



## **TREATMENT OF INJURIES TO THE HAND IN PATIENTS WITH MULTIPLE AND ASSOCIATED INJURY**

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<b>Received:</b> February 4 <sup>th</sup> 2022 <b>Accepted:</b> March 4 <sup>th</sup> 2022 <b>Published:</b> April 19 <sup>th</sup> 2022	<p>In this article to summarize the data on the features of hand injuries in patients with polytrauma. The rate of the hand and wrist injuries is about 25 % among patients with poly trauma. Damages of the hand in polytrauma are commonly featured by severe soft tissue injury and multiple fractures of the bones due to high energy of a traumatic agent in the road accidents or cata-trauma.</p> <p>Treatment of life-threatening injuries is a primary objective in patients with polytrauma, whereas treatment of "small fractures" is carried out after all the others. Late diagnostics and untimely initiation of treatment can cause the hand defunctionalization.</p>

**Keywords:** Polytrauma; multiple trauma; associated injury; hand injuries, diagnosis, patient, treatment, multiple trauma, anatomic-functional, post-rehabilitation.

### **MATERIALS AND METHODS:**

Diagnosis of the hand injuries should be full and performed as early as possible. It is necessary to examine this patient carefully at the admission and after 24 hours from admission to identify missed injuries.

### **RESULTS:**

Early diagnosis, early treatment and rehabilitation allow saving the function of the hand in patients with polytrauma. Participation of hand surgery specialists in treatment of such victims from the time of their admission can improve the quality of care.

The problem of treatment of brush injuries in the victims with multiple and combined injuries is not currently found wide coverage in literature. In our study, we found only a few articles on this topic. The epidemiology, nature, outcome of such injuries remain unknown. The literary data available are contradictory [1]. The specificities of the hand as a complex anatomic-functional unit require a specialized approach to diagnosis, treatment and post-rehabilitation [2-5].

At the same time, more powerful and high-speed vehicles are emerging every year, extreme sports are evolving, leading to an increase in the number of victims with high-energy multiple and combined injuries, which often suffer brush damage [2]. These damage has a number of features:

- They are characterized by severe trauma to soft tissue and multiple bone fractures [6, 7];

- Most of them are highly energy trauma (HET - high energy trauma); - The diagnostic of these damages is hampered by life-threatening damage, the need for resuscitation activities, often unconscious condition of the patient, extended by sedation under the conditions of the ORIT;

- They do not have a significant impact on the forecast for the victim's life, nor play a significant role in the cascade of pathophysiological processes of traumatic disease [8];

- They have difficulty in treating and the need to involve surgical surgery and to be in the O.R.

In the remote period, functional disorders of the hand begin to play a leading role in reducing the quality of life and the ability of the sick to work and self-care.

In some cases, poor treatment results are related to defects of damage, tactics or operational intervention techniques [9]. Even after successful primary or delayed reconstruction and rehabilitation operations, injured patients remain a relatively high percentage (up to 90 per cent) of unsatisfactory results due to insufficient or inadequate rehabilitation in the post-op period [1, 9-12]. The aim is to summarize the features of the hand damage in the civilian victims.

EPIDEMIOLOGY according to a number of authors, hand injuries to victims with multiple and combined injuries occur between 3.5 and 25% [1, 6]. This wide variation can be explained by the fact that research is retrospective; they are limited to one treatment institution or a database. Plus, the hand is



often the fractures of the remote section of the forearm bones.

Adrian S. et al. analysed their hospital data and found that 26-67 per cent of 386 patients had paint injuries. Of these, half were fractured by radius distal. Thus, the frequency of the brush injury is not recorded in the forearm distance in these two studies are close. The remaining indicators are also similar: the average age of 36.4, ISS high average ball 28.3, indicating high energy trauma [13].

According to M. Schaedel-Hoepfner [7], patients with politically fractured brush fractures meet between 2 and 16% of cases, soft tissue damage - 2-11%, amputations and severe damage to soft tissue are rare 0.2-3%. Among the fractures of the bones, the wrist fractures are 29%, the metacarpals are 48%, the fingerflank is 24% [1].

