

SMP Surgery and Medicine

Our Experience in Conservative Treatment of Spleen Injury in Closed Abdominal Trauma

Umedov Kh A*, Karabaev HK, Mustafakulov IB, Shakirov BM, Normamatov BP, Alimov JI

Samarkand State Medical Institute, Surgery Department of the Centre of Emergency Medical Care, Samarkand, Uzbekistan

Publication Dates

Received date: January 06, 2022

Accepted date: February 06, 2023

Published date: February 08, 2023

* Corresponding Author

Umedov Kh A, Samarkand State Medical Institute, Surgery Department of the Centre of Emergency Medical Care, Samarkand, Uzbekistan. Tel: +998 998904774478, E-mail: baburshakirov@yahoo.com

Citation

Umedov Kh A, Karabaev HK, Mustafakulov IB, Shakirov BM, Normamatov BP, Alimov JI (2023) Our experience in conservative treatment of spleen injury in closed abdominal trauma. SMP Surg Med 1: 1-5

Abstract

The spleen is highly vascularized and is the most commonly injured solid organ in the abdomen, often as a result of blunt, penetrating, or indirect trauma. Under our observation there were 25 patients with spleen injury due to combined abdominal trauma, who underwent conservative hemostatic therapy. They were combined with skull trauma in 8 (32.0%) cases, chest - in 10 (40.0%) cases, pelvis and limbs - in 7 (28.0%) cases. The main criterion for choosing conservative treatment of patients was the presence of stable hemodynamics. The methods of conservative adequate hemostasis used by us in spleen injuries were effective in 93.3% of cases. There were no complications and deaths due to the use of conservative therapy and video-laparoscopic technique.

Keywords: Spleen; Abdominal

Introduction

There are closed and open abdominal injuries, accounting for 6-7% of the structure of sanitary losses in military conflicts of recent years.

The spleen is highly vascularized and is the most commonly injured solid organ in the abdomen, often as a result of blunt, penetrating, or indirect trauma [1,2].

The spleen has a number of important functions, the main of which are participation in hematopoiesis, the body's immune status, and an important role in the hemostasis system [3].

In particular, after splenectomy, there is a change in the main indicators of the vascular-platelet hemostasis link: an increase in the number of platelets and their functional activity, including adhesive ability, the reaction of the release of platelet factors is disturbed, and the retraction index decreases [4]. Changes can also be traced in the coagulation link of the hemostasis system: there is a shortening of the activated partial thromboplastin time, an increase in the concentration of fibrinogen, and inhibition of fibrinolysis. All this leads to the development of thrombotic complications [5].

The participation of the spleen in the immune status of the body has been proven. The spleen belongs to the peripheral lymphoid organs [6]. It concentrates suppressor, helper lymphocytes and part of effector cells, as well as the process of active antibody formation and production of humoral mediators of immunity [7]. The spleen contains approximately 35% T-lymphocytes and about 65% B-lymphocytes [8]. Both stages of differentiation of antibody-forming cells from bone marrow precursors take place in it, while for T-lymphocytes, the antigen-independent stage of differentiation from bone marrow precursors occurs in the thymus, and the antigen-dependent stage occurs in the spleen [9]. The complex structure of the lymphatic follicles of the spleen, including thymus-dependent, thymus-independent and macrophage elements, creates favorable conditions in the body for cell cooperation in the immune response [10]. There is no doubt that the removal of the spleen leads to a change in the immune status of the body and the development of infectious complications, especially those caused by opportunistic microflora.

In addition, splenectomy leads to the development of severe purulent-septic complications, both in the immediate and late postoperative period. It is known that in the immediate postoperative period after splenectomy, the number of

postoperative complications reaches 30% [11]. In this case, lethality is 16-30%.

In order to prevent the development of complications and preserve the main functions of the organ, various types of organ-preserving operations are currently proposed, if it is impossible to use them, autolien transplantation of fragments of the damaged spleen.

At present, with the development and improvement of laparoscopic techniques and imaging equipment, a new opportunity has appeared in the diagnosis and conservative treatment of spleen injuries. But the paucity of works in the periodical literature devoted to the study of non-surgical treatment of spleen injuries to preserve the organ urgently requires scientific research in this direction.

The purpose of the study

There was an improvement in the results of complex treatment for spleen injuries with closed abdominal trauma.

Material and Methods

Under our observation there were 25 patients with spleen injury due to combined abdominal trauma, who underwent conservative hemostatic therapy. They were combined with skull trauma in 8 (32.0%) cases, chest - in 10 (40.0%) cases, pelvis and limbs - in 7 (28.0%) cases. Of these, there were 19 men (76.0%), women - 6 (24.0%), the average age was 29.5 ± 1.5 years. The causes of the combined injury of the spleen were: a fall from a height - in 13 (52.0%) patients, a car injury - in 12 (48.0%) patients. Terms of hospitalization of patients with spleen injury from the moment of injury: up to 1 hour - 18 (72.0%), from 1 to 3 hours - 7 (28%) victims.

