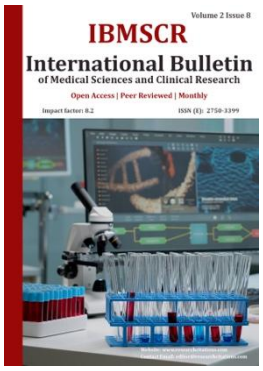


# SOME ASPECTS OF TREATMENT TACTICS FOR FRACTURES OF LONG BONES OF THE LOWER EXTREMITIES

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**Abstract**

The work analyzed the treatment of 98 patients with polytrauma severity ≥16 points according to R-AIS-NISS, which included open III (A, B, C) type according to GustiloAndersen and closed multiple fractures of the long bones of the lower extremities, which were divided into 3 groups depending on the applied algorithm for providing medical care. The mortality rate and the number of infectious complications were studied when using 3 medical care algorithms for injury severity ≥16 points according to R-AIS-NISS. The result of the analysis was the development of an algorithm for providing medical care, the implementation of which made it possible to reduce the mortality rate and the number of infectious complications in patients with polytrauma, part of which were open type III (A, B, C) and closed multiple fractures of the long bones of the lower extremities.

**Keywords:** polytrauma, multiple fractures of the long bones of the lower extremities, combined trauma, dynamic damage control.

**Introduction** According to leading experts [1, 3, 5], in the process of choosing a scheme for the provision of medical care to victims with open and closed multiple fractures of the long bones of the lower extremities (MPFLB) in the conditions of polytrauma, it is necessary to focus on the severity injuries received (SIR), determining the degree of their threat to life (representing an immediate threat to life; severe, but not directly life-threatening; mild, not significantly affecting the homeostasis system, etc. [5]), shockogenicity multiple fractures of the long bones of the lower extremities and features of open fractures (FOF). If there is no threat to the life of the victim caused by hypovolemic syndrome (shock) developed as a result of damage to the musculoskeletal system (MS) and/or consequences of damage to other anatomical systems [1], then Immediately after hospitalization of a victim with multiple

fractures of the long bones of the lower extremities, it is necessary to perform emergency surgical interventions: – temporary or final reduction and fixation of closed and open fractures using submersible or extrafocal osteosynthesis technologies, and it is assumed that skeletal traction will be applied during the preoperative preparation and detailed examination of the victim; the advantages and disadvantages of these treatment methods are the subject of discussions currently [1, 3]; – primary surgical treatment (PST) of an open fracture wound, taking into account the characteristics of an open fracture. MaterialsAndMethods If the victim is diagnosed with “polytrauma” and multiple fractures of the long bones of the lower extremities are found, which contributed to the development of hypovolemic syndrome (shock), as well as damage to other anatomical systems that pose an immediate threat to life [4], then most specialists [1]

consider dynamic damage control to be indicated, suggesting staged surgical treatment taking into account changes in the severity of the condition. At the first stage of surgical

treatment of multiple fractures of the long bones of the lower extremities with dynamic damage control, surgical interventions are performed aimed at relieving shock - surgical stabilization of fractures. ResultsAndDiscussion To develop rational treatment tactics for patients with open and closed multiple fractures of the long bones of the lower extremities, taking into account the severity and characteristics of the injuries received, we conducted a study based on a retrospective (76 people) and prospective (22 people) analysis results of treatment of 98 patients with fractures of two or more segments of the long bones of the lower extremities, among which at least one fracture was open. The condition for inclusion in the study was that patients had: – open and closed multiple fractures of the long bones of the lower extremities, possibly in combination with any other injuries: with fractures and ruptures of the pelvic ring – 18 (18.36%) patients; with multiple fractures of the bones of the upper and lower extremities - 26 (26.53%), spinal fractures - 4 (4.08%), traumatic brain injury - 40 (40.81%), chest injury - 16 (16, 32%), abdomen - 12 (12.24%); – age from 20 to 50 years (average age 37.9 years),

– absence of pronounced concomitant pathology that could distort the overall picture of the traumatic disease, – uniformity of diagnostic and treatment technologies used in different hospitals. To develop a rational treatment system for multiple fractures of the long bones of the lower extremities, the study was divided into 3 parts. In the first part, in 98 victims, the mortality rate for injuries of varying severity and the number of infectious complications that developed in various types of open multiple fractures of the long bones of the lower extremities were studied, which made it possible to form a group of patients with worse treatment results, for whom the medical care system needed in improvement. To systematize open fractures, we used the Gustilo-Andersen classification [2] due to the fact that it most accurately takes into account the characteristics of these injuries. The severity of the injury was assessed using the R-AIS-NISS system in points [3]: – injuries assessed as ≤15 points were characterized as non-severe multiple or combined injuries; – injuries assessed as ≥16 points were defined as polytrauma (severe or extremely severe combined or multiple trauma, accompanied by acute impairment of vital functions, requiring resuscitation and surgical measures and intensive care in a specialized multidisciplinary hospital) [3].

Table 1 Number and % ratio of patients with open fractures of one and two limb segments Total patients – 98 Open fractures of 4 limb segments Open fractures of 3 limb segments Open fractures of 2 limb segments

| Total patients – 98 | | | | |
|---|---|---|---|---|
| Open fractures of 4 limb segments | Open fractures of 4 limb segments | Open fractures of 4 limb segments | Open fractures of 4 limb segments | Open fractures of 4 limb segments |
| 0 2 (1,49±0,4%) 34 (25,37±2,4%) | 0 2 (1,49±0,4%) 34 (25,37±2,4%) | 0 2 (1,49±0,4%) 34 (25,37±2,4%) | 0 2 (1,49±0,4%) 34 (25,37±2,4%) | |
| In total, 98 patients had 251 fractures | Open – 134 (53,38±2,8%) | | | 117 (46,61±2,7 %) |

The results obtained indicate that the use of the developed system of medical care for injury severity ≥16 points according to the RAIS-NISS system made it possible to reduce the

mortality rate by 9.71±1.4% and reduce the number of infectious complications by 29.71±2.3% compared with other treatment systems (P=0.04). Conclusion The results obtained during the study allowed us to come to the conclusion that for victims with polytrauma, the elements of which are open type III (A, B, C) and closed multiple fractures of the long bones of the lower extremities, in the presence of injuries that pose a direct threat - for life, surgical interventions at the stages of surgical treatment of polytrauma with dynamic damage control should include elements of primary surgical treatment of open fractures that are objectively justified for each stage. In the proposed system of providing medical care to victims with multiple fractures of the long bones of the lower extremities, the criterion for choosing an algorithm for providing care should be an accurate assessment of the severity of the injuries received and the degree of their threat to life, as well as the characteristics of open fractures. This approach allows one to eliminate subjectivity in decision-making, choose the optimal treatment tactics, and avoid tactical mistakes even for an inexperienced surgeon. According to various authors [1, 3, 5], the mortality rate in such victims is 17–19%, the number of infectious complications reaches 20%, while in patients of the main study group, who were treated using the proposed regimen, the mortality rate was 14.29±2.9%, and infectious complications were noted in 14.29±1.6% of observations, which allows us to consider the proposed treatment system more effective.

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