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Acute Purulent Inflammation of the Joints in Case of Burns of the Disease

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Abstract: According to a number of authors studying this problem, in case of burn disease, first of all, circulatory disorders and their consequences are observed, during the period of exhaustion - severe dystrophic changes in organs that can lead to disability [13]. According to the World Health Organization, burns rank fourth among all causes of injury.

Keywords: Metastic, Surgical treatment, septicotoxemia, Despite.

Currently, cases of household burns account for 3-6% of the total number of peacetime injuries and its mortality does not tend to decrease, which ranges from 2.1% to 36.9% [1]. Burns are ranked fourth among all causes of injury by the World Health Organization. Burn injuries remain a serious public health problem in the 21st century [1,2,4]. They have a significant impact on patients with physiological, physical and emotional consequences that are both acute and often long-lasting [3]. Recovery from such a burn is often lengthy and requires special care to avoid disabling patients [5]. About 8.5 thousand burned people receive treatment in Uzbekistan every year [6,7].

This is due to the high energy capacity of modern production, transport, and the widespread use of high-voltage currents of aggressive chemical liquids and explosive gases [8].

The total mortality rate among those burned in Western European countries ranges from 0.6 - 5.1%, in specialized departments of the Russian Federation - 5.5 - 6.0%, and in deep cases - 13-14% [10]. High mortality remains even with burns with an area of 30 to 50% of the body surface. In recent decades, special attention has been paid to the study of the causes of complications in burns, which are of great importance in building a treatment plan for victims [12,14].

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Deep burns with damage or exposure of deep anatomical structures (tendons, joints, bones, neurovascular bundles) are most often observed in contact with hot objects.

They are also often found in sandalwood burns and electric shock [16,19]. The frequent occurrence of deep burns in Central Asia is due to the fact that sandalwood is still used for heating in the cold season. Sandalwood burns (“crippling burns") are characterized by the most severe, deep tissue damage, even charring of the distal parts of the lower extremities.

The modern literature contains numerous information about the pathogenesis of burns of the III-IV degree, clinical manifestations, methods of their early diagnosis and treatment, which reveals disagreements and opinions of the authors, indicating the need for further study of this problem. To facilitate the choice of the optimal treatment method for deep and widespread thermal lesions, most authors distinguish several periods of burn disease, which are divided into a period of shock (1-3 days), acute toxemia (3-14 days), septicotoxemia (from 3 weeks to several months) and convalescence (from several months to one and a half years) [17,18].

It should be noted that this period may develop after burn shock or without its antecedence and, with deep lesions, passes into stage III of burn disease - septicotoxemia, which coincides with the onset of suppuration in burn wounds. With lighter burns, toxemia in most cases ends in recovery. Septicotoxemia replaces acute burn toxemia and is characterized by phenomena associated with wound suppuration, the addition of an increasing purulent infection (the causative agents of which are Staphylococcus, Pseudomonas aeruginosa, E. coli, proteus, etc.), manifested by purulent-resorptive fever and the development of other purulent-inflammatory complications [20]. Some authors conditionally divide this stage into two periods: 1 - from the moment of rejection of the scab to the appearance of granulation tissue., 2 - from the moment of appearance of granulation tissue to complete recovery or to plasty of the autoderm. In the first period, the wound is cleansed of necrotic tissues, while inflammation of the surrounding tissues occurs in parallel. With extensive deep burns, which become huge entrance gates for pathogenic microorganisms, heat, water, protein and salts are constantly lost, and the resulting environment is food for a wide range of bacteria and fungi. In such cases, suppuration and a decrease in the body's resistance occur at the site of the formed defect, the development of sepsis is not excluded, which worsens the general condition of patients and the appropriate therapy [21].

