

WAYS TO IMPROVE THE EFFECTIVENESS OF PERIODONTITIS TREATMENT IN DENTISTRY

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Abstract

This article examines the treatment of periodontitis, the importance of professional hygiene and the necessary medications, as well as methods for eliminating pathogenic flora in periodontal pockets and reducing inflammation.

Keywords: Treatment, complication, effective method, periodontitis, surgical treatment, disease, periodontal pockets.

Introduction

A healthy lifestyle and public health are among the priority areas of social development in the country. Therefore, dentistry is a strategic sector that determines the quality of life of the population. In the modern era of globalization and digitalization, scientific and practical work on oral health is becoming an important component not only of medicine but of the entire healthcare system. As a result of reforms implemented in the Republic of Uzbekistan in recent years, the healthcare system has undergone dramatic changes. In particular, the "New Development Strategy of Uzbekistan for 2022–2026" outlines such objectives as improving the quality of medical services to the population, strengthening preventive measures, and establishing cooperation between the public and private sectors. Thus, in dentistry, such areas as the introduction of modern technologies, increasing the number and quality of services in private clinics, and organizing personnel training based on international standards are being implemented.

In recent years, digital technologies, 3D modeling, CAD/CAM systems, intraoral scanners, laser and robotic surgery have been widely implemented in dentistry. This allows for faster treatment, the use of painless and minimally invasive methods, and the precision of prosthetics. For example, digital dentistry allows for the fabrication of a crown or veneer in a single day, significantly reducing patient time and increasing service efficiency. At the same time, expanding dental care in rural and remote areas, promoting preventive hygiene practices among the population, and strengthening the system for the early detection and prevention of dental diseases remain a pressing issue in our country. Accordingly, one of the pressing areas is improving the quality of surgical treatment for patients with chronic, widespread periodontitis by refining treatment strategies and developing effective methods for reducing complications. For many years, a minimally invasive hardware system has dominated the treatment and prevention of this disease. This system involves the antiseptic treatment of pathological periodontal pockets with an antiseptic solution obtained using the Prozone device, using a special disposable Perio tip for 18 seconds. Its use is virtually





painless due to the desensitizing effect of the suspension. This method allows for the solution of complex problems such as the removal of biofilm, granulation tissue, plaque, and endotoxins necessary for tissue restoration. It also enables the rapid and effective destruction of bacteria that cause the pathological process, de-epithelialization of the inner wall of the periodontal canal, and root planing without excessive loss of dentin cementum. Treatment is achieved through gentle treatment of the periodontal pocket with an antiseptic mixture generated in the Prozone device from the Austrian company W&H. The device's ultrasonic vibrations create a resonant sound, and the treated surface of the tooth root and surrounding tissue remains unchanged for a long time. This is achieved through the hydrodynamic action of ultrasound through a hydro-shell consisting of water. The various shapes of the device's working part ensure effective and atraumatic root surface smoothing in anatomically complex areas using a specialized disposable Perio tip. Furthermore, the spread of infection within the treatment facility is prevented. Due to the device's non-vibrating motion, contaminated aerosol is not released from the oral cavity into the environment. It is worth noting that the positive effects of the treatment begin to manifest themselves after the first few treatments: symptoms such as pain, bleeding, and suppuration are reduced. In recent years, ozone therapy has become widely used in dentistry. Ozone affects various stages of periodontal disease pathogenesis, primarily through the dynamic balance of lipid peroxidation (LPO) and antioxidant activity.

Ozone therapy improves periodontal tissue oxygenation. Ozone is highly water-soluble. When applied topically, it saturates biological fluids, destroys viruses, bacteria, and other pathogens, and activates the immune system and reparative processes. Ozone has no side effects, making it a viable alternative to antimicrobial agents. Therefore, this method can be recommended for patients with a history of allergies, intolerance, or ineffectiveness of antimicrobial therapy.

Antiseptic treatment of false pockets using the W&H Prozone device has resulted in the elimination of soft and hard supragingival and subgingival caries. An ozonized sodium hypochlorite (NaOCl) solution was used for oral antiseptic treatment. The sodium hypochlorite solution was obtained by oxidizing an isotonic solution of table salt using an EDO-4 electrochemical apparatus. To enhance the effect and improve periapical tissue microcirculation, the solution was ozonized. An ozone-oxygen gas mixture was bubbled through the sodium hypochlorite solution for 10 minutes using a UOTA-60-01-Medozon clinical ozonizer, after which the vial was placed in a household refrigerator (temperature 6-8°C). The tooth surfaces were then smoothed and restored with a fine paste using a brush.

