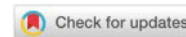


DAMAGE CONTROL IN ORTHOPEDICS

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Abstract: Introduction: DAMAGE CONTROL - in orthopedic surgery and traumatology, it is indicated for fresh fractures, especially for trauma with open bone fractures. In all these fresh fractures, hemodynamic instability of the body occurs. In these cases, a minimally invasive procedure is recommended, which initially aims to temporarily stabilize the fractures and control bleeding

Material and methods: In our work, we will present the official literature that deals with the issue of damage control in orthopedics.

Discussion: One of the leading causes of death in people under 40 is polytrauma. Fractures of the diaphysis of the tibia, femur, and pelvis are the most common fractures that are stabilized using external fixation. Bilateral fractures of the femoral diaphysis are associated with a poor prognosis in terms of mortality and fat embolism syndrome. Hemodynamically stable patients should always undergo definitive fracture fixation. Any prolonged intervention in hemodynamically unstable patients worsens the favorable outcome. Then the immune response can be triggered and increased, which is identified with the clinical condition "Second trauma". Therefore, these patients should be immediately subjected to DAMAGE CONTROL with temporary stabilization and then delayed definitive fixation for a period of 5-10 days from damage control, i.e. in the second act. Orthopedic surgeons should be very careful and recognize the triangle of death - acidosis, hypothermia and coagulopathy, which are interconnected and eventually become irreversible and lead to death as the final outcome. Damage control surgery in orthopedics includes three stages: the first stage of treatment involves controlling bleeding, reducing contamination, and achieving temporary fracture fixation. The time in which all this is done should be as short as 1-2 hours. The second phase involves the stabilization of vital parameters in the ICU as well as the reanimation of the child with the prescription of the necessary therapy as well as blood replacement

The aim: The aim of our work is to demonstrate the outcome and feasibility of damage control in orthopedic surgery for both adults and children with multiple limb injuries and polytraumatized patients

Conclusion: Polytrauma is a condition of the body that requires immediate action and a special approach because the patient's life is at risk in a high percentage. The principles used to manage patients with multiple injuries including head, lower leg. Early fracture fixation led to earlier mobilization of patients and thus And reduced the percentage of complications, wound infections as well as reducing treatment costs. DAMAGE CONTROL is not only used in traumatized adult patients. It is also necessary to do it in children's patients.

Keywords: damage, control, polytrauma, orthopedics

Field: Medicine research

INTRODUCTION

DAMAGE CONTROL - in orthopedic surgery, it is useful for fresh fractures, especially for trauma with open bone fractures (1). In all these fresh fractures, hemodynamic instability of the body occurs. In these cases, a minimally invasive procedure is recommended, which initially aims to stabilize the bones fragments and control bleeding. Therefore, DAMAGE CONTROL becomes a priority in the orthopedic treatment of fresh fractures. The concept is different depending on the degree of injury and hemodynamic instability. It is absolutely indicated in patients with bone fractures of the extremities and/or pelvis. As a type of operation in DAMAGE CONTROL in orthopedics, an external fixator is used. (2-6). The severity of injuries should be assessed based on ISS and/or NEW ISS (NISS) scores, in order to assess which procedure to use as orthopedic treatment or only for damage control as a form of temporary treatment (7-8). With patients with a score of less than 36, definite early stabilization of the fracture is indicated. Patients with a higher NISS score should undergo damage control in orthopedics (9-10). After the operation, the patient should be transferred to the intensive care unit, where after additional analyzes and stabilization of the general condition, further treatment will be decided.

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MATERIAL AND METHODS

In our work, we will present the official literature that deals with the issue of damage control in orthopedics. All the mentioned articles respect modern orthopedic postulates and very closely connect us with the principles and importance of damage control.

DISCUSSION

In people younger than 40 years of age, one of the main causes of death is polytrauma (11,12). patients who are between 5-30 years old, polytrauma most often occurs as a result of a traffic accident. Fractures of long bones and pelvis are present in 55% of patients with polytrauma on an annual basis, with a frequency of 80-100 patients. Unfortunately, as a result of mass injuries to the bones of the lower limb, 12% of patients had amputation. Of all fractures resulting from a traffic accident, fractures of the body of the femur and tibia are most often stabilized with external fixation. Bilateral femoral fractures are always associated with high mortality and fat embolism syndrome.