It should be noted that the presence of bacteremia does not indicate the development of sepsis or septicopyemia, since it can also be detected in healthy people. The diagnosis is made on the basis of characteristic clinical manifestations and laboratory data [22]. In these cases, fever acquires a hectic character, anemia and hypoproteinemia increase, and granulation tissue becomes sluggish, pale and bleeding, which is the reason for the prolongation of the wound healing process. Bedsores often appear, and sometimes metastatic purulent foci [23].

According to the literature, purulent arthritis of the lower extremities occurs in 1-4% of burned patients. Despite the frequency and severity of purulent arthritis of the lower extremities in burn disease, the number of publications on this issue is very small. It was only in recent years that purulent inflammation of the joints began to be called among other complications of burn disease. Some aspects of this pathology are addressed in their works [24,].

The course of purulent inflammation of the joints of the lower extremities in burned patients has a number of significant features. The general manifestations of arthritis are masked by the clinic of the underlying disease, and the presence of wounds in the area of most affected joints creates additional difficulties in diagnosis and treatment. Given this circumstance, it is of particular interest to study the timing of the development of purulent arthritis of the lower extremities, depending on such causes as the area of deep burns, complications and concomitant diseases, as well as the effectiveness of the treatment [20].

It should be noted that information on the pathogenesis of burns is of great importance for reducing the frequency of purulent arthritis in burn disease, which, despite the emergence of new highly informative diagnostic equipment and numerous studies, still remain controversial [22].

The clinic of purulent inflammation of the joints of the lower extremities in burned patients is very variable – from a complete symptom complex of acute purulent arthritis to a barely perceptible response of the body. The severity of the clinical manifestations of arthritis is determined, in addition to the individual characteristics of the victims, by four main factors: the area of deep burns, the severity of the patient's general condition at the time of the development of arthritis, the localization of the process and the ways of infection into the joint. The larger the area of deep burns and the more severe the general condition of the burned person, the less likely the rapid course of arthritis is. Erased, low-symptomatic forms of purulent lesions of the joints of the lower extremities were more often observed with the destruction of the articular capsule due to necrosis of burn wounds. Metastic lesions, even against the background of an extremely serious condition of the victims, are usually manifested by a complete symptom complex of acute arthritis.

The most persistent symptoms of purulent arthritis were pain during passive movements and inhibition of reparative processes in burn wounds. The occurrence of only 15% of arthrosis was accompanied by

an increase in fever; an increase in the number of leukocytes and the index of the shift of the leukocyte formula to the left and a response to the development of the process in the joint were noted in only 25% of our observations [14].

The X-ray method of examination for burns is mainly used to diagnose lesions of bones and joints. Conducting an X-ray examination for burns in many cases is associated with certain methodological difficulties due to the severe general condition of the victims, pronounced soreness in the area of the burn wound (often very extensive), limited joint mobility, as well as the forced position of the limbs and body of the victims. At the same time, even with deep burns limited in area to 10-15% of the body surface, the general condition of the victims is not significantly impaired [8, 15]. Filming is usually carried out without changing the position of the victim. If necessary, the optimal projections for shooting are determined by preliminary fluoroscopy. Objective circumstances often force radiography to be performed in oblique projections. Valuable additional information about the condition of bones and soft tissues can be obtained using radiography with direct multiple magnification of the X-ray image [15].Radiologically detectable changes in the bone system occur mainly in severe burns of the III and IV degrees, less often in burns of the II degree and extremely rarely in burns of the I degree. They occur mainly in the third and fourth periods of burn disease, i.e. at least 2-3 weeks after injury, and with modern active treatment - later, because the use of antibiotics prevents the development of osteomyelitis and arthritis, and the elimination of pain syndrome postpones the development of osteoporosis. Foreign authors have data on the use of magnetic resonance imaging (MRI) in the diagnosis of manifestations of skin and soft tissue damage. When using spin echo (SE) and fast spin echo (FSE) on a 1.5 Tl MP tomograph, early detection of latent tissue damage, edema and necrosis zones in patients with high-voltage electric burns is possible [Thuomas K.A., Sjöberg F., 1999]. Thermography may be useful in determining the boundaries of a burn lesion, however, the specificity of this method of radiation diagnosis is low, and when an infection is attached, its results may be inaccurate [14]. Recently, there have been reports on the use of modern thermal imaging methods for diagnosing the depth of a burn lesion in order to distinguish between IIIA and SB degrees and determine indications for surgical treatment [10].

