisting in replacing them with metal-free (all-ceramic, plastic)

structures [37, 38]. This design has the form of a plastic crown containing a layer of the test material protruding on the surface of the crown and having a fixing element in its thickness, which makes it possible to determine the metal inert to the patient for future designs.

CONCLUSION

Thus, the problems of diagnosis, treatment and prevention of galbanosis of the oral cavity are very complex. Given the high frequency of its occurrence, it is necessary to develop methods for the prevention of this condition and be able to determine the patient's predisposition to galbanosis at the planning stage of orthopedic treatment.

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