

**MORPHOFUNCTIONAL CHANGES IN THE ORAL MUCOSA IN PATIENTS
WEARING REMOVABLE DENTURES: FREQUENCY OF COMPLICATIONS AND
CLINICAL FEATURES OF MICROCIRCULATION**

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Abstract

Removable prosthetic treatment remains one of the most widely used methods of oral rehabilitation in patients with partial and complete edentulism. Despite the development of implant dentistry, removable dentures continue to be extensively used in routine clinical practice, particularly in older patients and in individuals with medical or anatomical contraindications to implant placement. Long-term use of removable prostheses exposes the denture-bearing mucosa to constant mechanical loading and may lead to inflammatory, traumatic, and atrophic changes.

The aim of this study was to evaluate the frequency and structure of morphofunctional changes in the oral mucosa in patients wearing removable dentures and to assess clinical features of microcirculation depending on denture design.

The study was carried out at the Bukhara Regional Dental Polyclinic and included 51 patients aged 45–75 years who had been wearing removable dentures for at least 6 months. Clinical examination of the oral mucosa was performed to identify denture stomatitis, traumatic lesions, and mucosal atrophy. In addition, the condition of microcirculation in denture-bearing tissues was clinically assessed according to prosthetic design.

Pathological changes of the oral mucosa were identified in 22 of 51 patients (43.1%). Denture stomatitis was the most frequent complication and was diagnosed in 12 patients (23.5%). Traumatic lesions were found in 8 patients (15.7%), while mucosal atrophy was observed in 2 patients (3.9%). No cases of mucosal hyperplasia or candidiasis were detected. Acrylic dentures were associated with the most unfavorable clinical signs of impaired microcirculation, clasp dentures with the most stable tissue condition, and nylon dentures with intermediate findings.

The results indicate that morphofunctional changes of the oral mucosa in removable denture wearers are common and, in this cohort, appear to be largely associated with chronic mechanical impact on denture-bearing tissues. Denture design influenced both the clinical condition of the mucosa and the pattern of microcirculatory changes.

Introduction

Partial and complete edentulism remain major clinical problems in contemporary prosthodontics. Tooth loss affects not only the integrity of the dentition, but also chewing efficiency, speech, facial appearance, and overall quality of life. In addition, edentulism is accompanied by progressive structural and functional changes in the stomatognathic system, including remodeling of denture-bearing tissues. For this reason, prosthetic rehabilitation remains a necessary component of comprehensive dental care.

Although implant dentistry has significantly expanded treatment possibilities, removable prosthetic treatment continues to occupy an important place in clinical practice. This is explained by several factors, including severe alveolar ridge resorption, systemic contraindications to surgery, age-related medical limitations, and the relatively wider availability of removable prosthetic options. As a result, removable dentures remain highly relevant for both partial and complete edentulism.



In removable prosthetics, the oral mucosa serves as the principal supporting tissue for functional load transfer. Unlike the physiological loading pattern in a natural dentition, denture-bearing mucosa is exposed to prolonged pressure from the denture base, friction, shear forces, and micromobility of the prosthesis. At the same time, the local environment changes because of altered aeration, reduced self-cleansing, and increased plaque retention on the denture surface. Under these conditions, both adaptive and pathological tissue responses may develop.

A particularly important aspect of this process is the condition of microcirculation. Persistent mechanical compression of the mucosa may impair local blood flow, reduce oxygen supply, disturb trophic support, and weaken tissue regenerative capacity. These changes may create favorable conditions for inflammatory, traumatic, and atrophic lesions of the oral mucosa. From a pathogenetic perspective, microcirculatory disturbances can therefore be regarded as one of the key mechanisms underlying denture-related mucosal pathology.

Denture stomatitis is commonly described in the literature as the most frequent complication of removable prosthetic treatment. However, its pathogenesis is complex and cannot be attributed to a single factor. Mechanical trauma, prosthetic design, material properties, hygiene status, microbial colonization, and tissue reactivity may all contribute to the development of mucosal pathology. At the same time, the relationship between different denture designs and the clinical condition of denture-bearing tissues remains insufficiently clarified in everyday clinical settings.

