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OPTIMIZATION OF HYGIENIC CARE IN PATIENTS WITH REMOVABLE DENTAL PROSTHESIS

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Abstract
This article presents an overview of current concepts regarding hygiene care for patients wearing removable dentures. The main problems that arise from poor hygiene practices are discussed, including microbial colonization, the development of denture stomatitis, and angular stomatitis. Cheilitis and halitosis . Particular attention is paid to the analysis of modern treatment methods and products—mechanical, chemical, and combined—as well as an assessment of their effectiveness in preventing inflammatory complications.
It has been shown that optimizing hygiene care requires a comprehensive approach, including regular cleaning of dentures, disinfection with special solutions, the use of ultrasonic technologies, and patient education on personal hygiene. The use of modern enzymatic and oxygen-based cleansers helps break down biofilms and extend the lifespan of orthopedic structures.
The results of the review confirm that systematic adherence to hygiene measures significantly reduces the incidence of inflammatory processes in the oral cavity and improves the quality of life of patients using removable dentures.

Keywords: Removable dentures; hygienic care; denture stomatitis; angular cheilitis; biofilm; disinfection; prevention of complications; care of dentures.

Introduction

Removable dentures occupy a leading position in orthopedic dentistry and remain the most common method for restoring chewing function in patients with partial or complete tooth loss. This is especially relevant for the elderly, who have limited options for implantation due to somatic diseases, anatomical features, or financial reasons [1.2.4].

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However, the effectiveness of prosthetics depends largely not only on the quality of the prosthesis's manufacture but also on the patient's adherence to hygiene care. Failure to adhere to basic hygiene requirements leads to the rapid accumulation of plaque, the development of inflammatory reactions in the mucous membrane, and a reduced service life of the orthopedic device.

According to several studies, 60–80% of removable denture wearers experience inflammatory changes in the denture-bearing mucosa within the first few months of wearing them. The most common complication is denture stomatitis , caused by microbial or fungal colonization of the denture surface, as well as mechanical pressure on the tissue. The development of inflammation is accompanied by pain, burning, dry mouth, and an unpleasant odor, significantly reducing the patient's quality of life [2.3].

In addition to local complications, poor oral hygiene in patients with dentures can contribute to the development of systemic pathologies. Microorganisms colonizing the denture surface can penetrate the gastrointestinal tract and respiratory tract, increasing the risk of pneumonia, gastroenteritis, and exacerbation of chronic diseases. This is especially dangerous for elderly and debilitated patients, as well as for those with diabetes, anemia, chronic renal failure, or immunosuppression [2.5].

Thus, the issue of optimizing the hygiene of removable dentures is of not only dental but also general medical importance. Timely patient education on care procedures, the use of modern cleaning products, and the development of motivation for daily hygiene are key to preventing complications and extending the lifespan of orthopedic appliances.

Hygienic problems when wearing removable dentures

Despite the simplicity of design and widespread use of removable dentures, maintaining adequate hygiene remains a pressing issue in orthopedic dentistry. The surface of dentures provides a favorable environment for microbial adhesion due to its porous structure, microcracks, and microroughness in the base material. Within the first few hours of wearing the denture, a microbial biofilm forms on

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its surface, similar to dental plaque but significantly more resistant to mechanical and chemical stress [3.4].

The composition of the microflora of the denture plaque includes both saprophytic and pathogenic microorganisms: Streptococcus mutans , Lactobacillus acidophilus , Candida albicans , Staphylococcus aureus , etc. These microbes form stable biofilms capable of producing acids and toxins, causing inflammatory reactions in the mucous membrane of the denture bed. The most common cause is denture stomatitis , characterized by hyperemia, swelling, and burning of the mucous membrane. According to various authors, signs of denture stomatitis occur in 40–70% of users of removable dentures, especially with prolonged wear and the absence of regular disinfection [5.6].

An additional risk factor is the impaired self-cleaning function of the oral cavity in elderly patients. Decreased salivary flow, changes in saliva composition, and reduced buffering properties create conditions conducive to increased microbial growth. The denture then becomes a reservoir for microorganisms that contribute to chronic mucosal inflammation.

Poor hygiene also affects the mechanical and aesthetic properties of the denture. Failure to clean regularly can lead to discoloration of the base, the development of an unpleasant odor, and decreased adhesion between the denture and the mucosa. Increased protein and lipid deposits lead to microbial corrosion of the plastic, microcracks, and leaks.

Furthermore, researchers note that poor hygiene increases the risk of systemic complications . Microorganisms from the oral cavity can enter the gastrointestinal tract, respiratory tract, and even the systemic bloodstream, which is especially dangerous for patients with diabetes, chronic renal failure, and immunodeficiency conditions.

Therefore, poor hygiene when wearing removable dentures has a negative impact not only on oral health but also on the patient's overall health. To prevent these complications, it is essential to develop consistent hygiene habits in patients and use modern cleaning products that effectively remove plaque without damaging the denture structure.

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Modern methods and means of care for removable dentures

Modern orthopedic dentistry offers a wide range of tools to ensure proper hygiene of removable dentures. The primary goal of these measures is to remove soft and hard plaque, prevent microbial colonization, and preserve the physical properties of the base material.

