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## EVALUATION OF THE COMPLICATIONS OF TRAUMATIC LOWER LIMB AMPUTATIONS DUE TO GUNSHOT WOUNDS

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**Annotation.** The results of treatment of 30 injured with traumatic lower limb amputations were investigated. Early complications of traumatic lower limb amputations were observed in 8 patients, late complications in – 22 patients. Early complications required repeated surgical interventions. To prevent late complications, proper care of the stump skin must be adhered to, and the duration of prosthesis use should be gradually increased.

**Key words:** explosive trauma, traumatic amputation, surgical interventions, complications.

**Introduction.** Under the conditions of a full-scale war between Russia and Ukraine, the problem of traumatic limb amputations due to gunshot wounds arises. According to the Anti-Terrorist Operation / Joint Forces Operation data, the share of limb injuries in the structure of modern combat trauma has been recorded as 56.3-70.1

% [1, 2]. The leading cause of limb injuries is explosive trauma (78.4 %), which results in traumatic amputations in 4.9-8.0 % of cases [3, 4]. Modern combat trauma significantly differs from peacetime injuries and from previous military campaigns due to high-energy traumatic factors, which leads to significant tissue damage with secondary infection [5, 6].

The analysis of open literature sources indicates that limb amputation due to combat trauma has significant differences from amputations of other etiologies. These differences include the following: younger individuals are more frequently injured, there is a high risk of post-traumatic stress disorder, and the trauma is often polytrauma or a combined injury [7, 8, 9, 10, 11]. The consequences of combat limb injuries, which are connected with amputations, significantly affect the health and quality of life of military personnel [12, 13, 14]. The mortality rate for gunshot traumatic limb amputations ranges from 12.8 to 25.6% [15].

**The aim and objectives of the research:** Assessment of the complications of traumatic lower limb amputations due to gunshot wounds.

**Results and discussion.** The results of treatment of 30 injured men with traumatic lower limbs amputations were retrospectively investigated. The causes of amputations were: explosive trauma in 19 cases, damage to major vessels in 8 cases, and tourniquet syndrome in 3 cases. All the injured were male. The age varied from: up to 30 years-old – 16 patients, up to 40 years-old – 11 patients, and up to 60 years-old – 3 patients. In 2 injured men had traumatic amputations of both lower limbs, and 1 injured had an amputation of a lower limb and an upper limb. The primary operations were performed within the following time: up to 2 hours in 5 cases, up to 6 hours in 12 cases, up to 12 hours in 10 cases, and up to 24 hours in 3 cases.

At the prehospital stage, primary surgical interventions included: primary surgical debridement of gunshot wounds and primary limb amputation, which were performed after stabilizing measures. Amputation was performed using the guillotine method. Cutting off all limb tissues was performed at one level without formation a stump. At the hospital stage, medical care was provided in full scope and included: conducting the necessary instrumental examinations (X-ray, ultrasound examinations), performing repeated surgical interventions (secondary limb amputation and reamputation), and conservative treatment (wound dressings, Vacuum-assisted therapy and rehabilitation).

Early complications were observed in 8 patients, including: bleeding – 2 cases, wound suppuration – 4 cases, and stump soft tissue necrosis – 2 cases. Post-surgical bleeding occurred during long course of the wound process and insufficient previous surgical debridement of wounds, which required urgent surgical interventions to achieve definitive hemostasis. Secondary surgical debridement with VAC-system application was performed for a wound suppuration of the stump. The optimal time for vacuum-dressing change was from 1 to 3 days. The average duration of treatment was from 7 to 15 days. Due to the use of closed drainage VAC-system, there was faster formation of granulation tissue and marginal epithelialization, which accelerated the

onset of the second phase of the wound healing process by 2-3 days. The effectiveness of the VAC-system had a positive impact not only on the wound healing process but also on the reduction of systemic intoxication symptoms (reduction in leukocytosis on Day 7). Reamputation was performed at a level with the main blood supply preserved during the formation of stump soft tissue necrosis.

Late complications were diagnosed in 22 patients, including: allergic dermatitis – 5 cases, benign skin formations – 4 cases, hypertrophic keloid scars – 3 cases, trophic ulcers – 7 cases, and osteophytes – 3 cases. For the treatment of allergic dermatitis, antihistamine drugs were used to reduce the allergic reactions. In difficult cases corticosteroid ointments were applied for no longer than 10 days, as prolonged use of corticosteroid drugs may lead to atrophy of the stump skin. The benign skin formations of the stump should be diagnosed early, as they can undergo malignant transformation. The treatment of hyperkeratosis and callosity involved proper prosthetic fitting. The presence of papillomas on the stump skin required their surgical excision. The formation of hypertrophic keloid scars led to restricted mobility and caused pain. In such cases, cryotherapy, laser therapy, massage or scar stretching with the help of special devices were used. Trophic ulcers in 3 cases required autodermatoplasty. Usually, after taking free skin grafts with a thickness of 3-5 mm, they were transferred to the trophic ulcers. In 4 patients, the conservative treatment (wound dressings, physiotherapy) was used for trophic ulcers. Osteophytes of the stump caused pain, restricted movement and complicated prosthesis wearing. Osteophytes were removed surgically.

To prevent late complications, it is necessary to wear the prosthesis from the first day gradually (20 minutes, several times a day). It is necessary to monitor for hyperemia in the place where a prosthetic socket contacts the skin. If the hyperaemia begins to decrease, the duration of prosthesis use can then be increased to 40-60 minutes at a time. Thus, increasing the period of wearing and conducting regular examinations of the stump, gradually switch to regular wearing of the prosthesis.

**Conclusions:** The most common cause of traumatic lower limbs amputation is explosive trauma. Early complications of traumatic lower limbs amputation require repeated surgical interventions. To prevent late complications, it is necessary to adhere to proper stump skin care and gradually increasing the period of prosthesis use.

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