It should be noted that in recent years, significant changes have occurred in the field of combustiology in the provision of specialized medical care to victims who have suffered burn injuries, but issues related to surgical care for the burned and the choice of surgical treatment tactics for deep burn lesions of the III-IV degree remain debatable. The existing domestic and foreign publications, monographs and manuals devoted to the problems of diagnosis and treatment of victims of burn disease, especially with its deep lesion, do not summarize the available disparate opinions on surgical treatment of burns.

Surgical treatment is one of the most urgent problems of kombustiology. Like any multidisciplinary task, the treatment of burned patients should be a symphony of interaction between anesthesiology and intensive care, clinical pharmacology, laboratory diagnostics, tissue engineering, medical psychology, nutritionology and many other specialties. However, surgery remains the first fiddle determining the tactics and prognosis of treatment of the victim, and in the future, its importance will only increase.

The term surgical treatment refers to the range of surgical procedures performed for burns. The toilet of wounds, bloodless chemical necrolysis, and the change of bandages cannot be attributed to this category as they do not have significant signs of surgical operation: separation and connection of viable tissues, the presence of significant trauma [23]. Adding these manipulations to the list of operations may have an economic effect in confrontation with insurance companies, but it slows down the development of kombustiology, masking low surgical activity, forming an attitude towards surgery as a routine safe manipulation that does not require special skills and training [11].

All surgical interventions aimed at the treatment of deep burns are divided into three types: necrotomy, necrectomy and skin grafting [4,13,23]. In the first 4-8 hours from the moment of injury, when a compressive scab is forming, nectomy is performed with a linear incision carried out to viable tissues, as evidenced by the appearance of capillary bleeding, and only on 6-8 days after the completion of dry necrosis, the second stage of the operation is performed-necrectomy. In order to adequately perform

autodermoplasty - the third stage of the operation and reduce the frequency of purulent-inflammatory complications, topical antibacterial and antiseptic drugs are used that improve the metabolic processes of the body and normalize the PH (7.3-7.5) of the affected area of the body [13]. The main purpose of the treatment of patients who have suffered a burn injury is to stimulate the healing processes of damaged body tissues, reduce the time of relief of inflammatory and intoxication reactions, preserve the functional ability of the damaged organ, reduce the length of stay of victims in the hospital and reduce the frequency of invasive outcomes [12].

The unfavorable outcomes of the treatment of deep burns are largely determined by the tactics of treatment of victims widely used so far, which consists in staged necrectomies, osteonecrectomies, preparation of granulating wounds and their closure by free skin grafting [18]. Over the past decades, there have been a significant number of reports on the use of bioactive nanostructured wound coatings with high sorption, antiseptic, antioxidant, and enzyme activity, capable of having a complex effect on the main links in the pathogenesis of the wound process in both its first and second phases.

The choice of the method of surgical treatment of arthritis in burned patients depends mainly on the severity of the patient's general condition, the nature of pathological changes in the joint and the prevalence of deep burns on the corresponding limb. Surgical treatment of patients with purulent arthritis should be combined with measures aimed at increasing the overall resistance of the body. Strengthening transfusion and antibacterial therapy is of paramount importance. In cases where, in severely exhausted patients, perforations resulting from penetration into the joint of wounds or bedsores provided sufficient drainage, refrains from active surgical interventions and is limited to the removal of sequesters, the imposition of plaster splints and constant irrigation of the joint cavity with antiseptics.

The most important measure in the prevention of arthritis in the burned is timely skin grafting, because while there are burn wounds and, above all, wounds in the joints, there is also a danger of developing this serious complication.

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