

Experience in the Treatment of Injuries of the Parenchymatic Organs of the Abdominal Cavity in Combined Injury

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Abstract

Background: The main problem is the diagnosis and treatment of combined closed abdominal trauma, accompanied by shock on the background of massive intra-abdominal bleeding with liver and spleen injuries. The hospital mortality rate for this type of pathology ranges from 17.3 to 72.7%. **Methods:** The treatment and outcomes of 539 patients with closed injuries of the abdominal organs in 2011 - 2021 were analyzed. Multi-stage "damage control" surgical tactics in isolated and combined severe liver injuries is an effective method in unstable patients with the risk of coagulopathy and multiple organ failure. **Results:** Out of 539 patients with closed abdominal injuries, 269 (49.9%) were operated on. Of these, 131 (48.7%) had liver and spleen injuries. According to the localization of damage according to the Mooge classification, there were: liver grade I in 9 people, grade II in 18, grade III in 25, grade IV in 17, and grade V in 3 victims. Spleen ruptures were diagnosed as grade I in 6 patients, grade II in 15, grade III in 26, grade IV in 10, and grade V in 2 patients. **Conclusion:** A necessary component at the final stage of surgical intervention is intestinal decompression in order to conduct enteral tube feeding to correct hypermetabolism and prevent secondary systemic complications associated with emerging enteric insufficiency.

Keywords: Injury, Parenchymal Organs, Abdominal Cavity, Surgical Treatment.

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Introduction

The main problem is the diagnosis and treatment of combined closed abdominal trauma, accompanied by shock on the background of massive intra-abdominal bleeding with liver and spleen injuries.^[1] The hospital mortality rate for this type of pathology ranges from 17.3 to 72.7%.^[2-4]

Relevance of the problem, according to experts Panasyuk A. I. et al. (2005), due to the continued growth of combined abdominal trauma, while a large number of complications (45.7-69.9%) and high mortality (16.2 - 69.5%), according to the authors, are associated with the lack of rational conventional surgical tactics for damage to parenchymal organs.^[5-11]

In blunt abdominal trauma, liver damage is expended from 10 to 17%.^[12-16] Among closed injuries of the abdominal organs, spleen ruptures account for 16-30%.^[17-20]

Objective: to improve the results of treatment of parenchymal organ damage in combined abdominal injuries.

Subjects and Methods

We analyzed the treatment and outcomes of 539 patients with closed abdominal injuries in 2011-2021. According to the mechanism of injury, the victims were distributed as follows: in 190 (35.3%) cases, a blow to the stomach was inflicted, in 205 (38.0%) – a road injury, in 84 (15.6%) a fall from a height, in 60 (11.1%) – compression. Young people predominated by age: to 30. There are 355 victims under the age of 30, 137 under the age of 31 to 50– 137, and 47 over the age of 51.

Of the 539 victims, 199 (36.9%) were admitted under the influence of alcohol. Up to 6 hours after the injury, 439 victims were received, up to 12 hours – 58, up to 24 hours – 15, and after 24 hours – 27 victims. The most frequent cases

of closed abdominal trauma were parenchymal organ damage 131 (24.3%) in combination with damage to the intestines (44), bladder (15), and kidney (12). Extensive retroperitoneal hematomas were more often observed with damage to the chest, pelvis, and spine.

Results & Discussion

Out of 539 patients with closed abdominal injuries, 269 (49.9%) were operated on. Of these, 131 (48.7%) had liver and spleen injuries. According to the localization of damage according to the Mooge classification, there were: liver grade I in 9 people, grade II in 18, grade III in 25, grade IV in 17, and grade V in 3 victims. Spleen ruptures were diagnosed as grade I in 6 patients, grade II in 15, grade III in 26, grade IV in 10, and grade V in 2 patients.

The severity of clinical manifestations in this pathology depends entirely on the degree of liver destruction, the amount of blood loss, the developed shock and hepatic - renal syndrome.

A feature of liver wounds is massive bleeding without a tendency to self-stop. It is caused by a double blood supply to the liver tissue (from the hepatic artery and portal vein), the presence of non-decaying long -term non-thrombosed damaged vessels. Prolonged profuse bleeding is a feature of the structure of the liver vessels, which do not subside, but are kept on the stroma, as on stretch marks. Apparently, there is a combination of both of these mechanisms.

The main complaints of patients are general weakness, dizziness, abdominal pain of varying intensity. Despite the fact that some authors do not attach much importance to them and consider them an uncharacteristic symptom in this injury, we did not observe a "painless" rupture of liver tissue in any patient in the clinic. Pallor of the skin, cold extremities, nausea, dizziness, frequent weak pulse are the result of anemia. When examining the abdomen in some cases, you can note the asymmetry due to the increase in its right ero half. Superficial palpation makes it possible to note the resistance of the anterior abdominal wall, and in some cases, protective muscle tension. Bloating is quite common of peritoneal irritation are weakly positive, and when combined with damage to the hollow, they are clearly manifested. With isolated the Shchetkin—Blumberg symptom becomes positive after 6-8 hours, when traumatic or biliary peritonitis begins to develop. Dulling of percussion sound in the lateral parts of the abdomen is a fairly common symptom. Frenicus symptom, a symptom of fluid movement in the abdominal cavity, soreness when pushing the lower parts of the chest (Dmitruk's symptom), soreness when pressing on the lower part of the sternum and the right costal arch (Hadri's symptom), according to our clinic, occur in isolated cases. Thus, with blunt abdominal trauma, it is quite difficult to recognize liver damage , but the mechanism

of injury, the presence of blood in the abdominal cavity, the clinic of shock and significant blood loss give grounds for this assumption.

