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# The Effect of Removable Dentures on The Oral Mucosa of The Prosthetic Area

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Removable prostheses have a combined mechanical, chemotoxic, sensitizing and thermally insulating irritating effect on the mucous membrane of the prosthesis base and its neuroreceptive organs, the intensity and nature of which depend on the physico-chemical properties of the prosthesis base, design features, manufacturing quality and duration of use of the prosthesis [4]. Prosthetic stomatitis is manifested by burning, tingling, dryness and pain in the area of the supporting tissues of the base of the prosthesis, sometimes on the tip and underside of the tongue, lips and cheeks and can make it impossible to use prostheses for some patients [1]. Dental stomatitis is especially common in women over 50 years of age and is caused by a decrease in the protective barrier function of the epithelium of the hard palate, less often occurs on the alveolar process of the upper jaw and very rarely - on the alveolar process of the lower jaw. At the same time, the localization, intensity and location of inflammatory phenomena in the same patient may be different. Recent studies have shown that the problem of the relationship between the prosthesis and the basis of the prosthesis has not lost its relevance in modern conditions. Clinically localized inflammation of the SOPR when using removable prostheses manifests itself in the form of single or multiple point hyperemias, sometimes in the form of large plaques, uneven in size and localization. In more advanced stages, hemorrhagic erosions, decubitus ulcers, painful hyperplastic hyperplasia appear against the background of loosening and swelling of the mucous membrane. Superficial inflammation is often localized in the area of glandular nodules, lobules, transitional folds and the alveolar ridge. Desmoplastic ulcers are located mainly in the area of transitional folds and along the "A" line, less often on the alveolar ridge and the hard palate. Papillomatous growths are often localized in the central part of the hard palate [1]. Diffuse inflammation is characterized by the same clinical manifestations, but locally and anatomically occupies the entire surface of the base of the prosthesis, coincides with the border of the base of the prosthesis, has a cherry-red color and is accompanied by swelling and loosening. Inflammation of the nozzles without violation of the integrity of the epithelium is observed, as a rule, in the period from 1 to 3 years in patients with removable prostheses. In such cases, erosion and hyperplasia occur more than three years later when the basic surface and the basis of the prosthesis do not match [4]. The causes of local inflammation of the NOZZLES are poor fixation and balancing of the prosthesis, roughness, porosity, shrinkage of plastic during polymerization and a decrease of 0.02-0.5%. The etiology of diffuse inflammation of the nozzles is chemotoxic or allergic [4], as noted by Vasilenko Z.S. (1955) [4]. As Z.S. Vasilenko (1955) notes, technical measures to improve the quality of polymerization of acrylic plastics and reduce the amount of residual monomer in the prosthesis are ineffective in patients with diffuse chemotoxic inflammation of the supporting tissues of the prosthesis base [1]. There is a point of view that completely excludes mechanical factors and indicates that even in well-made prostheses, inflammatory changes may occur due solely to the general state of the body [3,18]. Poor hygiene, contamination of the surface of acrylic plastic prostheses with microorganisms and products of their vital activity, a decrease in local immunity can

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contribute to the development of inflammatory phenomena in POPL. Such an environment creates a specific focus of infection with toxins and can be the cause of local and systemic pathological changes in the patient's organs. P.T. Tanrykuliyev (1988) believes that the main cause of prosthetic stomatitis is the adsorption of food particles, medicinal substances, oral microflora and their toxins on the surface of acrylate prostheses, as a result of which prostheses eventually acquire antigenic properties and require modification. According to many authors, one of the main reasons for the intolerance of the base material, irritation and inflammation of the nozzles is the residual monomer methyl methacrylate, which is present in plastics at a concentration of 0.2-5.2% even with prolonged polymerization and persists in prostheses for up to 12 months. Other components that make up the base plastic are relatively harmless and are considered unlikely to cause allergic reactions due to their low concentration (for example, hydroquinone - 0.01%, benzoyl peroxide - 0.2-0.5%), and the dye is considered biologically indifferent, since it does not easily dissolve In such situations, the clinical picture corresponds to a non-specific inflammation of contact chemotoxicity, manifested in the form of hyperemia, speckled bleeding, edema, dryness and burning, dysesthesia of the mucous membrane of the oral cavity and tongue. In rare cases, intolerance to the main material can manifest itself in the form of eczema, glossitis, swelling of the lips, acute dermatitis of the face and hands, bronchial asthma and other allergic manifestations. It should be noted that one of the causes of inflammation of the mucous membrane of the prosthetic fundus is negative pressure on the basis of the prosthetic structure, which can be damaging [4]. There are atrophic and thickened prosthetic stomatitis. In the atrophic form, atrophy of the mucous membrane and erythema of most supporting tissues are observed. Pathomorphologically, the surface of the mucous membrane is covered with a multi-layered squamous epithelium with a thin spiny layer and a certain number of spinulations. A lymphohistiocytic infiltrate is present in the connective tissue base. Occasionally, macrophage cells are found in the thickness of the epithelium. In hyperplastic stomatitis of the mucous membrane, in addition to signs of generative inflammation, pronounced erythematous changes are observed, the foci of which are mainly localized in the center of the hard palate and at the top of the alveolar ridge of L.M. Perzashkevich et al. (1984), using smears taken from the surface of removable dentures made of acrylic plastic, microbiological studies showed that yeast-like fungi of the genus Candida were isolated from all patients and that their number gradually increased in direct dependence on the duration of use of the prostheses [28]. Currently, a large amount of data has been accumulated and a sufficient number of publications have been published on the morphofunctional characteristics, histochemical and ultrastructural studies of SOPR. However, there is no consensus on many issues concerning the reaction of supporting tissues to the impact of orthopedic structures and prosthetic materials, and further research is needed on many aspects of this problem. The reaction of the SOPR to the impact of removable orthopedic structures made of acrylic plastic manifests itself in the form of various morphological changes, which in 67.5% of cases are reactive and adaptive, and in 32.5% - pathological [7]. Under the influence of removable plate prostheses, thickening of the epithelial layer and thinning of the inner layer of the mucous membrane occurs within 2-8 years. The cells of the basal layer become hypoplasmic. The granular and horny layers gradually thin out and disappear. There is a pronounced proliferation of spiny cells. Epithelial growths are very diverse in shape and size. Lymphocytes are found in the epithelium. In connective tissue, the number of fibroblastic elements increases, but stromal material prevails over cells. The number of infiltrates from plasma cells and histiocytes with their accumulation around blood vessels increases. As the prosthesis is used

