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OPTIMIZATION OF TREATMENT OF ISOLATED BURNS OF THE HAND AND FOOT

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Abstract
The study was conducted on data from the examination and treatment of 81 victims with deep burns of the hands and feet. Silver-containing preparations were applied to the wound surfaces, after which the limbs were placed in plastic bags (group I, n=46). In some patients (group II, n=35), wounds were treated using the traditional method with various ointments and solutions. Every day, accumulated liquid was removed from the bags, its volume was measured and subjected to biochemical analysis. Silver cream-containing preparations were replaced with a new one. After stopping the flow of plasma through the wound surfaces and cleaning the wounds from fibrin deposits, treatment was carried out using ointment dressings.

Keywords. Silver-containing preparations, cysts and foot, moist environment.

Introduction

In recent years, the number of victims with cicatricial deformities and contractures of the hand and feet has been increasing, which is associated with an improvement in the quality of treatment of burn disease [1]. Burns of the hand and feet, among other localizations, are one of the first places among industrial injuries [2]. The use of complex treatment for victims of deep burns of the hands and feet does not always give the desired result, and up to 45% of patients develop severe scar deformities, the correction of which is possible only with the use of surgical treatment methods. The majority of patients with consequences of hand burns (according to our data, up to 75%) are people of working age from 20 to 50 years [3,4]. Among the etiological factors of burns, flame comes first (in 83% of cases), and in children with consequences of foot burns, up to 47.7% are sandalwood burns under 3 years of age.

In the structure of burn injuries, special importance is currently given to burns of the hand and foot [5]. A long period of disability and hospitalization, a large percentage of complications lead to high financial and emotional costs for a person. It should be noted that the frequent incidence of deep burns on the hands and feet in children in Central Asia, particularly in Uzbekistan, is due to the fact that sandalwood is still used for heating in the cold season. Sandalwood burns in children are characterized by severe, deep tissue damage, even charring of the distal limbs [10-12].

In case of deep burns due to necrosis of all layers of the skin, there is a need for autodermoplasty. The process of repair of wounds, including burns, is cyclical. According to the classification of M.I. Kuzina distinguishes three main phases of the wound process: inflammation (the period of vascular changes and the period of cleansing the wound from necrotic tissue), regeneration, scar

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reorganization and epithelization. With burns, both direct primary tissue damage and secondary alteration occur, mainly as a result of vascular disorders in the paranecrotic zone. Drying of tissues increases the area of damage. For many years, the tactics of managing burn wounds under a dry eschar have been used, but the results of modern research indicate an increase in the effectiveness of burn repair in a moist environment [6,7]. Modern methodology for local conservative treatment of wounds is based on the differentiated use of agents that allow targeted influence on the wound process, depending on its phase and characteristics of its course [8].

One of these conditions is the creation of a moist environment on the surface of the wound. In a physiological moist environment, optimal conditions are created for cell proliferation, tissue repair and reduction of the area of paranecrotic changes. Currently available technologies ensure the maintenance of a moist environment in the wound through hydrophilic external agents or a variety of wound coverings. Thanks to modern technologies, a moist environment is maintained during all phases of the wound process: inflammation, formation of granulation tissue and healing. However, to date, no wound covering has approached the ideal in its properties. As a result, intoxication often worsens, the area of paranecrosis increases, infection and the formation of rough scar tissue occur. A significant disadvantage of coatings is additional trauma to the burn wound during the dressing process. The high cost of modern wound dressings is also important. One of the possible promising areas of combustiology seems to be the creation of an artificial liquid medium on the burn surface [9].

Purpose of the study. To expand knowledge about the possibility of a moist environment in the regeneration of a burn wound.

Material and method of research:

The study was conducted on data from the examination and treatment of 81 victims with deep burns of the hands and feet. Silver-containing preparations were applied to the wound surfaces, after which the limbs were placed in plastic bags (group I, n=46). In some patients (group II, n=35), wounds were treated using the traditional method with various ointments and solutions. Every day, accumulated liquid was removed from the bags, its volume was measured and subjected to biochemical analysis. Silver cream-containing preparations were replaced with a new one. After stopping the flow of plasma through the wound surfaces and cleaning the wounds from fibrin deposits, treatment was carried out using ointment dressings. The timing of scab rejection and completion of wound epithelization was noted. The intensity of microbial contamination of wounds and the type of vegetative microorganisms were determined; a total of 112 microbiological studies were performed. In the exudate by performing an enzyme immunoassay using a test system.

