

Open and Closed Damage to the Abdomen with Associated Trauma

Mustafakulov Ishnazar Boynazarovich, Shakirov Babur Magrufovich*¹, Djurayeva Zilola Aramovna¹, Mamara-jabov Sobirjon Ergashevich² and Alimov Jurabek Ibodulloevich²

¹Samarkand State Medical Institute, Centre of Emergency Medical Care, Burn department, Department of Endocrinology, Samarkand, Uzbekistan

²Samarkand State Medical Institute, Centre of Emergency Medical Care, Burn department, Department of Surgery, Samarkand, Uzbekistan

*Corresponding author: Babur M. Shakirov, MD, Burn Department of the Samarkand State Medical Institute, 140129, 2 Nor Yakubov 3, Samarkand, Uzbekistan

Received: June 01, 2022

Published: June 21, 2022

Abstract

Introduction: The article presents the results of studying the modern literature on the diagnosis and treatment of severe concomitant abdominal trauma and their prediction. The authors provide the main literature data of domestic and foreign authors in recent years. A retrospective evaluation of patient's concomitant trauma of the abdominal cavity and retroperitoneal space were admitted to the Samarkand branch of the RSCUMA between 2009 and 2019 at the Emergency Department of our teaching hospital. Our study consisted of two stages - a retrospective one based on the results of studying the case histories of 208 patients with shock-related mechanical trauma and a prospective one, based on the analysis of the treatment results of 270 critically ill patients hospitalized with concomitant trauma. The main cause of death among 478 patients was a combination of injuries in 127 victims (26.56%), as well as the development of complications. Among patients with injuries of the abdominal organs, they were observed in 80 (16.73%) in the postoperative period.

Keywords: Abdominal trauma; Diagnosis and surgical treatment

Introduction

Abdominal trauma is one of the most urgent problems of urgent surgery. Closed and open (wounds) abdominal injuries have always been a complex surgical problem.

There are closed and open abdominal injuries, accounting for 6-7% of the structure of sanitary losses in military conflicts of recent years. In a peaceful environment, the damage to the abdominal cavity organs is the result of a traffic accident, falling from a height and beating [1].

Abdominal injuries account for 1.5 to 36.5% of peacetime injuries, but their frequency and severity continue to increase. According to A.N. Tulupov (2015), in severe concomitant trauma, injuries to the abdominal organs are present in almost 30% of victims [2]. Due to the severity of damage to internal organs and difficulties in diagnosis, such an injury is characterized by a high rate of complications and mortality, which, according to various authors, ranges from 25 to 65% [3].

WHO data indicate that an accident is the most common cause of this type of injury. Generalized data from South East Asia define trauma as the leading cause of mortality at the age of 1-44 years [4].

Closed abdominal injuries are accompanied by a large number of complications and high mortality due to difficulties in diagnosis and frequent combination with injuries of other organs and systems [5-11].

A special problem is the diagnosis and treatment of concomitant closed trauma of the abdominal organs, accompanied by shock. Hospital mortality in this variant of the pathology ranges

from 17.3 to 72.7% [9]. For example, over the past 5 years, the mortality rate from road accidents in Russia has increased by 65%, and the death toll reaches 33-35 thousand people per year [12]. In the literature, there are several terms that define multiple injuries to various areas of the body in severe trauma. In the Russian literature, the term severe concomitant injury (TTS) is most often used. However, in the big medical encyclopedia (1983) there is the following definition: polytrauma - simultaneous damage to several anatomical areas in one victim [13-18].

Concomitant injuries are the simultaneous damage to several different systems or organs. TCT as a model of an extreme condition is damage to two or more anatomical regions of the body. Concomitant injury, by which we mean the simultaneous injury of two or more of the seven anatomical regions of the body, is a complex multifactorial and severe form of injury, manifested by numerous pathological syndromes, accompanied by a frequent change in the dominant factor, a large number of complications and high mortality. In the diagnosis, the authors recommend indicating the leading injury. Thus, the analysis of scientific literature indicates that the choice of the volume of surgical intervention in patients with severe concomitant abdominal trauma against the background of traumatic and hemorrhagic shock is still an unsolved problem.