Cleaning methods can be divided into mechanical , chemical , and combined . Mechanical cleaning involves the use of special brushes, pastes, and ultrasonic baths. Chemical methods rely on the action of antiseptic, oxygen, or enzymatic solutions, which effectively destroy microbial biofilms [7.9].

A combined approach, where mechanical cleaning is supplemented by periodic chemical disinfection, is considered the most rational. This method provides the best results with daily use and reduces the risk of developing denture stomatitis by 60–70 % [6].

Table 1. Comparative characteristics of products for hygienic care of removable dentures

Category of product	Examples of drugs	Mechanism of action	Advantages	Flaws
Mechanical	Special brushes and pastes for dentures (e.g. Protefix , ROCS Denture)	Removing plaque and food debris from the surface of the denture	Easy to use, no chemical exposure	Does not remove microbial colonies in micropores
Chemical (oxygen)	Cleaning tablets (Coregga Tabs, Protefix Active), peroxide solutions	Release of active oxygen, disinfection and odor elimination	High antimicrobial activity, whitening effect	May cause base color fading with prolonged use.
Enzymatic	Products based on proteases and amylolytic enzymes	Breakdown of protein and polysaccharide components of plaque	Safe for plastics, effective for long-term use	Requires time to soak in solution
Combined	Ultrasonic bath + denture solution	Mechanical and chemical action, destruction of biofilms	Maximum cleansing effect, removal of pathogens	Requires special equipment

Modern research shows that regular use of cleansing tablets containing active oxygen and enzymes significantly reduces the number of microorganisms on the surface of dentures. Furthermore, the use of ultrasonic baths (at a frequency of 35–45 kHz) helps break down persistent biofilms even in hard-to-reach areas.

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Particular attention is paid to products containing mild antiseptics - chlorhexidine , cetylpyridinium chloride, eucalyptus oil, which have a pronounced antimicrobial effect without irritating the mucous membrane.

Another promising approach is the use of nanocomposite coatings based on silver, zinc, or titanium dioxide, which prevent bacterial adhesion to the denture base. Such technologies are still in the clinical trials stage but demonstrate high potential for preventing microbial colonization.

Clinical aspects and prevention of complications

Clinical observations show that a significant proportion of patients wearing removable dentures develop inflammatory and degenerative changes in the oral mucosa over time. The most common complications are denture stomatitis , anginal cheilitis , halitosis , as well as a feeling of dryness and burning in the mouth.

Denture stomatitis

Denture stomatitis (stomatitis Prosthetic dentures (prosthetica) develop as a result of prolonged mechanical pressure, microbial contamination of the prosthesis surface, and decreased local immune defense. Clinically, the disease manifests as hyperemia and swelling of the mucous membrane, pain, and a burning sensation when chewing. In severe cases, erosive changes and secondary fungal infection, most often caused by Candida, are possible. albicans .

For the prevention of denture stomatitis the following are of great importance:

- regular mechanical and chemical cleaning of dentures;
- removing the prosthesis at night to allow the mucous membrane to rest;
- use of antiseptic mouthwashes;
- treatment of the denture base with antifungal solutions at the first signs of inflammation.

Angular cheilitis

Angular Cheilitis (angular cheilitis) often develops due to insufficient bite height or worn dentures, leading to maceration of the corners of the mouth. Chronic

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inflammation is aggravated by poor hygiene and the accumulation of microorganisms in the corners of the lips. Prevention requires prompt adjustment of the denture design and the use of regenerating ointments with antiseptic components.

Halitosis and changes in taste sensations

Bad breath (halitosis) is a common complaint among denture wearers, caused by the breakdown of protein residues and the activity of anaerobic bacteria. Regular disinfectant baths, oxygen solutions, and hygiene sprays containing zinc and peppermint essential oils are effective in eliminating halitosis .

To increase the effectiveness of preventing dental complications, it is recommended to adhere to the following principles:

1. Clean your denture at least twice a day – morning and evening.
2. Disinfection should be carried out once a week using solutions or an ultrasonic bath.
3. Remove the prosthesis at night and store it in a clean container with water or a special solution.
4. Have a check-up with an orthodontist once every six months.
5. If your mouth is dry, use artificial saliva or moisturizing gels.

Clinical studies have shown that patients trained in oral hygiene demonstrate a two- to three-fold reduction in the incidence of inflammatory complications. Therefore, complication prevention in removable denture wearers should be considered an integral part of comprehensive orthopedic rehabilitation.

Conclusion

Hygienic care of removable dentures is a key factor in successful orthopedic rehabilitation. The condition of the oral mucosa, the longevity of the denture, and overall quality of life directly depend on the patient's adherence to cleaning and disinfection guidelines.

Failure to comply with hygiene requirements leads to the accumulation of microbial biofilms, the development of denture stomatitis, angular cheilitis, halitosis, and other complications. Modern research confirms that systematic

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mechanical and chemical cleaning of dentures, combined with regular dental checkups, can reduce the incidence of inflammatory processes by more than half. The most effective approach is a combined approach, including the use of special brushes, ultrasonic baths, and antiseptic solutions. The use of cleansing tablets based on active oxygen and enzymes helps break down persistent biofilms, and the latest nanocomposite coatings with antibacterial properties offer potential for increasing the longevity of orthopedic structures.

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