

Evidence of the Effectiveness of a Step-By-Step Surgical Method in Severe Liver Damage with Combined Trauma

Umedov Khushvaqt Alisherovich

Teacher of the Department of Surgical Diseases №. 2. Samarkand Medical University.
Samarkand, Uzbekistan, Samarkand branch of RNCCEMP

Abstract: The authors proposed active surgical tactics as "damage control" in traumatic liver injuries. The "damage control" method has been used in the SFRSCEMP since 2013 as the only method of saving the lives of patients with traumatic liver injuries. During 2013–2023, 140 patients with liver injury were operated on in the emergency surgery departments of the SFRNCEMMP. Of these, 19 (14.61%) patients with severe liver injuries of IV and V degrees of damage according to E.Moore. The effectiveness of multi-stage tactics was assessed by the level of mortality and the number of purulent-septic complications. The results of surgical treatment of 19 patients with massive liver damage, aged 17 to 50 years, were studied. The average age is 26 years. Of these, 11 men, 8 women. The average assessment of the severity of injuries on a scale ISS was 34 points (17-76), according to E.Moore IV and V degrees of injury. The mean blood loss was 2800 ml (1750-3850 ml). All patients underwent a multistage laparotomy with gauze (film) tamponade, the average number of operations per 1 person was 2.7 (2-5), suturing of the liver wound with tamponade (13), extensive hepatotomy and ligation of blood vessels (3), atypical resection (2), stitching of large main vessels with taponade (1). The average bed/day in the intensive care unit is 13 (3-16) and the average bed/day in the clinic is 25 (3-28). Mortality was 26.3% (5 out of 19), mainly purulent-septic complications and multiple organ failure. The use of the "damage control" technique helped to reduce the incidence of mortality from acute pathology of the abdominal organs by 26.3%.

Keywords: closed abdominal injury, liver injury, damage control.

Introduction

Severe liver trauma poses significant risks and demands immediate medical intervention. The "damage control" surgical approach has emerged as an effective strategy in the management of such injuries. This paper aims to analyze the effectiveness of this method in patients with severe liver trauma classified as grade IV and V. Data from surgeries performed between 2013 and 2023 in the emergency surgery departments of Samarkand region are examined, with a focus on reducing mortality rates and improving treatment outcomes.

Relevance. Traumatic injuries of the liver according to the severity of the course, the complexity of diagnosis and treatment, the high mortality rate, are considered the most dangerous among injuries of the abdominal organs. The frequency of liver damage in closed abdominal trauma ranges from 20 to 46.9%, with penetrating injuries - from 57% to 86.4% of cases.

According to the literature, postoperative mortality in blunt abdominal trauma with liver damage is 30.4%, in stab-cut wounds of the organ - from 4 to 10.5%, with combined trauma, 39.3% of victims die. With a modern combined injury, the victims, in whom the severity of injuries on a

scale ISS corresponds to IV and V degrees (according to E. Moore, 1986), characterized by high mortality, reaching 40-80%. High mortality rates are associated with a combination of injuries, shock, blood loss, aggravated in the early postoperative period by the development of "abdominal compartment syndrome", and subsequently - purulent-septic complications.

The traditional surgical tactics for isolated and combined injuries include laparotomy with correction of existing injuries to the abdominal organs and chest cavities. However, with massive damage to internal organs, often combined with damage to large vessels, the complete correction of all damage takes a long time, which affects the outcome of treatment. Initially, the "damage control" strategy (M. Rotondo 1993) was used for the surgical treatment of the wounded with polytrauma. This technique consisted of three stages:

The first is urgent, immediate surgery to stop active bleeding and prevent infection of the abdominal cavity. The second is the implementation of cumulative intensive anti-shock therapy in the presence of an intensive care unit for the fastest rehabilitation of the body. The third - within 48-72 hours after the injury, the final decision on surgical treatment. Purpose of the study. evaluate the effectiveness of the method "damage control" for severe liver damage.