The purpose of the study

Improvement of the results of surgical treatment of damage to the abdominal organs in concomitant trauma by improving and

introducing new methods of diagnosis and rational surgical tactics, depending on the severity of the injury.

Materials and Methods

Treatment of victims with severe concomitant abdominal injuries was carried out in the conditions of round-the-clock emergency surgical care in the Samarkand Centre of Emergency Medical Care Samarkand, Uzbekistan

For the period from 2009-2019. 2645 patients with concomitant trauma of the abdominal cavity and retroperitoneal space were admitted to the Samarkand branch of the RSCUMA, of which 447 (16.9%) patients were operated on with concomitant abdominal trauma.

Our study consisted of two stages - a retrospective one based on the results of studying the case histories of 208 patients with shock-related mechanical trauma and a prospective one, based on the analysis of the treatment results of 270 critically ill patients hospitalized with concomitant trauma.

The criteria for inclusion in the research were the following attitudes: 1) shock-related concomitant mechanical trauma to the abdominal organs; 2) the age of the victims is from 18 to 89 years. The exclusion criteria were: 1) clinically significant comorbidities (oncological diseases and chronic diseases in the decompensated stage at the time of admission); 2) combined trauma of severe degree.

The study included 478 patients aged 18 to 89 years, among them - 306 men (64.0%) and 172 women (36.0%) Figure 1.

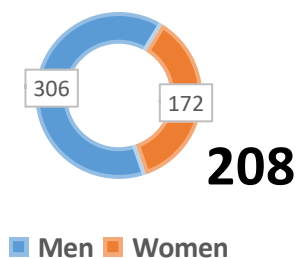


Figure 1: Distribution of victims by gender.

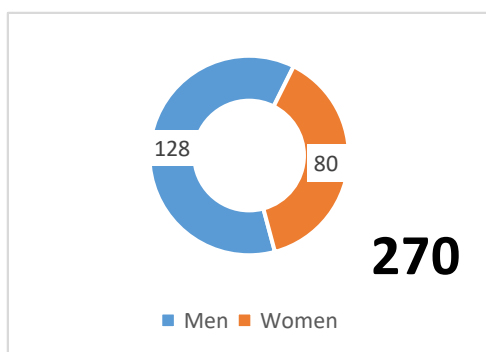


Figure 2: Distribution of victims by age of the control and main groups.

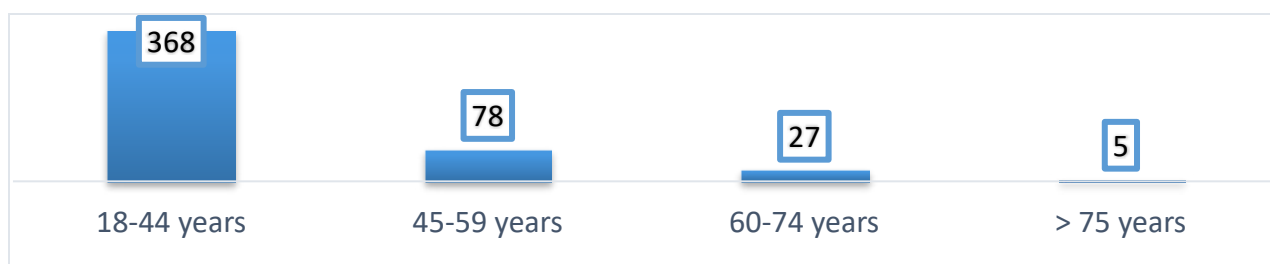


Figure 3: Distribution of victims by age.

Sorting of victims with abdominal injuries in cases of combined trauma by gender in the control and main groups is illustrated in Figure 2.