The aim of the present study was to evaluate the frequency and structure of morphofunctional changes in the oral mucosa in patients wearing removable dentures and to assess clinical features of microcirculation depending on denture design.

Materials and Methods

This observational clinical study was conducted at the Bukhara Regional Dental Polyclinic. A total of 51 patients aged 45–75 years were included. All participants had partial or complete edentulism and had been using removable dentures for at least 6 months.

Inclusion criteria

Patients were included if they met the following criteria:

- age between 45 and 75 years;
- use of a removable denture for at least 6 months;
- presence of partial or complete edentulism;
- absence of acute inflammatory oral diseases at the time of examination.

This approach made it possible to evaluate relatively stable mucosal changes rather than short-term early adaptation reactions after denture delivery.

Clinical examination

All patients underwent clinical examination of the oral mucosa after denture removal. The denture-bearing tissues were assessed with attention to mucosal color, hyperemia, local tenderness, chronic irritation, and visible structural changes.

The following pathological conditions were recorded:

- denture stomatitis;
- traumatic mucosal lesions;
- mucosal atrophy.

Denture stomatitis was diagnosed when inflammatory changes were observed within the area covered by the denture. Traumatic lesions were recorded when chronic mechanical injury was clinically evident and associated with redness, soreness, or disruption of epithelial integrity. Mucosal atrophy was documented when thinning of the mucosa and reduced resistance of the tissues to functional loading were observed.

Clinical assessment of microcirculation



Microcirculation in denture-bearing tissues was assessed clinically and qualitatively. The assessment was based on the overall appearance of the mucosa, the degree of trophic preservation, the presence of congestive changes, and the general tolerance of tissues to prolonged denture loading. Particular attention was paid to differences associated with the type of prosthetic construction, especially acrylic, nylon, and clasp dentures.

Statistical analysis

Statistical analysis included calculation of absolute values and relative frequencies expressed as percentages. The results are presented as n (%).

Results

Pathological changes of the oral mucosa were identified in 22 of 51 patients, corresponding to 43.1% of the examined cohort. Thus, nearly one in two removable denture wearers demonstrated clinically relevant morphofunctional alterations in denture-bearing tissues.

Denture stomatitis was the most common complication and was diagnosed in 12 patients (23.5%). Traumatic lesions of the oral mucosa were detected in 8 patients (15.7%). Mucosal atrophy was observed in 2 patients (3.9%). No cases of mucosal hyperplasia or candidiasis were identified in the study group.

Table 1. Frequency of oral mucosal complications in removable denture wearers

Complication	n	%
Denture stomatitis	12	23.5
Traumatic lesions	8	15.7
Mucosal atrophy	2	3.9
Mucosal hyperplasia	0	0
Candidiasis	0	0

The distribution of findings showed that inflammatory and traumatic lesions clearly predominated in the structure of denture-related mucosal pathology, while atrophic changes were less frequent.

Clinical evaluation of microcirculation demonstrated that tissue status differed depending on denture design. The most unfavorable clinical signs of impaired microcirculation were observed in patients wearing acrylic dentures. These patients showed less favorable mucosal appearance and more frequent signs of chronic irritation. Patients with clasp dentures demonstrated the most stable tissue condition, suggesting a more favorable interaction between the prosthesis and the denture-bearing mucosa. Nylon dentures showed intermediate characteristics.

Table 2. Clinical characteristics of denture-bearing tissue microcirculation according to denture design

Denture type	Microcirculatory status	Clinical tissue condition
Acrylic denture	Most pronounced reduction	Least favorable mucosal condition; more frequent signs of chronic irritation
Nylon denture	Intermediate changes	Moderately expressed tissue response
Clasp denture	Most stable findings	Most favorable condition of denture-bearing tissues

Overall, the results suggest that the severity of morphofunctional mucosal changes is related not only to the duration of denture use, but also to prosthetic design.