The Berlin definition gives us data that polytrauma is made up of the disruption of three or more systems in the human organism, or sometimes we can take into account two anatomical regions (14). In such cases, the hemodynamic status of the patient should always be monitored and the degree of polytrauma assessed. The most widespread system is the ISS proposed by Baker. ISS includes 6 systems: head (including cervical spine), face, thorax (including thorax), abdomen (including lumbar spine), extremities (including pelvis) and of course external skin injuries. We present the final grade and severity of the injury through the AIS score. High-energy forces can cause major injuries. Then the body's defense systems, composed of cytokines, macrophages and other inflammatory cells, are activated. All this happens as a consequence of the activation of interleukin (IL8) as well as other components of the inflammatory response that leads to SIRS, namely C5a and C3a (15,16). The SIRS response can take several hours or days depending on the severity of the injury.(17). Also, markers of the immune response as well as inflammatory reactants reach their peak in the first 24-72 hours after the trauma, which is why those first 73 hours are the most critical for the patient's life. Immune response markers are divided into: 1) acute phase reactants, 2) mediator activity marker, 3) cellular activity marker. In orthopedic traumatology, the most important are TNF- α , IL-1, IL-10. Previous experiences as well as a review of world literature show that early stabilization of fractures increases patient survival (18-21).

Hemodynamically stable patients should always undergo definitive fracture fixation. Any prolonged intervention in hemodynamically unstable patients worsens the favorable outcome. Then the immune response can be triggered and increased, which is identified with the clinical condition "Second trauma". Therefore, these patients should be immediately subjected to DAMAGE CONTROL with temporary stabilization and then delayed definitive fixation for a period of 5-10 days from damage control, i.e. in the second act (22-24). For those patients who are on the verge of doing damage control or a definitive method of treatment, the great experience of the orthopedist, as well as the appropriate material at their disposal, is secondary. Polytrauma is a condition of the body that requires urgent action and a special approach because the patient's life is at risk in a high percentage. The principles used to manage patients with multiple injuries including head, thoracic, abdominal and pelvic injuries require special attention. The treatment of such severe orthopedic patients has changed over the decades. Fracture traction was previously used as a form of stabilization, but the percentage of complications such as: muscle atrophy, lung embolism, lung infections... Bone and co-authors conducted a prospective study with 178 patients who were divided into two groups: a) Early fixation (24h), b) delayed (48h) fixation of femur fracture.. Early fixation of the fracture led to earlier mobilization of patients, thereby reducing the percentage of complications, wound infections, and reducing treatment costs. DAMAGE CONTROL is not only used in traumatized adult patients. It is also necessary to do it in children's patients, both in severe trauma and sports injuries (25-28). First, it is necessary to stabilize children with conditions that lead to large blood losses, as well as patients with a high risk of infection. The second step involves resuscitation in the pediatric intensive care unit. And the third step involves a definitive method of fracture stabilization and tissue reconstruction. Orthopedic surgeons should be very careful and recognize the triangle of death - acidosis, hypothermia and coagulopathy, which are interconnected and eventually become irreversible and lead to death as the final outcome. Damage control surgery in orthopedics includes three stages: the first stage of treatment involves controlling bleeding, reducing contamination, and achieving temporary fracture fixation. The time in which all this is done should be as short as 1-2 hours. The second phase involves the stabilization of vital parameters in the ICU as well as the reanimation of the child with the

prescription of the necessary therapy as well as blood replacement. And of course, when everything is normalized, the decision is made for the third phase, which implies a definitive method of treatment, which may also include the use of an external fixator (29,30).

THE AIM

The aim of our work is to demonstrate the outcome and feasibility of damage control in orthopedic surgery for both adults and children with multiple limb injuries and polytraumatized patients (31).

CONCLUSION

Polytrauma is a condition of the body that requires immediate action and a special approach because the patient's life is at risk in a high percentage. The principles used to manage patients with multiple injuries including head, lower leg, thoracic, abdominal, and pelvic injuries require special attention. The treatment of such severe orthopedic patients has changed over the decades. Earlier, fracture traction was used as a form of stabilization, but the percentage of occurrence of complications such as: muscle atrophy, lung embolism, lung infections was increasing. Bone and co-authors performed a prospective study with 178 patients who were divided into two groups: a) early fixation (24h), b) delayed (48h) fixation of femur fractures.. Early fracture fixation led to earlier mobilization of patients and thus And reduced the percentage of complications, wound infections as well as reducing treatment costs. DAMAGE CONTROL is not only used in traumatized adult patients. It is also necessary to do it in children's patients.

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