The average age of hospitalized patients was 33.8 ± 13.4 years, and most of them were people of working age, which also emphasizes the relevance of the problem under study (Figure 3).

As can be seen from Figure 5, over a 10-year period, the number of victims hospitalized in the SFRNCEMP increased 6 times. The overwhelming majority were delivered by ambulance teams - 416 (87%), who were provided with appropriate assistance at the scene of the accident, aimed at maintaining the vital functions of the body and preventing the development of life-threatening conditions. However, 62 victims (13%) were admitted by gravity, without providing the necessary assistance (Figure 4).

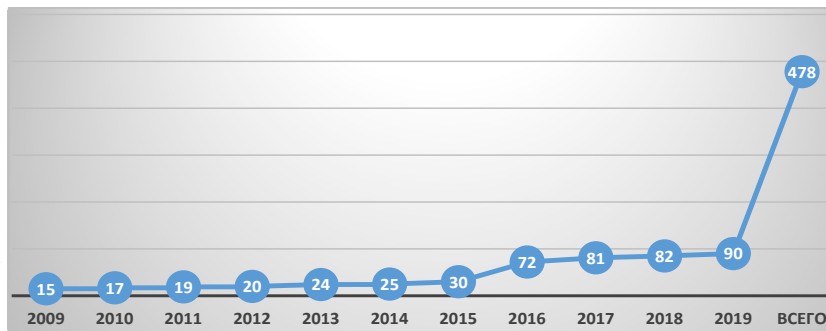


Figure 4: Dynamics of admission of victims with concomitant injury.

Among 478 victims, 447 (93.5%) were operated on. Of these, a lethal outcome was observed in the control group - out of 208 in 119 (57.21%), and in the main group - out of 270 - 88 (32.59%) - Figure 5, 6. Thirty-one (11.48%) patients with abdominal injuries (liver in 25 and spleen in 6) underwent conservative therapy in the presence of concomitant injury.

In most cases, the cause of injury was a road traffic accident (n = 358 - 74.89%), in 51 (10.67%) victims, the cause of injury was the result of striking the abdomen, in 61 (12.76%) cata- trauma (Figure 7). Alcohol intoxication was observed in 257 (53.77%) victims.



Figure 5: Ways of hospitalization of victims with associated trauma.

The severity of shock was assessed using the Allover-Gruber index (shock index).

Sorting of victims according to the degree of hemorrhagic shock is presented in Table 1. The data in the table indicate that 478 (100%) patients undergoing examination were admitted in a state of hemorrhagic shock (I, II, III and IV degrees).

Table 1: Sorting of victims with concomitant trauma of the abdominal organs according to the severity of hemorrhagic shock upon admission.

| Index Allover-Gruber | Shock degrees | Number of patients, n = 478 | | Total of died | |
|----------------------|---------------|-----------------------------|--------|-----------------|----------------|
| | | I gr. | II gr. | I gr. | II gr. |
| Up to 1.0 | I | 101 | 5 | 15 | - |
| 1.0 to 1.5 | II | 20 | 60 | 18 | 10 |
| 1.5 to 2.0 | III | 31 | 164 | 30 | 57 |
| 2.1 and more | IV | 56 | 41 | 56 | 21 |
| Total: | | 208 | 270 | 119 (57.21%) | 88 (32.59%) |

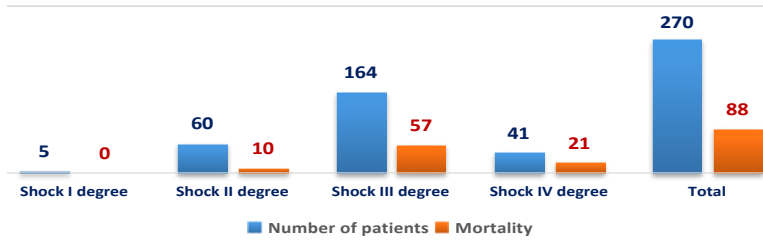


Figure 9: Dependence of the mortality rate on the degree of shock in the main group, n = 270.