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for a long time (5-8 years), local infiltration by lymphocytes and plasma cells increases and is detected not only along the vessels, but also in other parts of the connective layer. Elastic fibers in connective tissue and blood vessels of the POPL become thicker and coarser, and some lose their continuity. In muscle-type vessels, the internal elastic membrane increases. The number of elastic elements decreases in the inner shell of the vessel and increases in the outer one. Fragmentation, mucosal swelling, hyaline deposition, sclerosis and fibrinoid dystrophy occur in the collagen fibers of connective tissue [4,7,29, etc.] Morphological changes in the mucous membrane of the base of the prosthesis have been increasing for more than 10 years of using removable prostheses and are characterized by various combinations of atrophic and hyperplastic processes. The epithelial layer thickens unevenly, the horny and granular layers disappear. In the cells of the surface layers, pronounced dystrophic changes (dyskeratosis, parakeratosis) are observed, often leading to rejection. In such cases, the epithelium of the prosthesis base turns into a loose narrow strip of basal and spiny cells infiltrated by lymphocytes. In some cases, there is exposure of connective tissue papillae, their enlargement and papillary edema; a picture of chronic inflammation is observed in all areas of POPL. The size of the spiculocytes increases, the intercellular spaces decrease. Epithelial growths become larger and more diverse in shape. Epithelial pearls of varying degrees of maturity are present in the spicular layer. Connective tissue is infiltrated by plasma cells and histiocytes. The number of collagen fibers in the connective tissue base increases with prolonged use of the prosthesis, they become thinner, more fragmented, often hyaline, and their bundles are located randomly even in the papillae of their own layer. Elastic fibers are usually thickened and fragmented. Elasticity is observed in muscle-type vessels. Elastic fibers are less numerous in the mesial membrane of vessels and more numerous in the outer membrane; microscopic studies of M.A. Ribrovoy (1968) the states of the nerve elements of the mucous membrane of the hard palate and the alveolar process under a removable plate prosthesis showed pronounced destructive changes. In the submucosal and subepithelial connective tissue, many nerve fibers were in a state of massive and granular disintegration. These processes were especially pronounced in myelin nerve fibers. Nerve fibers without myelin sheaths unfolded and thickened, as a result of which fullness, vacuoles, varicose thickenings and deposits of nervous plasma formed throughout them. In the epithelial layer, the number of nerve endings in the form of tubes, bushes and processes increased. Receptor structures were found mainly in connective tissue papillae. Most of the nerve endings were in a state of destruction, but penetrated all layers and reached the surface layers of the epithelium. This situation caused an increased sensitivity of the mucous membrane of the base of the prosthesis, a burning sensation and dryness in the oral cavity [29]. Research by N.S. Ivanova (1972) reactions of the small salivary glands of the SOPR to the impact of removable prostheses showed an increase in the atrophic process and the presence of chronic inflammation, destruction of several lobules and fat replacement by tissue, granulation and connective tissue, a decrease in secretory activity and viscosity of the secretion was noted. The lumen of the terminal part of the palatine gland is expanded, the height of secretory cells in some areas is reduced. In some excretory ducts, stagnation of secretions was observed, the lumen of which was filled with thick, exfoliated mucous secretions, exfoliated degenerated epithelial cells and lymphocytes. The walls of the arteries were sharply thickened. A significant growth of connective tissue with coarsening of collagen fibers was observed around the vessels and excretory ducts. Local and diffuse inflammatory infiltrates were present in the deep and superficial layers of the glands of the hard palate and around their ducts and were observed with an increase in the duration of use of