The main criterion for choosing conservative treatment of patients was the presence of stable hemodynamics. All patients at admission, in addition to the clinical examination, underwent ultrasound every 6-8 hours in dynamics, multislice computed tomography (MSCT) of the abdominal cavity, a plain radiograph of the abdominal cavity and other anatomical regions by localization, a general blood and urine test, and a coagulogram.

When looking for fluid during ultrasound, the lowest-lying areas of the abdomen were examined in all projections. The fluid was visualized as an anechoic zone. Small amounts of fluid were collected from women in the retrouterine space (in the space of Douglas), in men - in the hepatorenal recess (in the pocket of Morrison).

Subsequently, the tactics of management were determined depending on the severity of the patient's condition, the volume of hemoperitoneum, the intensity of blood loss (BCC), hemodynamic parameters (CVP, heart rate, diuresis).

Results

All patients with spleen injury upon admission to the hospital showed clear signs of intraperitoneal bleeding: abdominal pain, collapse, positive symptoms of Kerr, Eleker "Roly-Vstanki", Kulenkamph. In ultrasound examination, the volume of hemoperitoneum ranged from 200 to 350 ml in 15 patients, from 350 ml to 500 ml in 9, and more than 1200 ml in 1. The latter underwent blood removal by video laparoscopy with a favorable outcome.

All patients required transfusion of cryoprecipitate of the corresponding blood group, on average, 3.5 ± 0.3 doses, 16 patients - fresh frozen plasma, 350.0 ± 55.8 ml each patient and 9 patients - 250 ± 35.0 ml of donor erythrocyte mass. By the 7th day of treatment, ultrasound and MSCT revealed no free fluid in the abdominal cavity. As experience gained, we determined the criteria for conservative treatment: no signs of continued intraperitoneal bleeding; stable hemodynamic parameters (BP, CVP, heart rate) against the background of ongoing infusion and hemostatic therapy; the amount of blood poured into the abdominal cavity up to 400-500 ml (<10% BCC); no signs of peritonitis and damage to other abdominal organs.

The methods of conservative adequate hemostasis used by us in spleen injuries were effective in 93.3% of cases. There were no complications and deaths due to the use of conservative therapy and video-laparoscopic technique.

Conclusions

Non-surgical treatment of spleen injuries is a risky event and requires good equipment with visualization equipment in a medical institution, as well as the possibility of constant monitoring of the patient.

Therapeutic videolaparoscopy can become an alternative to laparotomy, which can reduce the incidence of postoperative complications.

References

1. Banerjee A, Duanes TM (2013) et al. Trauma centers variation in splenic artery embolization and spleen salvage: a multicenter analysis. *J. Trauma Acute Care Surg* 75: 69-75.
2. Gould JE, Vedantham S (2006) The role of interventional radiology in trauma. *Semin Intervent Radiol*, 23: 270-8.
3. Cinquantini F, Simonini E, Di Saverio S (2018) et al. Non-surgical Management of Blunt Splenic Trauma: A Comparative Analysis of Non-operative Management and Splenic Artery Embolization-Experience from a European Trauma Center. *Cardiovasc Intervent Radiol* 41: 1324-32.
4. Alimov AN (2013) Organ-preserving method of surgical treatment of a ruptured spleen with a closed abdominal injury. *Journal Surgery* 9: 39-43.
5. Mayakovsky VV (2014) The state of the problem and ways to optimize organ-preserving tactics in spleen surgery. *Journal Vop. reconstruct. and plast. Surgery* 17: 342-55.
6. Maslyakov VV (2010) The influence of the chosen surgery for spleen injury on the quality of life of operated patients in the long-term postoperative period // *Fundamental research* 6: 70-75.
7. Stein DM, Scalea TM (2006) Nonoperative management of spleen and liver injuries. *J Intensive Care Med* 21: 296-304.
8. Andersson R., Gustavsson T, Alwmark A (2015) Splenic artery ligation for traumatic rupture of the spleen. // *Acta Chir. Scand* 151: 709–710.
9. Backus CL, Park AE, Matthews BD (2000) Mini-laparoscopic splenectomy // *J. Laparoendosc. Adv. Surg.-Tech. A* 10: 259-62.
10. Bongard FS, Lim RC (2015) Surgery of the Traumatized Spleen. // *World J. Surg* 9: 391–7.
11. Peitzman AB, Harbrecht BG, Rivera L (2005) et al. Failure of observation of blunt splenic injury in adults: variability in practice and adverse consequences. *J Am Coll Surg* 201: 179-87.