The following Figure 10 shows the terms of hospitalization of the victims in the hospital from the moment of injury. Most of the patients were hospitalized before 3 hours from the moment of injury (n = 292, 61.1%). Moreover, in the first hour after the injury - only 60 (12.55%) patients.

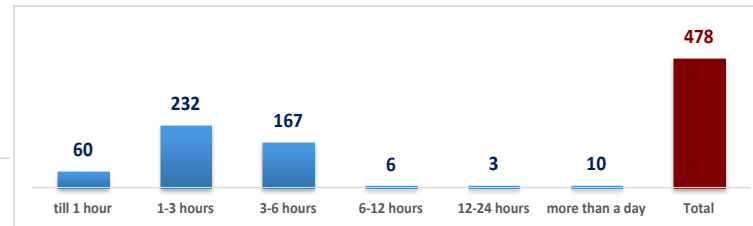


Figure 10: Distribution of victims by hospitalization period.

We also analyzed the frequency of damage to various anatomical areas of the body in victims with associated trauma (Figure 11). The largest group consisted of injuries to the head and limbs (62.0% and 58.9%, respectively), injuries to the chest organs - 40.5%, the spine - 27.2%, the pelvic bones and urogenital organs - 22.9%, abdominal cavity - 21.2%.

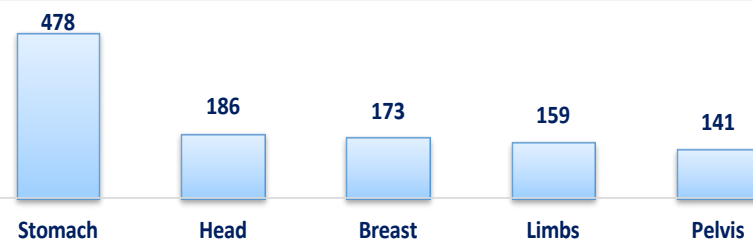


Figure 11: Frequency of damage to various anatomical areas.

Among 478 patients with concomitant abdominal trauma, in 261 cases (54.6%), the predominant injury was abdominal trauma, in 131 cases (27.4%) - craniocerebral (TBI), in 60 patients (12.5%) - chest trauma and combined injuries were found in 26 (5.5%) cases.

Most often, abdominal injuries were associated with TBI and chest trauma (n = 271; 56.7% of cases).

It is important to note that in 94.1% of cases, injuries of two or more anatomical areas were detected.

The total number of abdominal and retroperitoneal injuries detected in 478 patients is 880. Among the abdominal injuries, injuries of parenchymal organs were predominantly encountered (Figure 12).

Damage to the parenchymal organs (506) of the abdominal cavity and retroperitoneal space prevailed over injuries to the hollow organs (374) of the abdominal cavity (Figure 13).

In addition, 275 patients had extra-abdominal injuries (Figure 14), which were characterized by damage to the skeleton, soft tissues and chest organs.

Results and Discussions

In these observations, we noted two prevailing syndromes:

Figure 6: Mortality in the study and control groups.

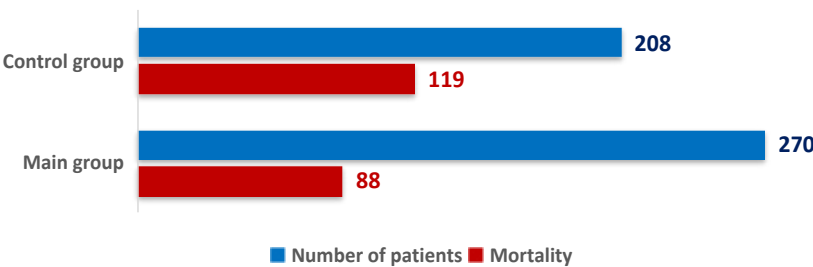


Figure 7: Distribution of patients by type and mechanism of injury.

