

**HISTOLOGICAL CHANGES IN THE ORAL MUCOSA WHEN USING ACRYLIC
REMOVABLE DENTURES**

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Annotation. The problem of morphofunctional changes in the oral mucosa in the orthopedic treatment of patients with removable acrylic prostheses remains highly relevant due to the widespread use of polymethylmethacrylate (PMMA) base materials. Despite satisfactory clinical characteristics, acrylic prostheses can cause a complex of reactive, inflammatory and dystrophic changes in the integumentary epithelium and underlying connective tissue. The aim of the study was to analyze the histological changes in the oral mucosa in patients using acrylic removable dentures and to determine the nature of morphological changes depending on their service life. Morphological examination of biopsies of the mucous membrane of the prosthetic bed was performed in 42 patients with partial and complete adentia using acrylic removable dentures for a period of 6 months to 5 years. The material was fixed in 10% neutral formalin, standard paraffin wiring, hematoxylin and eosin staining, and Van Gieson picrofuxin were performed. The condition of the multilayer squamous epithelium, the basement membrane, the vascular bed, and the cellular composition of the intrinsic lamina of the mucous membrane were evaluated. Characteristic morphological changes were revealed: hyperkeratosis and parakeratosis, acanthosis, areas of epithelial atrophy, vacuolization of the cells of the thorny layer, thickening and fragmentation of the basement membrane, chronic lymphoplasmocytic infiltration of its own plate, phenomena of sclerosis and vascular disorders. The intensity of the changes correlated with the duration of wearing the prosthesis and the quality of hygienic care. The use of acrylic prostheses is accompanied by the development of adaptive-compensatory and pathological morphological rearrangements of the oral mucosa. The data obtained confirm the need for morphological monitoring of the condition of the prosthetic bed and the improvement of materials for the basis of removable structures.

Keywords: oral mucosa, acrylic prostheses, histology, polymethylmethacrylate, prosthetic stomatitis, hyperkeratosis, inflammatory infiltration.

Introduction. Removable plate prostheses made of acrylic plastics based on polymethylmethacrylate (PMMA) continue to be widely used in orthopedic dentistry in the treatment of partial and complete adentia. Their accessibility, technological simplicity of manufacture and satisfactory operational characteristics determine their significant prevalence in clinical practice.

However, prolonged exposure of the acrylic base to the mucous membrane of the prosthetic bed may be accompanied by the development of morphological changes of varying severity. These changes are caused by a complex of factors: mechanical compression of tissues, microtraumatization, impaired microcirculation, changes in the microbiocenosis of the oral cavity, as well as the possible influence of the residual methyl methacrylate monomer and degradation products of the material.

The oral mucosa is a highly specialized tissue capable of active regeneration and adaptation. Under conditions of constant stress, it undergoes structural restructuring aimed at maintaining barrier and trophic functions. However, with prolonged or excessive exposure, adaptive reactions turn into pathological ones.

Despite the presence of clinical observations of prosthetic stomatitis, hyperplastic and atrophic processes, data on the detailed histological characteristics of the mucous membrane when using acrylic prostheses remain fragmentary and require systematization.

The purpose of this study was to study the histological changes in the oral mucosa in patients using acrylic removable dentures.

Materials and methods.

The study was performed on the basis of the clinical and morphological departments of the dental profile. The study included 42 patients aged 45 to 78 years with partial and complete adentia using acrylic removable dentures.

The patients were divided into three groups depending on the duration of use of the prostheses.:

- Group I — up to 1 year (n = 14),
- Group II — from 1 to 3 years (n = 15),
- Group III — more than 3 years (n = 13).

The study material was biopsies of the mucous membrane of the prosthetic bed (the area of the hard palate or alveolar process). The material was collected in the presence of clinical indications (hyperemia, hyperplasia, areas of atrophy).

Biopsies were fixed in a 10% neutral formalin solution for 24 hours, after which standard histological wiring was performed with paraffin filling. Sections 4-5 microns thick were stained with hematoxylin and eosin for general morphological assessment, as well as by Van Gieson to identify collagen fibers.

Microscopic examination was performed using a light microscope at magnifications $\times 100$, $\times 200$ and $\times 400$. Evaluated:

- thickness of the epithelial layer,
- severity of keratinization,
- state of intercellular contacts,
- integrity of the basement membrane,
- the nature of inflammatory infiltration,
- vascular changes,
- the degree of fibrosis of its own plate.

The morphometric assessment was performed using a semi-quantitative method using a point scale (0-3).

The results of the study.

Changes in the epithelial layer.

Moderate adaptive changes were noted in the first group of patients. Focal hyperkeratosis, mainly of the orthokeratotic type, thickening of the thorny layer (acanthosis), and slight vacuolization of cells were detected.

In group II, there was an increase in keratinization processes with areas of parakeratosis. In some cases, uneven epithelial thickness was observed with alternating zones of hyperplasia and atrophy. The basement membrane became thickened and fragmented in places.

In the third group of patients, signs of chronic damage prevailed: pronounced epithelial atrophy, thinning of the granular layer, disorganization of intercellular contacts, and focal desquamation. In individual preparations There were signs of mild dysplastic changes (stratification disorder, nuclear polymorphism without signs of invasion).

