



## MODERN APPROACHES TO THE TREATMENT OF DESTRUCTIVE FORMS OF CHRONIC OSTITIS (LITERATURE REVIEW)

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### Abstract:

Despite significant advances in all areas of medicine, particularly dentistry, the treatment of patients with chronic ostitis remains an urgent problem for both dentists and scientists.

The difficulties that arise in the treatment of periapical changes in chronic forms of ostitis are that tissue regeneration in the area of the root tip occurs 6-12-24 months after the end of endodontic treatment. Therefore, many scientists are developing new tools to stimulate and accelerate periapical regeneration processes and improving existing methods.

**Keywords:** Osteoplastic Materials, Bone Microporosity, Bone Macroporosity, Jawbone, Regeneration

**INTRODUCTION.** The purpose of endodontic treatment is to eliminate pathogenic bacteria and their waste products, prevent re-infection, hyposensitize the body and eliminate the pathogenic effects of odontogenic inflammation on the body, and then hermetic obturation of the root canals of the tooth [1,3]. It consists in disinfecting the microflora of macro and microchannels during conservative endodontic treatment of patients with chronic forms of ostitis, eliminating the acute inflammatory process in the periapical area of the tooth, high-quality and hermetic obturation of root canals and stimulating the restoration of the structure of periapical tissues under the influence of endodontic fillers, accelerating regeneration processes in the periapical area [5,12].

Currently, in dental practice, the arsenal of drugs used to hermetically close root canals is very wide [2,10]. Conservative treatment of destructive forms of chronic ostitis with bone-plastic materials allows you to accelerate the regeneration of periapical chronic tissues and reduce the recovery time [6]. This creates conditions for the restoration of complete dental function without surgical intervention, and then there is the possibility of prosthetics. For many patients, this is very important [4]. Often, the unfavorable outcome of endodontic treatment of patients with chronic forms of ostitis and the cause of the appearance of chronic foci of inflammation in the periapical zone is poor-quality treatment along with the preservation of pathogenic microflora in the root canals and the entry of its waste into the periapical space [8]. Therefore, today, an important task of modern dentistry associated with the problem of dental preservation is the development and improvement of new conservative methods of treating

patients with chronic forms of ostitis, since there are many complications arising from the treatment of this pathology. To speed up the restoration process and antibacterial effect on periapical tissues in complex caries, as a rule, preparations based on calcium hydroxide (Calasept, Swesia) with long-term bactericidal, anti-inflammatory, hemostatic, osteotropic and osteoplastic effects are used. Studies have shown that the introduction of calcium hydroxide into the root canal has contributed to a decrease in the inflammatory process and often to the cessation of exudate production from the periapical site [1,9].

After filling the root canal with a temporary paste based on calcium hydroxide, a process of bone tissue restoration is observed in the periapical area. Calcium hydroxide inhibits bone resorption through osteoclast activity and restores osteogenesis due to its effect on osteoblast activity, having a lysing effect on necrotic tissues [7]. Calcium ions stimulate dentin and cementogenesis, activate protein phosphatase, which is involved in collagen synthesis. Calcium hydroxide penetrates the root canal and absorbs moisture from microtubules, increasing its volume, ensuring that the filler fits tightly into the walls of the channel and penetrates into microtubules. But by spreading deeper into dentin, calcium hydroxide loses the concentration of hydroxide ions, which leads to a decrease in pH value and thus a weakening of antibacterial properties. Treatment of periapical tissue in teeth treated with chronic ostitis with calcium hydroxide paste lasts from 6 to 24 months from the beginning of treatment and requires multi-stage intervention.

The long-term antibacterial effect of the drug is due to its ability to maintain a high alkaline



environment. Consequently, over time, blood, exudate and tissue fluid gradually decrease the pH value, which leads to a decrease in its antibacterial properties. The first time the paste is replaced after 10-14 days, the second time after 3 weeks, and then after 3 months [3,11]. At the same time, the long presence of calcium hydroxide in the root canal of the tooth, in addition to its antibacterial effect on microorganisms, affects the organic structure of dentin, denatures protein structures and reduces the percentage of organic and inorganic components of dentin, which increases the fragility of dental tissues [10]. Positive results can be achieved by obturating the apical part of the root canals of permanent teeth at the same time as the broad root tip, using the generally accepted filling technique of the most studied material in dentistry – mineral trioxide aggregate (MTA) (Serkamed, Poland). After disinfecting the root canal of the tooth, this method allows the formation of an apical plug that hermetically separates the periodont tissue from the cavity of the root canal [15]. The filler material has maximum biocompatibility to the tooth tissue, which contributes to the deposition of cement. MTA is a compound of tricalcium oxide, tricalcium aluminate, tricalcium silicon, and silicic acid. The powder contains hydrophilic parts, which polymerize into a moisture or blood-forming colloidal gel, forming an impenetrable barrier and providing high-quality obturation over time. MTA has a high pH value, thanks to which it has a good bactericidal potential.

