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Optimization of Diagnostic and Therapeutic Capabilities of Endovideolaparoscopy for Abdominal Trauma

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Abstract: Severe combined abdominal trauma is a particular type of injury and one of the leading causes of death among the wounded and injured in both peace and war. Abdominal injuries are directly responsible for 30% of fatalities reported annually due to motor vehicle accidents and have a significant impact on the outcome in an additional 58% of accidents. Abdominal trauma, as a rule, is accompanied by significant dysfunction of the vital organs of the abdominal cavity and retroperitoneal space, which subsequently cause metabolic disorders and the activity of other organs and systems. Most patients with severe combined abdominal trauma can be saved with a quick diagnosis (peritonitis and hemoperitonium), as well as modern active surgical tactics.

Key words: videolaparoscopy, laparotomy, early diagnosis, surgical treatment.

Relevance. Scientific and technological progress has led to the emergence of a traumatic pandemic caused by urbanization and the growth of the car fleet. The frequency of liver damage in closed abdominal trauma ranges from 12.0% to 46.9%, and in combined shockogenic abdominal injuries up to 49.4%. Among closed injuries of the abdominal organs, spleen injury occurs in 17-30% of cases, and in combined abdominal trauma 40.0%. A characteristic feature of recent decades is a change in the structure of injuries, an increase in the severity of injuries, mainly due to an increase in the proportion of combined and multiple injuries, the frequency of which reaches 55.0-80.0%. This category of injuries is characterized by high mortality and disability, respectively 50.0% and 74.0%. The increase in closed injuries of the abdominal organs requires optimization of diagnostic methods and treatment of these pathologies. In this regard, this problem remains relevant and in demand.

According to numerous studies, abdominal injuries account for 15.0% to 36.5% of peacetime injuries worldwide, but their frequency and severity continue to increase. In severe combined trauma, abdominal organ damage is present in 30.0% of victims. Such trauma, due to the severity of internal organ damage and difficulties in diagnosis, is characterized by a high frequency of complications and mortality, which, according to various authors, ranges from 25.0% to 65.0%. According to data, in case of isolated trauma to one abdominal organ, mortality ranges from 5.1% to 20.4%, and in case of combined trauma, from 18.3% to 64.0%. A promising direction for improving the results of parenchymal organ trauma treatment is minimally invasive surgery (endovideosurgery), which is characterized by low trauma, a wide range of surgical techniques, and the ability to clearly visualize topographically complex areas.

According to E.Yu. According to Valieva (2010), combined trauma is one of three causes of mortality in the population. The proportion of deaths in the working age is 28%, the average age is 37.5 years. Patients with combined trauma make up 10-15% of all hospitalized patients and account for more than 60% of all fatal outcomes from injuries (11,12,23,24).

Combined trauma is the simultaneous damage of two or more of the seven anatomical regions of the body by one traumatic agent. Among the causes of fatal outcomes from injuries, combined traumatic

injuries account for more than 65%, although they make up 8-10% of hospitalized patients with injuries (1,2,10,12).In recent years, a steady increase in injuries has been observed throughout the world. Man-made and natural disasters, local military conflicts, transport and industrial accidents in 55-65% of all injuries lead to combined and multiple injuries to organs and systems of the human body, and, as a consequence, to high sanitary losses in the first hours and days (1,12,20,21).

Abdominal injuries account for 1.5 to 36.5% of peacetime injuries, but their frequency and severity continue to increase. According to data, in severe combined trauma, abdominal organ damage is present in almost 30% of victims. Such trauma, due to the severity of damage to internal organs and difficulties in diagnosis, is characterized by a high frequency of complications and mortality, which, according to various authors, ranges from 25 to 65%. According to Shapot Yu.B. (2000) and Afonin A.A. (2013), with isolated trauma to one abdominal organ, the mortality rate ranges from 4.9 to 18.4%, and with combined trauma - from 19.3 to 66% (3,6,7,18). Closed abdominal trauma with combined trauma is accompanied by a large number of complications and high mortality due to the difficulties of diagnosis and frequent combination with damage to other organs and systems (4,5,16,17,26,27). A special problem is the diagnosis and treatment of combined closed abdominal trauma accompanied by shock. Hospital mortality for this type of pathology ranges from 15.3 to 68.7% (8,9,13,14). Over the past 5 years, mortality from road accidents in Russia has increased by 66%, and the number of fatalities, according to the State Traffic Safety Inspectorate, reaches 35-40 thousand people per year (19,25,29). In Uzbekistan, more than 680 thousand people suffer various injuries every year. It has been established that injuries due to road accidents account for about 13% of all injuries. But these injuries are the most severe in their consequences, and are the cause of almost a quarter of cases of disability and every third case of death.