Results and discussion:

The first group of patients, soon after placing the hand and foot in bags, the so-called “greenhouse effect” arose inside them. At the same time, in the air mixture inside the bag there was an increased tension of water vapor and carbon dioxide, the oxygen content was, on the contrary, reduced. Already 1 hour after the start of treatment, moisture began to condense on the inner surface of the bag, the amount of which gradually increased. After some time, a gray-white liquid appeared at the bottom of the bag, consisting of a silver-containing drug and wound

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exudate, the amount of which gradually increased. The most intense flow of exudate occurred during the first day after injury, amounting to 400 - 500 ml. In subsequent days, the amount of fluid leaked decreased. Sweating of fluid through the wound surfaces stopped for 7 to 10 days. Significantly less fluid was released in the following cases: if most of the wounds were III-b degree burns, or if the hand or foot was partially burned. Already on the 2nd day after the start of treatment, a thick layer of fibrin was found on the surface of the wounds. The wound looked untidy. Fibrin was removed daily, cream was reapplied to the wound surfaces, and the limbs were placed in plastic bags. This type of treatment was carried out for 7-12 days, as a rule, until the wound exudate stopped flowing. After this, the wounds were treated with bandages with water-soluble ointments. It was noted that the cleansing of wounds from dead tissue occurred, as a rule, quickly (within 10-14 days) and painlessly for the patient. Removal of dead layers occurred during daily dressings along with fibrin deposits. Within a period of 10 to 14 days, viable dermal papillae were exposed. It was found that when the skin was damaged at the level of the dermal papillae, the wounds healed within 16-18 days. In case of an extensive deep burn in the area of the hand and foot, skin grafting was usually carried out on the 16th–17th day after the burn with a perforated or non-perforated skin graft with a thickness of 0.2–0.3 mm.

The 2nd group, which served as a control group, included 35 patients who were admitted in the first three days from the moment of injury and received traditional treatment. A thick layer of fibrin also fell out on the surface of the wounds; in a relatively early period, the wounds were cleansed of dead tissue and epithelization was completed. The healing time of wounds was close to those when the brush was handled in large bags. At the same time, there were also differences. In particular, there was no such abundant release of fluid through the wound surfaces. In no case was the phenomenon of “decreasing the depth of the burn” noted. For extensive deep burns in the area of the hand and foot, chemotherapeutic solutions were used to accelerate the rejection of dead tissue. Plastic surgery was usually performed on days 22–24 after the necrotic eschar was sloughed off after a burn with a perforated or non-perforated skin graft 0.2–0.3 mm thick.

When conducting biochemical analyzes of the fluid flowing into the bags, obtained during the treatment of patients in group I, it was found that on the first day after the injury, the protein content in it reached 55 g/l and in subsequent days gradually decreased to 20-30 g/l. When carrying out electrophoresis, it was established that over time certain changes occurred in the nature of the exudate. In particular, in the early stages after injury, “acute phase” proteins predominated, subsequently their number decreased and, starting from 4-5 days, the effusion acquired the character of a transudate. Tissue proteases and fibronectin were detected in the exudate. The content of electrolytes (K+, Na+, Cl+) in the fluid flowing through the wound surfaces was slightly lower than in the blood plasma.

It is very interesting that when silver-containing creams were used and the hands and feet were placed in large bags in the liquid flowing through the wound surfaces, the content of pro-inflammatory cytokines (IL-1 and IL-8) was many times greater (in some cases 100 times and more) compared to the fluid of burn blisters in victims with second degree burns. Apparently, it is the induction of these cytokines that is associated with an increase in fluid permeability through the vascular wall.

Conclusion:

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The use of a silver-containing preparation in a humid environment promotes rapid healing of superficial burns of the hand and foot, cleansing of deep burn wounds, reducing treatment time and reducing the number of complications.

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