Another relatively new treatment for chronic ostitis is the use of second generation bioceramic materials, which includes the drug biodentin (Septodont, France). Based on calcium silicate with properties similar to MTA, this cement ensures the formation of relationships between the root canal system and periodontal tissues. The improved biocompatibility of this material, as well as its ability to stimulate the deposition of calcium phosphate on the surface of periodontal tissues, play an important role in the restoration of bone tissue during periapical destruction. The interaction of material and dentin reduces the risk of marginal destruction and provides long-term clinical success. Their slow hardening and altered composition of the Biodentine powder are a disadvantage of this class of materials. However, scientists continue to work on improving the physical properties of this material [2,4,7].

Treatment of destructive forms of ostitis during the root canal filling phase to promote regeneration of periapical tissue is done with bioceramics ("Busa", Switzerland). The special chemical composition of bioceramics (calcium silicate, zircon oxide, tantalum oxide, calcium phosphate) produces excellent

mechanical and biological properties, and also stimulates the regeneration of periapical dental tissues [14]. Zhdanova N.A. proposed a new method of treating chronic apical ostitis: at the stage of temporary obturation of root canals, photoactive disinfection is carried out using a laser therapeutic device "Lika-therapist m" using a 10% solution of povidone iodine as a photosensitizer, and then replenishing the root canals with a photosensitizer. However, this method of treating chronic ostitis requires repeated filling of the root canal and differs in the duration of treatment. Another modified technology of endodontic interventions involves primary irrigation of the root canal with the antiseptic drug carinoxidine, followed by exposure to the periapical destruction site with cyclophosphane and hydroxyapatite Siler "Ostim-100". This method of complex endodontic treatment of destructive forms of chronic ostitis allows periodontal tissues to simultaneously have antibacterial, anti-inflammatory, cytostatic and osteotropic effects [13]. In teeth with preserved apical narrowing, it is recommended to treat chronic ostitis on one visit; in the case of partially preserved teeth, however, it is recommended to prepare the root canal for the X-ray working length of the tooth and visit it twice using a medicinal bond based on calcium hydroxide [5,9].

Some scientists have proposed a medicinal composition to temporarily fill the root canal in the treatment of chronic osteitis. Taking into account the etiology of the forms of ostitis, scientists have proposed a therapeutic complex that includes "Phosphadent-bio", ofloxacin and nistatin. It has an effective long-term antimicrobial effect in repeated treatment. It is recommended to send the dough into the channel for 5 days under an airtight temporary seal. In the chronic granulation form of ostitis, the authors additionally recommend using the effects of high-intensity laser radiation [13]. A group of researchers studied the possibility and feasibility of endodontic treatment of patients with chronic forms of ostitis using apical exposure materials and methods. At the same time, the clinical efficacy of transcanal optimizing effect on the processes of reparative regeneration of periapical bone tissue was based. Therefore, apical therapy is proposed to fully affect the periapical center of inflammation and stimulate tissue regeneration around the tip of the tooth root [14]. Another treatment for patients with chronic forms of ostitis is the use of chitosan gel preparations that have an antibacterial effect on the root canal microflora to affect the periapical tissues of the ostitis tooth, and when the proposed drugs were transchanalally removed into the periapical space, the regeneration of periodontal tissues was optimized [17].



The recommended method of treatment using nanostructured hydroxapatite gel and nickelid helps to restore structural changes in the periodont and restore the bone tissue of the periapical zone. Material resorption at the destruction Center occurs simultaneously with the bone recovery process [11,16]. Another method of treating patients with chronic ostitis is the use of a new composition of the drug "kolapan-gel" with the enzyme imozimase, which activates recovery processes in the periodont [18].

**CONCLUSION,** in order to improve the effectiveness of the treatment of inflammatory and destructive chronic ostitis, modern dentistry has developed certain standards of endodontic treatment, including effective suppression of the microflora of the root canal system, stopping the penetration of microorganisms and their endotoxins into periodontal tissues, eliminating inflammation in periapical tissues; restoring structure and function, stimulating bone recovery processes in the

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