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the prosthesis. Inflammatory infiltrate was more common in the posterior third of the hard palate than in its middle part, and had a wider area of distribution. The inflammatory infiltrate migrated directly from the subepithelial connective tissue into the gland and spread through the ducts only when the infiltrate worsened in its own layer. Inflammation of the gland is caused by stagnation of the secretion. Extensive infiltrated areas of the gland were replaced by connective tissue and fat cells. The gland cells in many terminal sections gradually atrophied and acquired an endothelioid appearance. The cell nuclei increased in volume and were unevenly or weakly stained with nuclear dyes. The basement membrane thickened and hyalinized. Connective tissue grew around the terminal sections. When the secretion stagnates, the excretory ducts expand cystically, their walls become thinner, and the height of epithelial cells sometimes decreases. Rapid cell detachment inside the excretory ducts and, in some cases, local epithelial proliferation were often observed [14]. Morphohistochemical studies of the diaphragm mucosa of patients who used plastic floating diaphragms for several years revealed a direct relationship between the duration of wearing orthopedic devices and their effect on changes in the epithelium and connective tissue of the mucous membrane. As this period increased, the thickness of the granular layer decreased and the stratum corneum gradually disappeared. SHIK-positive material was observed in the granular and horny layers. Perivascular infiltrates were located along the entire thickness of the mucous membrane and more widely in the subepithelial layer. Local infiltrates were found in the area of the glands of the soft and hard palate. Minimal perivascular infiltration by polymorphonuclear cells, histiocytes and plasma cells developed during the orthosis period up to 3-4 years, then local and diffuse infiltration with a predominance of hematogenic element appeared. Prolonged wearing of the prosthesis increased the content of mast cells lying in small populations in loose connective tissue along the vessels. The most pronounced inflammatory changes were observed in children with poor oral hygiene. Changes in the fibrous structure of the mucous membrane were observed. The bundles of collagen fibers became thicker and more sinuous. Elastic fibers acquired uneven contours and often branched. Acidic mucopolysaccharides, such as chondritin sulfate, accumulated in the intercellular substance of connective tissue, vascular walls, basement membranes and mucous glands. Hyaluronic acid was found in inflammatory foci of the nasal mucosa and along the edges of lacunae. Destructive changes of nerve trunks, fibers and anterior terminals were observed, mostly from the nasal mucosa and soft palate. Analyzing the cause of these changes, the authors associate them with the presence of chronic inflammation of the nasopharynx in this category of patients [10]. There is desquamation of the epithelium, an increase in the number of cells in the middle and deep layers of the spiny layer, an increase in the number of microorganisms (mainly staphylococci and streptococci) and polymorphonuclear leukocytes. Structural changes of epithelial cells are observed: cytoplasmic vacuolization, pyogenization, cell lysis, "naked nuclei", division and binucleation [7]. Cytological studies of prints from the mucous membrane of the base of the prosthesis have shown that with prolonged use of removable prostheses made of polymethylmethacrylate, the development of prosthetic stomatitis is manifested by a significant increase in the index of inflammatory decay. The increase in the destruction index (ID) and the inflammatory-destructive index was especially pronounced in patients with inflammatory-erosive processes in the mucous membrane of the prosthesis base. The frequency distribution of the values of the inflammatory-destructive index in patients with complaints of discomfort when using prostheses made of polymethylmethacrylate (mobility of the prosthesis during chewing, itching, burning and painful sensations in the area of the base of the prosthesis) was characterized by the fact that the frequency

of normal values of the inflammatory-destructive index was higher. (91.8% for externally intact oral mucosa, 29% for "traumatic" stomatitis and 34% for contact allergic stomatitis. In general, in traumatic and allergic stomatitis, in about 70% of cases, the values of the inflammatory destruction index exceeded the reference values [36]. Microbiological studies have shown that more pathological bacterial microflora was present on the surface of the roots of acrylic plastic prostheses than in the postoperative cavity.

**Conclusion:** Analyzing the literature data, it can be concluded that a number of studies have shown the existence of pathological changes under the influence of removable prostheses. It was found that it depends on the quality of the prosthesis, the conditions of its use, oral hygiene and the reactivity of the patient's body. Removable dentures are a complex irritant with mechanical and chemical toxicity, sensitizing and heat-insulating properties, leading to inflammation and subsequent atrophy. The behavior of body tissues under the influence of external stresses and deformations obeys the law of delay [8].

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