These damage is often not given due attention during the emergency phases. Diagnostics In cases of open fractures, extensive wounds and trauma amputations of the brushes and fingers are obvious, and their treatment begins as soon as possible. As for closed damage, their early diagnostic is often difficult, which ultimately leads to late start of treatment. The risk of late diagnosis of paint injuries in patients with a politician reaches 50% [14]. The risk of delayed diagnostic of brush injuries is twice as high as those of patients with less severe damage [14].

The victims with the politrá are treating life-threatening damage [15-19], while the brush injuries are often missed. The diagnostic of the brush injuries in the politan victims begins with a thorough examination. The survey starts with determining the viability of the entire brush and then each finger separately. The viability of tissue is judged by colour, the degree of blood of damaged sites and temperature. The brush has a well-expressed network of blood vessels and nerves. As a result, the brushes cause severe pain and express bleeding, so the brush is often placed on the limb quite often in the trauma of the brush. It is therefore necessary to remember that the rigging on the forearm may significantly affect the sensitive and engine functions of the brush [3].

It is always necessary to take into account the energy of the injury -- patients after the accident, even with minimal changes during the clinical examination, possibly severe brush injuries (brush dislocations, multi-fractures of the radius distal metapiphys and others) [7, 20]. Patients unconscious should be particularly thorough, as credible signs of fractures of the brush are found in 20-25% of cases, while the likely proportion is 70-75% [4].

Thus, the slightest swelling, asymmetry and deformation in comparison with the healthy side must be taken into account. The victims are tested with the engine functions of the brush and fingers, the palm and finger branches of the radial, middle and ulna nerves. The victim's unconscious diagnostic of nerve damage, tendons and bone fractures are often delayed. It is also necessary to have X-ray studies in at least two projections, direct and side (or 3/4 of the brush projections).

If the treatment of the brush damage is not due to time, it may later result in the loss of the brush function. To make an objective decision on a case-by-case basis, a proper assessment of gravity is needed trauma and the victim's condition. To this end, many scales have been developed, most frequently being used by GCS (Glasgow Coma Scale), ISS (Injury Severity Score), APACHE (acute physiology and chronic health evaluation) and others.

The following information is available: Cutting the brush injuries requires special attention and accuracy of the fracture reposition at any level of damage [4].

Since the patient has been admitted to the hospital, the life of the victim has been saving the victim's life, as accurate and early diagnostic of CMT, damage to the limb, pelvis, chest and abdominal bodies. A large number of specialists are involved in the provision of assistance to victims of the political rabbis [6, 15]. The main challenges facing the team of specialists at this stage are to examine and interpret these clinical-tool studies, assess the gravity of the politics, state and compensatory capabilities of the victim, select time and permissible trauma operations, or the need to "control the gravity of the damage", to harmonize with the phases of the injury and the patterns of the injury process and the patterns of the injury closure process, time fractures and methods of final stabilization of fractures. By interpreting the results of clinical and X-ray tests, the trauma surgeon or brush surgeon must, by taking a command approach to treatment for victims of the political ram, choose the best time and way of providing assistance as early as possible, based on the principles of life preservation, preservation and restoration of function.

The provision of assistance to victims with a political will is regulated by the ATLS Protocol [19.20]. The ATLS system developed in 1978 Dr. Dr. McDolce. Jim Styner. The ATLS system (Advanced trauma life support) is based on a consistent transition to diagnostics and treatment from the most dangerous, life-threatening injuries to less dangerous [121].

The fundamental rule of assistance under the ATLS protocols is the Golden Hour rule, which is



consistent with the single protocol, with first aid immediately at the scene to specialized surgical care in the hospital [11].

As a result, the chance of the patient's death is reduced because the doctor, starting treatment with less life-threatening damage, failed to detect and begin treatment of more dangerous. Due to the continuing high levels of lethality in patients in unstable, border and extremely severe condition, the concept of damage control orthopaedics was developed in 1993. The essence of it is the phased treatment of damage, from life-saving, minimal trauma operations in the first hours after injury to low-invasive osteosynthesis after complete stabilization of hemodynamic and other homeostasis. This concept has reduced the surgical second hit, which facilitates the flow of syndrome inflammatory response (SSWS), multiple organ dysfunction syndrome (MODS), polyorgan deficiency syndrome (MOF). Significant reduction in rapid intervention time, minimizing blood loss, use of external fixing equipment reduces early and late lethality from combined injuries and their consequences [6].