Changes in the own plate of the mucous membrane.

Moderate lymphocytic infiltration of a perivascular nature was detected in the early stages of wearing prostheses.

In group II, severe chronic lymphoplasmocytic infiltration with an admixture of macrophages was formed. There were signs of venous congestion, capillary dilation, and plasmorrhagia.

Fibrosis phenomena were observed in group III: thickening of collagen fibers, reduction of cellular elements, sclerosis of the stroma. The number of vessels decreased, and their walls thickened due to hyalinosis.

Vascular changes.

In all groups, signs of microcirculatory disorders were detected, the severity of which increased with the service life of the prosthesis. Venule enlargement, erythrocyte stasis, and endothelial dysfunction were noted.

The results obtained indicate that the oral mucosa undergoes a consistent morphological restructuring when using acrylic prostheses.

In the early stages, adaptive processes prevail — hyperkeratosis and acanthosis, aimed at strengthening the barrier function. These changes can be considered as a compensatory reaction to mechanical stress.

As the duration of wearing the prosthesis increases, adaptive reactions are replaced by chronic inflammation and dystrophic processes. Probably, the combined effect of mechanical pressure, microbial factor and chemical irritation by residual monomer plays a key role.

Fibrosis of the lamina and vascular disorders lead to deterioration of tissue trophism, which, in turn, supports the chronic inflammatory process and contributes to the development of atrophic changes.

Special attention should be paid to the identified signs of mild epithelial dysplasia in the group of long-term use of prostheses. Although these changes were not malignant, they confirm the need for dynamic follow-up of patients with long-term prosthetics with acrylic structures.

Thus, the revealed histological changes reflect the transition from adaptation to chronic tissue damage during prolonged exposure to the acrylic base.

Conclusions:

1. The use of acrylic removable dentures is accompanied by the development of adaptive and compensatory changes in the oral mucosa in the form of hyperkeratosis and acanthosis.

2. With an increase in the service life of the prosthesis, a chronic inflammatory process with lymphoplasmocytic infiltration and microcirculation disorders is formed.

3. Prolonged use of acrylic prostheses leads to atrophic and sclerotic changes in the own plate of the mucous membrane.

4. The data obtained substantiate the need for regular clinical and morphological monitoring of the condition of the prosthetic bed and the development of materials with improved bioinert properties.

The prospects for further research are related to the study of immunohistochemical markers of proliferation, apoptosis, and angiogenesis in prosthetic bed tissues with various types of base materials.

REFERENCES:

1. Kuzieva, M., Akhmedova, M., & Khalilova, L. (2025). MODERN ASPECTS OF CHOICE OF MATERIAL FOR ORTHOPEDIC TREATMENT OF PATIENTS IN NEED OF DENTAL PROSTHETICS. *Modern Science and Research*, 4(1), 322-333.

2. Kuzieva, M., Akhmedova, M., & Khalilova, L. (2025). GALVANOSIS AND ITS DIAGNOSTIC METHODS IN THE CLINIC OF ORTHOPEDIC DENTISTRY. *Modern Science and Research*, 4(2), 203-212.

3. Kuzieva, M. A. (2023). Clinical and Morphological Criteria of Oral Cavity Organs in the Use of Fixed Orthopedic Structures. *Research Journal of Trauma and Disability Studies*, 2(12), 318-324. 458 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 3
4. Abdusalimovna, K. M. (2024). THE USE OF CERAMIC MATERIALS IN ORTHOPEDIC DENTISTRY. (Literature review). *TADQIQOTLAR*, 31(3), 75-85.
5. Abdusalimovna, K. M. (2024). CLINICAL AND MORPHOLOGICAL FEATURES OF THE USE OF METAL-FREE CERAMIC STRUCTURES. *TA'LIM VA INNOVATSION TADQIQOTLAR*, 13, 45-48.
5. Abdusalimovna, K. M. (2024). THE ADVANTAGE OF USING ALL-CERAMIC STRUCTURES. *TA'LIM VA INNOVATSION TADQIQOTLAR*, 13, 49-53. 1286 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 6
6. Abdusalimovna, K. M. (2024). Clinical and Morphological Features of the Use of Non Removable Orthopedic Structures. *JOURNAL OF HEALTHCARE AND LIFE SCIENCE RESEARCH*, 3(5), 73-78. 800 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 4 1285 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 5
7. Kuzieva, M. A. (2024). CARIOUS INFLAMMATION IN ADOLESCENTS: CAUSES, FEATURES AND PREVENTION. *European Journal of Modern Medicine and Practice*, 4(11), 564-570.
8. ISSN NUMBER:2751-4390 IMPACT FACTOR:9,08 Kuzieva, M. A. (2024). Malocclusion–Modern Views, Types and Treatment. *American Journal of Bioscience and Clinical Integrity*, 1(10), 103-109.
9. KUZIEVA, M. A. (2024). MODERN ASPECTS OF MORPHO-FUNCTIONAL DATA AND TREATMENT OF AGE-RELATED CHANGES IN THE MAXILLOFACIAL REGION. *Valeology: International Journal of Medical Anthropology and Bioethics*, 2(09), 126-131.