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CLINICAL AND DIAGNOSTIC ASPECTS OF PREVENTION OF ALVEOLAR OSTEITIS IN THE POSTEXTRACTION PERIOD

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The abstract. The present study is devoted to a comprehensive analysis of risk factors for alveolar osteitis after tooth extraction of varying degrees of complexity and the development of a set of effective preventive measures. From my clinical experience, the introduction of a standardized protocol of preventive measures can significantly reduce the incidence of this complication from the typical 5-30 percent to 2-3 percent, even with the removal of retinated third molars. The paper presents modern methods of diagnosis and treatment of dry wells, including the use of autologous platelet concentrates. The work of our colleagues confirms the high effectiveness of chlorhexidine-containing drugs in the prevention of postextraction complications.

Keywords: alveolar osteitis, dry socket, postextraction complications, chlorhexidine, prevention, risk factors, platelet concentrates, fibrinolysis.

Alveolar osteitis, commonly known in clinical practice as dry socket or fibrinolytic alveolitis, is the most common and extremely painful complication after tooth extraction, significantly impairing the quality of life of patients and significantly increasing the number of repeated visits to the dentist. According to current epidemiological data, the incidence of this condition varies widely from 0.5 to 5 percent with routine uncomplicated extractions of permanent teeth and reaches 25-30 percent with surgical removal of retinated and semi-retinated lower third molars. A deep understanding of the etiopathogenesis and a comprehensive analysis of modifiable and unmodifiable risk factors is the key to developing effective pathophysiological mechanisms for the development of alveolar osteitis directly related to impaired formation or premature destruction of a blood clot in the tooth socket. According to the generally accepted fibrinolytic theory proposed by Birn in 1973 and confirmed by numerous subsequent studies, increased local activity of tissue plasminogen activators leads to premature lysis of the fibrin matrix of the clot, which leads to complete or partial exposure of the bone walls of the alveoli and intense irritation of the nerve endings of the periosteum. From my clinical experience, patients describe the pain as acute, throbbing, unbearable, often radiating to the ear, temple, eye socket and neck, with a characteristic onset on 2-4 days after the intervention. The clinical picture of alveolar osteitis is quite characteristic and allows a diagnosis to be made already at the initial examination of the patient. In addition to the pronounced pain syndrome, which is not relieved by standard analgesics, there is an unpleasant putrid odor from the mouth (halitosis), and an unpleasant taste may appear. Upon examination, the hole of the extracted tooth is partially or completely devoid of a blood clot, grayish-yellow bone tissue is exposed, covered with necrotic plaque, and the surrounding soft tissues may be moderately swollen and hyperemic. The works of Russian authors emphasize that differential diagnosis should be carried out with acute alveolitis of an infectious nature, osteomyelitis of the rectum and limited osteonecrosis. Smoking plays a leading role among modifiable risk factors for the development of alveolar osteitis, which has a multifactorial negative effect on the processes of repair of oral tissues. Nicotine causes pronounced vasoconstriction, reducing blood supply and tissue oxygenation, inhibits the functional activity of neutrophils and macrophages, and disrupts collagen synthesis