With subcapsular ruptures, the clinical picture, it would seem, does not give reason to think about damage to internal organs: slight soreness in the area of the bruise, sometimes a slightly enlarged liver with a painful edge on palpation. However, in such patients , after 1-3 days , the pain increases somewhat, the body temperature rises to subfebrile numbers, and there is a slight jaundice of the sclera, which already suggests the presence of subcapsular ruptures. With continued bleeding, the tension of the hematoma increases, which can lead to rupture of the capsule and emptying the hematoma into the free abdominal cavity (two-phase organ rupture).^[21-23]

The clinical picture of simultaneous rupture of the pulp and spleen capsule is quite clear it is bright and shows symptoms of intra-abdominal bleeding. Many authors note that in this pathology, as a rule, there is a short -term loss of consciousness ("primary syncope"). In addition to the usual symptoms of blood loss: pallor of the skin, anxiety, frequent small pulse, low blood pressure, tension of the abdominal muscles in the upper left quadrant, blunting of percussion sound in the projection of the left side channel, it should be indicated that pain radiates to the left shoulder and shoulder blade, (roly-poly symptom, testicular tightening up to the left for) due to the contraction of the muscle that lifts the testicle (m. cremaster). Quite correctly indicates that the increase in the size of the spleen, determined by percussion, can be associated not only with subcapsular hematoma, but also with the accumulation of blood clots between the spleen and the diaphragm.^[24,25]

At the same time, the diagnosis of central and subcapsular hematomas is very difficult. After the "primary syncope" comes a light interval: the pain almost completely subsides, and the general state of health improves. Special attention should be paid to the mechanism of injury. The presence of fractures of the lower ribs on the left and mild pain in the left hypochondrium radiating to the left shoulder and scapula should alert the doctor. During palpation, it is sometimes possible to determine palpation and percussion expansion of the borders and enlargement of the spleen. The duration of the light interval can last from several hours to 3-4 weeks.^[26-28] Special attention is paid to small symptoms that may lead the doctor to think about subserous damage to the spleen.: subfebrility, leukocytosis, intestinal paresis, persistent from the moment of injury to the moment of capsule rupture.^[29-32]

In the future, among a relatively satisfactory condition, "secondary syncope" occurs with short -term loss of consciousness and increasing phenomena of profuse intra-abdominal bleeding. All of the above requires medical personnel to constantly monitor patients with closed abdominal injuries when applying force in the left hypochondrium.

Out of 131 operated patients, 20 (15.3%) patients with grade IV and V liver ruptures according to Moge had their bleeding stopped by "Damage Control". 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 20 patients with massive liver injuries, aged from 17 to 50 years, with an average age of 26 years, were analyzed. There were 12 males — and 8 females. The average assessment of the severity of damage on the ISS scale was 34 points (17-76), according to E. Mooge IV and V degrees of damage. The average blood loss was 2850 ml (1750-3850 ml). All patients underwent multi-stage laparotomy with gauze (film) tamponade surgery, average number of operations per 1 person 3 (2-5), liver wound suturing with tamponade (14), extensive hepatotomy and vascular ligation (3), atypical resection (2), large main vessels suturing with tamponade (1). The average bed/day in the intensive care unit is 13 (3-16), the average bed / day in the clinic is 25 (3-28). The mortality rate was 25.0% (5 out of 20), mainly due to purulent-septic complications and multiple organ failure.

Liver injuries that were treated with multi-stage surgical tactics such as "damage control" were classified as follows.

Option 1 - blunt abdominal trauma with isolated massive liver damage and blood loss of more than 2 liters (in 11 patients).

Option 2 - penetrating through wounds of the liver with damage to the main vessels (in 4 patients).

Option 3 - combined massive injuries of the hollow and parenchymal organs of the abdominal cavity (in 5 patients).

Criteria for the use of multi-stage treatment of severe category of victims was the presence of 3 out of 5 signs:

1-interoperable blood transfusion of 2 liters or more;

2-instability of the victim;

3-hypothermia (t in the esophagus $<34^{\circ}\text{C}$);

4-development of DIC-syndrome;

5-damage to the liver and other organs with massive bleeding.

In 30 patients with liver injury (16) and spleen injury (14) according to the Mooge classification of grade I-II, clear signs of intraperitoneal bleeding were noted upon admission to the clinic. In the ultrasound study, the volume of the hemoperitoneum in 30 patients ranged from 200 to 450 ml. These are hemodynamically stable patients. As a result, these patients recovered without surgical treatment.

In 30 patients with liver and spleen injuries, the hemoperitoneum volume was 355.5 ± 10.0 ml. They received conservative treatment.

All patients required transfusion of cryoprecipitate of the corresponding blood group at an average of 3.5 ± 0.3 doses,

12 patients - fresh frozen plasma at 350.80 ± 55.8 ml for each patient, and 8 patients - 250.5 ± 40.0 ml of donor red blood cell mass.

Conclusion

Multi-stage surgical tactics "damage control" for isolated and combined severe liver injuries is an effective method for unstable patients with a risk of developing coagulopathy and multiple organ failure. A necessary component at the final stage of surgical intervention is intestinal decompression for the purpose of conducting enteral probe feeding to correct hypermetabolism and prevent secondary systemic complications associated with emerging enteral insufficiency.

The mortality rate among 131 patients with parenchymal organ injuries was 15.3% (20 patients)

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