Attention should be paid to the fact that in the control group, even with the development of hemorrhagic shock of the 1st degree, there were cases of lethal outcome; with the development of hemorrhagic shock of II, III and IV degrees, almost 100% mortality was noted (Figure 8).

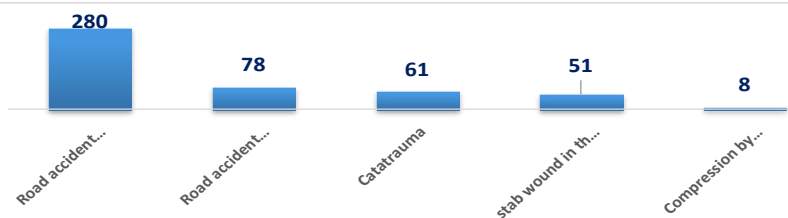
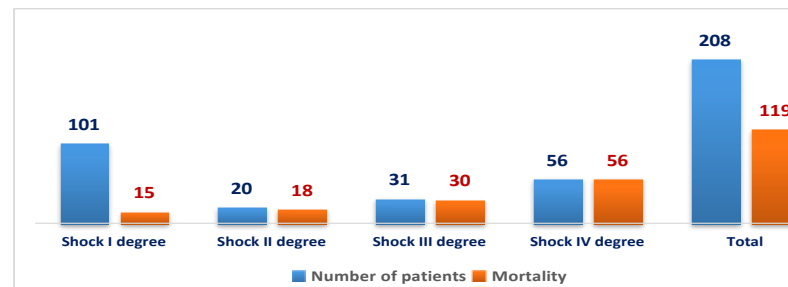


Figure 8: Dependence of the mortality rate on the degree of shock in the control group, n = 208.

With the use of improved surgical tactics in the main group, lethality significantly decreased, with no lethal outcome in case of grade I hemorrhagic shock, and 49% of patients with grade IV shock survived (Figure 9).



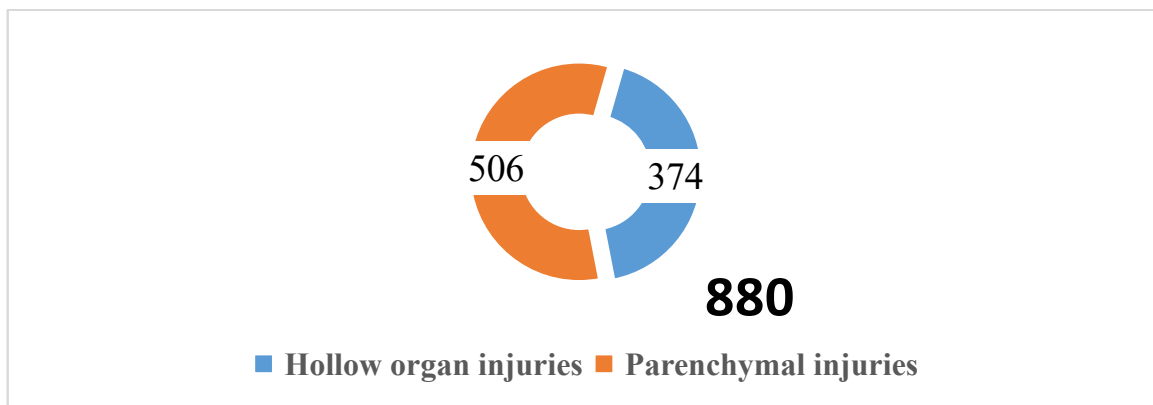


Figure 12: The structure of abdominal injuries in victims.