Discussion



The present study showed that morphofunctional changes of the oral mucosa are common in patients wearing removable dentures. The overall frequency of pathological findings reached 43.1%, which confirms the clinical relevance of denture-related tissue reactions and indicates that denture tolerance remains an important issue in prosthodontic practice. Even when severe lesions are absent, denture-bearing tissues may function under conditions of chronic overload and reduced biological adaptability.

Denture stomatitis was the most frequent complication in this cohort. This finding is in line with the established literature, where inflammatory mucosal changes are consistently regarded as the most common adverse reaction in removable denture wearers. At the same time, the rate observed in the present study should be interpreted in the context of the specific clinical sample and the diagnostic criteria used.

An important feature of our findings is the absence of clinically diagnosed candidiasis. This suggests that, within this group of patients, chronic mechanical irritation may have played a more prominent role than overt fungal infection. Such an interpretation should be made with caution, since subclinical colonization cannot be excluded in the absence of microbiological testing. Nevertheless, the results support the concept that denture-related mucosal inflammation may arise primarily from local biomechanical and trophic disturbances, even without clinically evident infectious involvement.

Traumatic lesions ranked second among the detected complications. Their presence further underlines the role of local mechanical factors such as excessive pressure, imperfect adaptation of the denture base, uneven load distribution, and micromobility of the prosthesis. From a practical point of view, this means that successful removable prosthetic treatment depends not only on denture fabrication itself, but also on precise adjustment, post-insertion correction, and systematic clinical follow-up.

Mucosal atrophy was less frequent, yet it remains clinically meaningful. Even isolated cases of atrophy may reflect deeper trophic insufficiency and diminished adaptive reserve of denture-bearing tissues. In such patients, long-term prosthetic tolerance may be compromised, and future rehabilitation may become more difficult.

The clinical evaluation of microcirculation adds important interpretive value to the study. Acrylic dentures were associated with the most unfavorable tissue pattern. This appears clinically plausible because acrylic bases often cover a larger mucosal area and may produce more prolonged and concentrated pressure on denture-bearing tissues. Such conditions are likely to contribute to vascular compression, reduced trophic support, and increased vulnerability of the mucosa to chronic irritation.

By contrast, clasp dentures demonstrated the most favorable clinical picture. Their biomechanical advantages likely include more rational distribution of functional load and less extensive direct coverage of the mucosa. This may help preserve better microcirculatory conditions and improve tissue tolerance. Nylon dentures showed intermediate findings, which seems reasonable given their elastic properties and their distinct mode of load transmission.

Several limitations of the present study should be acknowledged. First, microcirculation was assessed clinically rather than instrumentally. Second, candidiasis was excluded on clinical grounds only, without microbiological confirmation. Third, the sample size was relatively modest. However, these limitations do not diminish the practical value of the study, because the findings reflect routine clinical conditions and highlight patterns that are directly relevant to prosthodontic decision-making.

Taken together, the results indicate that morphofunctional changes of the oral mucosa in removable denture wearers are shaped by a combination of factors, among which chronic mechanical impact and prosthetic design appear to play a leading role in this cohort. This



supports the need for a more individualized approach to removable prosthetic treatment, especially in patients with fragile, poorly resilient, or trophically compromised denture-bearing tissues.

Conclusion

Morphofunctional changes of the oral mucosa were detected in 43.1% of the patients wearing removable dentures in this study. Denture stomatitis was the most frequent complication, followed by traumatic lesions and, less commonly, mucosal atrophy. Clinical signs of impaired microcirculation varied according to denture design: acrylic dentures showed the least favorable tissue condition, while clasp dentures demonstrated the most stable findings. These results indicate that prosthetic design should be considered an important determinant of mucosal tolerance and should be taken into account when planning removable prosthetic treatment and long-term follow-up.

Conflict of Interest

The author declares no conflict of interest.

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