Materials and methods. During 2013–2023, 140 patients with liver injury were operated on in the emergency surgery departments of the SFRNCEMMP. Of these, 19 (14.61%) patients with severe liver injuries IV and V degrees of damage according to E. Moore. The effectiveness of multi-stage tactics was assessed by the level of mortality and the number of purulent-septic complications. The results of surgical treatment of 19 patients with massive liver damage, aged 17 to 50 years, were studied. The average age is 26 years. Of these, 11 men, 8 women. The average assessment of the severity of injuries on a scale ISS was 34 points (17-76), according to E. Moore IV and V degrees of injury. The mean blood loss was 2800 ml (1750-3850 ml). All patients underwent a multistage laparotomy with gauze (film) tamponade, the average number of operations per 1 person was 2.7 (2-5), suturing of the liver wound with tamponade (13), extensive hepatotomy and ligation of blood vessels (3), atypical resection (2), stitching of large main vessels with taponade (1). The average bed/day in the intensive care unit is 13 (3-16) and the average bed/day in the clinic is 25 (3-28). Mortality was 26.3% (5 out of 19), mainly purulent-septic complications and multiple organ failure. In addition, a correlation study was carried out: 41 patients with acute abdominal pathology treated according to the system "damage control" (interrupted operation), 30 patients (control group, similar in terms of the main nosology, time of hospitalization, concomitant nosology, age) were carried out using the "early total care" method (simultaneous performance of the full volume of surgical intervention, regardless of the type of nosology and primary patient's condition).

To understand the severity of the patient and the legitimacy of managing patients in the "damage control" a scale was designed (each indicator was estimated from 1 to 4 points) for the patient's nosology:

< 9 points - there are no indications for the application of the technique "damage control", 10-16 points - unambiguous indications for "damage control".

Empiricism in decision making is acceptable for adjacent values of the algorithm 8-9 points.

In the scale of severity, these indicators were taken into account: the duration of the disease, the source of peritonitis, the type of inflammatory and destructive processes in the abdominal cavity, withIn mesenteric-vascular thrombosis, the degree of intestinal necrosis was taken into account, in acute intestinal obstruction - the origin of obstruction, in circumstances of infected pancreonecrosis - generalization and location of the process, the presence of shock in polytrauma with damage to the abdominal organs, etc. Undoubtedly, an important and decisive moment of this tactic is the implementation of not a single surgical intervention, but 2 or more according to indications.

Results and discussion. The mortality rate in the main group of patients with the damage control method was 19.5% (8 out of 41 patients died). This coefficient in the comparative group with the "early total care" method was 53.3% (16 out of 30 patients died). The study of the first steps of this tactic and the final data obtained were a predetermining factor for creating our own scale in order to take into account operational risk, as well as further prognosis of the disease based on the physiological state of the patient. Was taken into account: the age of the patient, the value of blood pressure (mm Hg.st), heart rate (bpm), Hb (hemoglobin) g / l, Potassium (mmol / l), Sodium (mmol / l), urea (mmol / l), leukocytes, ECG, cardiovascular and respiratory systems, temperature and acidity. All indicators were evaluated in points (from 1 to 4 depending on the degree of their deviation):

1-10 - compensated state (prognosis for life is favorable)

11-29 -subcompensated state (boundary state)

30-44 - decompensated state (prognosis for life is unfavorable)

The proposed algorithm, which is based on numbering criteria, excludes empiricism when choosing a treatment method for severe liver injuries in unstable patients at risk of developing coagulopathy and multiple organ failure, makes it possible to determine the indications for damage control with high accuracy, use this technique at the right time, recognize and prevent acceptable complications in advance, and predict the outcome of the disease. The strategy that has been proposed above combines the strengths of programmed relaparotomy and the standard damage control technique for injuries. Staged surgical treatment provides a chance to fully use the modernized resuscitation post-syndromic treatment, as well as prosthetics of organ function in order to combat the systemic inflammatory response, which is not amenable to drug and physiotherapeutic stimulation by intestinal paresis. The application of this strategy reduced mortality from 67.3% to 21.4%.

Conclusions:

Multistage surgical tactics "damage control" in isolated and combined severe liver damage is an effective method in unstable patients with the risk of developing coagulopathy and multiple organ failure. The use of the "damage control" technique helped to reduce the mortality rate from acute pathology of the abdominal organs from 67.3% to 21.4%. The proposed algorithm, which is based on numbering criteria, excludes empiricism when choosing a treatment method for severe liver injuries in unstable patients at risk of developing coagulopathy and multiple organ failure, makes it possible to determine the indications for damage control with high accuracy, use this technique at the right time, recognize and prevent acceptable complications in advance, and predict the outcome of the disease

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