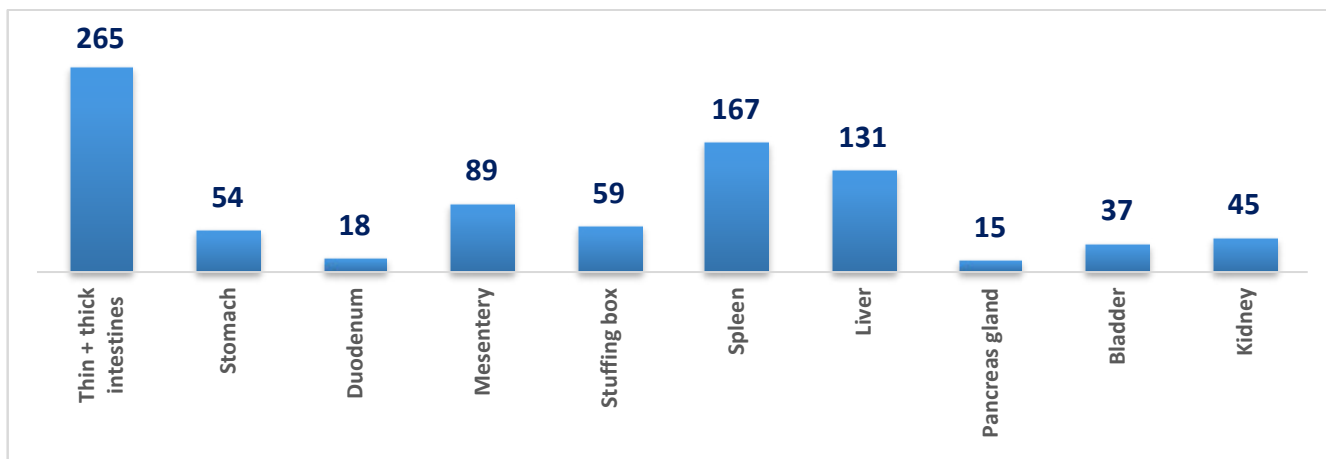


Figure 13: Damage to the abdominal organs and retroperitoneal space with concomitant injury.

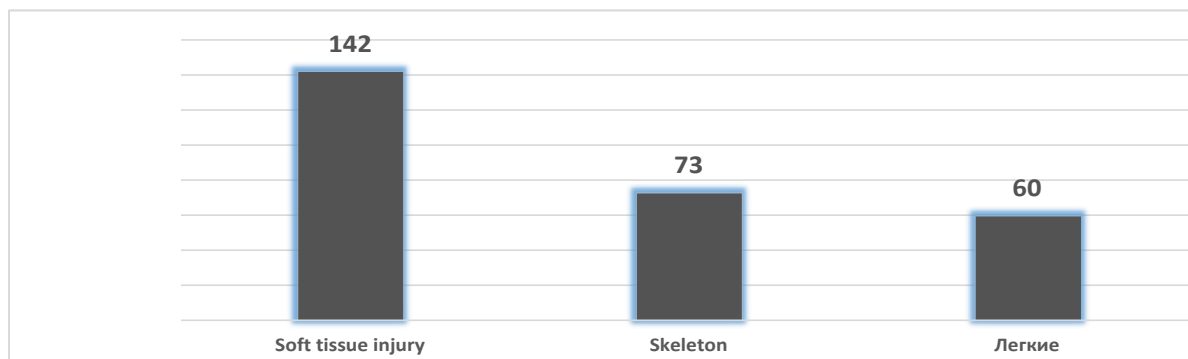


Figure 14: Extra-abdominal injuries in concomitant trauma.

developing peritonitis syndrome and intra-abdominal bleeding syndrome. The syndrome of developing peritonitis was encountered with injuries of the hollow organs.

Intra-abdominal bleeding syndrome was observed in the case of damage to the parenchymal organs or blood vessels of the mesentery and omentum, retroperitoneal space. At the same time, changes in hemodynamics were characteristic, as well as a decrease in a number of hematological parameters (hemoglobin, hematocrit, the number of erythrocytes), oliguria and leukocytosis with ruptured spleen (in 167).