The DCO concept consists of three stages. The first phase is in the early temporary stabilization of unstable fractures and blood loss control. The second carries out resuscitation activities in the intensive care unit aimed at stabilizing the victims (CCC replenishment, coagulopathy correction, sustaining hemodynamics, acidosis correction). In phase three, the delayed final operational treatment of all damage suffered [5-7, 15, 16].

The introduction of ETC and DCO concepts inevitably led to a variety of operational intervention classifications, depending on the severity of the injuries they suffered.

At present, there is no single classification of operational interventions in time for politicians, the same terms correspond to different times of traumatic disease. Treatment of damage to different structures of the hand has its own features. The soft tissue injuries caused by pressure, injury and scalped damage to politically affected persons are 3-11% [6]. In the first phase, after mechanical cleansing, radical primary surgical treatment of wounds is performed: all non-viable tissues are removed, the wounds are washed by antiseptic solutions, vacuums are vacuumed to avoid local and generalized infectious complications. Trauma or hand surgeons must strike a balance between the radical removal of all unsustainable tissues and the preservation of function. All subsequent reconstruction interventions must be postponed and implemented not before the 4th day and later from the hospitalization to avoid surgical second hit [20].

This principle applies to nerve injuries to victims with multiple and combined injuries. Nerves are tested by studying pain sensitivity according to the radial, ulna and middle nerves on the hand. The advantages of primary and primary-deferred stitches over the secondary were proved in a number of animal studies [3].

The nerve stitch on the fourth day after the injury is still considered primary. However, patients with open fractures and dislocations, severe soft tissue injuries are produced by the secondary nerve stitches after the wound has been cleaned and stabilized. Fractures and dislocations of the wrist and hand in the political trauma are most often diagnosed with late start of treatment [6, 13, 14].

One should say, one week after the tissue injury, the tendons become dense, rigid. A closed reposition is difficult and often unsuccessful [3, 4].

Closed or open reposition and internal fixation are recommended when fractures and dislocations of distal metaphysis of radius, wrist bones and metacarpal bones with significant removal of the separation. The preference of external fixing equipment is preferable to those affected by the political trauma. The treatment of these injuries must be postponed to patients in a border and unstable state. They are also subject to a private or open reposition and internal fixation. According to several authors, with well-performed AFS, remote functional results are similar to those after anatomic reposition and internal fixing with matches or plates. Consequently, in some cases, the FNL may be fixed in the primary and final operational intervention in the affected wrists and wrist dislocations. Speaking of damage to the tendons of victims with a politician, attention should be paid to their diagnostic. Patients are diagnosed with tendon damage based on the loss of motor functions. The main joints of the hand, due to the effects of worm and bone muscles, are bent even when both bends are damaged, so each finger joints shall be examined separately [3].

The victim's unconscious with significant damage to soft tissue, expressed by swelling, fractured bone fractures, diagnosing the tendon damage is extremely difficult. The restoration of tendons may be primary, deferred primary and secondary, depending on the severity of the injuries suffered and the severity of the victim. Traumatic amputations and disorders of politically affected persons are 0.2-3% [5].

Changing skin colour, turgor, temperature, lack of blood supply is sufficient clinical signs to determine perfusion status. Its definition may be difficult for victims with express hypotension. Rehabilitation and revascularization are only performed in patients stable.



### CONCLUSION:

Patients with multiple and combined injury require detailed and timely diagnosis of brush damage, early treatment and post-rehabilitation. This will improve the treatment, reduce the time of stay in hospital, temporary incapacity and disability rates. Involving such victims of brush surgery from the time they entered the hospital will improve the quality of the assistance provided. *Traumatology and Orthopedics of Russia*. 2008; 2(48): 81.

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