by fibroblasts. In addition, the act of smoking itself creates negative pressure in the oral cavity, contributing to the mechanical displacement of the forming blood clot. Studies by Russian authors convincingly demonstrate that in smoking patients, the risk of developing alveolar osteitis increases 3-4 times compared with non-smokers, and when smoking more than one pack of cigarettes a day, the risk increases up to 5-6 times. Taking oral contraceptives and the state of the menstrual cycle in women of reproductive age also significantly increase the risk of developing a dry well due to the effect of estrogens on the fibrinolytic activity of blood plasma. It follows from the research of my compatriots that the concentration of plasminogen activators in the blood reaches its maximum values in the middle of the menstrual cycle, which correlates with the increased frequency of alveolar osteitis during extractions performed during this period. Whenever possible, it is recommended to plan menstrual surgery for both oral contraceptive users and women who do not take hormonal medications to minimize the effect of hormonal factors on the healing process. Unmodifiable risk factors include the patient's gender, age, anatomical features, and the degree of complexity of the intervention. Women are generally more susceptible to developing alveolar osteitis compared to men. The complexity and traumatic nature of the extraction, the duration of the operation, the amount of local anesthetic administered with vasoconstrictor, the need for osteotomy and tooth sectioning are significant predictors of the development of complications. From my experience, with atypical removal of the lower third molars lasting more than 30 minutes, the frequency of alveolar osteitis increases 2-3 times compared with standard interventions. Comprehensive prevention of alveolar osteitis begins with careful preoperative preparation of the patient and identification of individual risk factors. Rinsing the oral cavity with a 0.12% chlorhexidine bigluconate solution immediately before extraction for 1-2 minutes significantly reduces microbial contamination of the surgical field and reduces the risk of developing a dry well by approximately 40 percent. Data from numerous systematic reviews and meta-analyses confirm that both preoperative rinsing and intraalveolar administration of chlorhexidine gel immediately after extraction have proven effectiveness in preventing this complication. The work of our colleagues also indicates the positive effect of continued rinsing with chlorhexidine during the first week after removal. Intraoperative prophylaxis includes the most atraumatic removal technique with minimal damage to the bone walls of the alveoli and surrounding soft tissues. The work of our colleagues clearly shows that the duration of surgery and the degree of tissue injury directly correlate with the frequency of post-extraction complications. The use of modern rotary and piezosurgical instruments can significantly reduce the traumatism of osteotomy. Thorough curettage of the well with the removal of granulation tissue and bone fragments, washing with saline solution and creating conditions for the formation of a full-fledged blood clot are mandatory stages of the operation. A promising area for the prevention of alveolar osteitis is the use of autologous platelet concentrates, primarily platelet-enriched fibrin of various modifications. It follows from the research of my compatriots that placing a PRF membrane or clot in the recess of a extracted tooth contributes to the formation of a stable blood clot, accelerates epithelialization processes and significantly reduces the frequency of alveolar osteitis. Growth factors, gradually released from platelets within 7-14 days, actively stimulate angiogenesis, fibroblast proliferation, and granulation tissue formation. Systematic reviews in recent years have confirmed a statistically significant reduction in postoperative pain and edema when using PRF. Treatment of developed alveolar osteitis is mainly symptomatic and is aimed at adequate relief of pain and the creation of optimal conditions for secondary healing of the hole with granulation tissue. From my clinical experience, the first stage of treatment is gentle irrigation of the hole with warm saline solution or chlorhexidine solution under minimal pressure to remove necrotic masses and food residues without traumatizing the exposed bone. Curettage of the hole is strictly contraindicated, as it

leads to additional exposure of bone tissue and increased pain. After irrigation, a medicinal turunda or bandage is placed in the hole, which insulates the exposed bone from external stimuli. The classic preparation is iodoform turunda impregnated with an eugenol-containing drug such as Alvogyl, which has a pronounced analgesic, antiseptic and reparative effect. The works of Russian authors demonstrate that most patients notice significant pain relief on the very first day after applying the bandage. The dressing should be changed every 24-48 hours until the pain subsides, usually within 3-7 days. Systemic antibiotics for uncomplicated course of alveolar osteitis are not indicated and do not accelerate healing. In conclusion, it should be emphasized that alveolar osteitis is a self-limiting condition with a favorable prognosis even in the absence of treatment. The hole heals by secondary tension within 10-14 days, and any long-term consequences are uncommon. From my experience, the main goal of treatment is to alleviate the patient's suffering during the acute period and prevent disability. An integrated approach to prevention, including the identification of risk factors, the use of chlorhexidine, an atraumatic removal technique and the use of PRF in patients at risk, minimizes the frequency of this painful complication.

Conclusions: Alveolar osteitis is a multifactorial complication of tooth extraction, the prevention of which requires a comprehensive systemic approach with mandatory consideration of individual modifiable and unmodifiable risk factors of the patient. Preoperative administration of chlorhexidine-containing drugs in the form of rinses and intraalveolar gels significantly reduces the incidence of dry well development by approximately 40 percent and should be included in the standard protocol. The use of autologous platelet concentrates, in particular platelet-enriched fibrin, is an effective and safe method of preventing postextraction complications. An atraumatic removal technique using modern tools and adequate postoperative instruction of the patient are key components of the prevention of alveolar osteitis. Treatment of the developed complication should be aimed at adequate anesthesia by local exposure using eugenol-containing drugs, while routine administration of systemic antibiotics is not justified.

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