We adhere to the following treatment tactics: with a distinct clinic of intra-abdominal bleeding and acute peritonitis - emergency operation (in 232 patients). In the absence of confidence in the presence of intra-abdominal bleeding and peritonitis, together with anti-shock therapy, such diagnostic methods are performed as pleural puncture (in 31), laparocentesis (in 40), laparoscopy (in 127), R-graph: skull (in 51), pelvis (in 30),

spine (in 37), retrograde cystography (in 15), ultrasound (in 201) and computed tomography (in 40 patients).

The most common in combined abdominal trauma was damage to the parenchymal organs in combination with damage to the intestine, bladder, and kidney. It took into account the fact that trauma to the liver, spleen, kidney, extensive retroperitoneal hematomas were more often observed with damage to the chest, pelvis and spine. On admission, symptoms of internal bleeding were noted in 250 (52.3%) patients and 48 (10.0%) patients with symptoms of peritonitis.

Conclusion

The main cause of death among 478 patients was a combination of injuries in 127 victims (26.56%), as well as the development of complications. Among patients with injuries of the abdominal organs, they were observed in 80 (16.73%) in the postoperative period.

References

1. Kman N, Knepel S, Hays HL. "The approach to penetrating abdominal trauma". *Trauma Reports*, 2012; 13(4): 1-12. Tulupov A.N. Severe combined injury. Monography//Russia 2015
2. Knepel S, Kman N, O'Rourke K, Hays HL. Blunt Abdominal Trauma. *Emergency Medicine. Emerg Med*, 2010; 42(8): 6-13.
3. Lin BC, Fang JF, Chen RJ, et al. Surgical management and outcome of blunt major liver injuries: experience of damage control laparotomy with perihepatic packing in one trauma centre // *Injury*, 2014; 45(1): p122-127.
4. Valiev E Yu. Experience in providing specialized care to patients with polytrauma in the conditions of RSCUMA // In Sat. "Modern military field surgery and injury surgery". St. Petersburg, 2011; pp. 67-68.
5. Khadjibaev AM, Akhmedov Yu M, Karabaev Kh K. et al. The choice of therapeutic and diagnostic tactics for closed combined abdominal trauma // *Materials of the All-Russian scientific conference "Modern military field surgery and injury surgery" with international participation. October 13-14, 2011 St. Petersburg*, p. 175.
6. Khadjibaev AM, Mustafakulov IB. Integral systems for assessing the severity of the condition of victims with severe combined abdominal trauma // *Journal "Bulletin of Emergency Medicine"*, 2012; 2: p. 73-78.
7. Saaiq M, Niaz-ud-Din, Zubair M, et al. Presentation and outcome of surgically managed liver trauma: experience at a tertiary care teaching hospital // *J. Pak. Med. Assoc*, 2013; 63(4): p. 436-439.
8. Abakumov MM, Bogopolsky PM. damage control: what's new? // *Surgery*. 2009; 11: p. 59-62.
9. Bagnenko SF, Chikin AE. Basic principles of the organization of assistance to victims with wounds and injuries of the liver and pancreas // *Annals of surgical hepatology*, 2009; 4: p. 96-101.
10. Leppaniemi AK. Who invented damage control surgery? // *Scand. J. Surg*, 2014; 103(3): p. 165-166.
11. Mohan B, Bhoday HS, Aslam N, et al. Hepatic vascular injury: Clinical profile, endovascular management and outcomes // *Indian heart journal*, 2013; 65: p. 59-65.
12. Mustafakulov IB, et al. Evaluation of the effectiveness of multi-stage surgical tactics for liver damage // *World journal of advance healthcare research*, 2020; 4(3): p.264-266.
13. Mustafakulov IB, et al. Severe combined abdominal trauma // *Journal of critical reviews*, 2020; 7(11): p.2214-2221.
14. Ozogul B, Kisaoglu A, Aydinli B, et al. Non-operative management (NOM) of blunt hepatic trauma: 80 cases // *Uluslararası Acil Cerrahi Derg.* 2014; 20(2): p. 97-100.