Based on the above, it can be concluded that a significant clinical effect was achieved during observation of patients in the main group. Thus, the use of the Prozon device in the complex treatment of chronic disseminated periodontitis with a special disposable Perio tip in an 18-second equivalence mode and simultaneous antiseptic treatment of the pathological gingival pocket with an ozonized sodium hypochlorite solution allows for the achievement of stable and long-term remission. However, after one year, three patients (2.7%) experienced a relapse. This may be due to changes in dietary habits or place of residence, decreased immunity, the development of comorbidities or exacerbation of chronic diseases, as well as failure to follow the dentist's recommendations for oral care. The hygiene index, Müllemann bleeding index, papillary-marginal-alveolar index, and periodontal index were significantly lower than those in the control





group at the same time points after treatment.

Cytobacteroscopy results also indicate a reduction and disappearance of inflammatory processes in patients in the study group after 6 months and 1 year, as well as favorable regenerative processes in the gum tissue, accompanied by increased epithelial proliferation. In patients in the control group, inflammation returned to its previous levels 3 and 6 months after standard treatment. Bone regeneration of up to 3 mm was confirmed radiographically in patients in the study group, while no bone regeneration was observed in the comparison group.

Improving the effectiveness of periodontitis treatment is one of the most pressing challenges in dentistry, and this process requires a comprehensive, integrative approach that goes beyond clinical interventions. First, early diagnosis enables the early detection of periodontal diseases, significantly increasing the effectiveness of long-term treatment. The use of microbiological studies and biomarkers facilitates an accurate assessment of the disease and the development of individualized treatment plans. Professional hygiene and therapeutic measures (antiseptics, antibiotics, anti-inflammatory gels) are crucial in treatment. They help eliminate pathogenic flora in periodontal pockets and reduce inflammation. Physiotherapy methods (laser, photodynamic therapy, magnetic therapy) effectively improve blood circulation and accelerate tissue regeneration.

Surgical methods—curettage, flap surgeries, the use of osteoplastic materials and membranes—allow for the restoration of bone tissue and periodontal structure. Innovative technologies—laser periodontal therapy, plasma therapy (PRP/PRF), 3D planning—accelerate the healing process and improve the long-term prognosis.

Prevention of periodontitis recurrence is an integral part of treatment. Developing good hygiene habits, maintaining a healthy diet, and eliminating risk factors (e.g., quitting smoking and managing diabetes) are important factors in maintaining periodontal health. Regular preventive visits (every 3-6 months) help minimize disease recurrence.

Therefore, to maximize the effectiveness of periodontitis treatment, it is necessary to combine preventive, diagnostic, therapeutic, and surgical measures, utilize modern technologies, and promote active patient participation. This approach promotes high clinical outcomes in dental practice, long-term periodontal health, and improved patient quality of life.

Periodontitis is one of the most common and potentially serious oral diseases. Its main danger lies in its chronic, often painless, course, leading to delays in seeking treatment. As a result, irreversible changes occur in the periodontal tissues that support the teeth, leading to tooth mobility, dental deformities, and even complete tooth loss. Therefore, preventative measures are of paramount importance in the fight against periodontitis. Regular dental examinations, timely professional teeth cleaning, strict oral hygiene, and a healthy lifestyle help detect the disease early and halt its progression.

Modern treatment methods—laser therapy, plasmolyte injections, and technologies for restoring and polishing liquid tissue with osteoplastic materials—can significantly alleviate the course of periodontitis and improve the patient's quality of life. Treatment requires an individualized approach, taking into account the stage of the disease, the patient's age, general health, and metabolic status. Scientific research shows that a comprehensive approach to the prevention and effective treatment of periodontitis, combining dental, therapeutic, physical, and dietary (nutrition)





measures, yields the best results. The introduction of new technologies in this area, including bioregeneration methods, will further expand the possibilities of comprehensive treatment for periodontal diseases.

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