Objective of the study. To evaluate the effectiveness of the use of therapeutic and diagnostic capabilities of endovideolaparoscopy in abdominal trauma.

Material and methods of the study. Treatment of victims of severe abdominal trauma was carried out in the conditions of round-the-clock emergency surgical care in the Samarkand branch of the RNCEM in Samarkand.

For the period from 2013-2023, 889 people with combined abdominal trauma and retroperitoneal organs were admitted to the Samarkand branch of the RNCEM.

Among 420 victims, 379 (92.6%) were operated on. Of these, a fatal outcome was observed in the control group - 8 out of 185 (53.5%), and in the main group - 4 out of 235 (46.5%). 29 (52.4%) victims with abdominal injuries (liver in 10 and spleen in 19) in the presence of combined trauma underwent conservative therapy. The cause of injury in most cases was a road traffic accident (n=358 – 74.89%), in 51 (10.66%) victims the reason for admission to the intensive care unit was an illegal injury (conflict situation), in 61 (12.76%) catatrauma (Table 1).

Objective of the study. Evaluation of the effectiveness of diagnostic and therapeutic capabilities of endovideolaparoscopy in patients with closed abdominal injuries.

Material and methods of the study. As a result of our study, 530 patients with combined injuries applied to the surgical department of the Samarkand branch of the RNCEM in 2019-2023.

Of the 420 patients with closed abdominal injuries, 371 (92.6%) patients were operated on. Of these, 150 (35.7%) patients in the control group, of which 8 (1.9%) died, and 221 (52.6%) patients in the main group, of which 4 (0.96%) were observed in patients. Of these, 49 (11.7%) patients were treated conservatively.

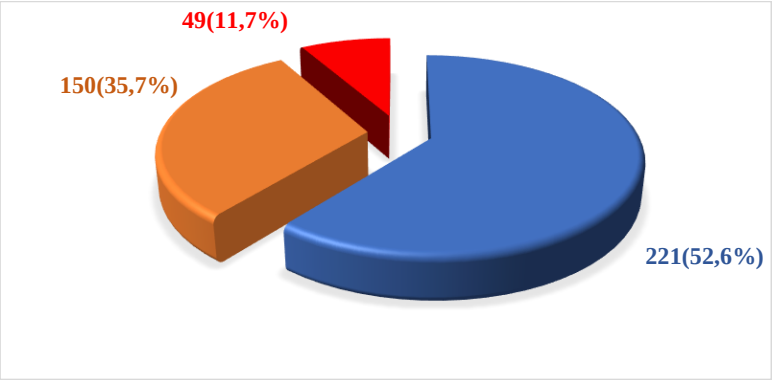

Fig.1.

According to the type of injury, 191 (51.5%) victims were involved in a traffic accident, 130 (35.0%) had a blunt blow to the abdomen, and 50 (13.5%) had a catatrauma (Table 1).

Cause of injury	Main group (n -221)		Control group (n -150)		Total	
	n -	%	n -	%	n -	%
Road traffic accident	103	46,6	88	58,7	191	51,5
Blunt abdominal trauma	87	39,4	43	28,7	130	35,0
Catatrauma	31	14,0	19	12,7	50	13,5
Total	221	100	150	150	371	100

In the main group of internal organ injuries, parenchymatous organ injuries occurred in 87 (39.4%) cases, intestinal injuries - in 57 (25.8%) cases, stomach injuries - in 23 (104%), intestinal mesentery injuries - in 32 (14) cases (0.5%), abdominal and back organ injuries - in 16 (7.24%), joint injuries - in 6 (2.71%) patients noticed.

According to the general condition of patients in the main group, 117 (52.9%) were satisfactory, 67 (30.3%) were of moderate severity, 26 (11.8%) were of severe severity, and 11 (4.9%) were of severe severity. patients. Among the injured, 57 (25.8%) were hospitalized in a state of alcoholic intoxication, which somewhat complicated the assessment of the severity of their condition.

It should be noted that the majority of victims had traumatic shock of varying severity in 98 cases (44.3%) (grade I - 18, grade II - 46, grade III - 32, no shock - 27 patients). To determine organ damage, a diagnostic program was used, including clinical laboratory and ultrasound examinations of the abdominal organs, laparocentesis and laparoscopy.

Statistical processing of the study results was performed using the "Statistics" program. The reliability of the normal distribution of data was confirmed by the Shapiro-Wilks test. The reliability of differences in results was determined using the Student criterion with a significance level of $p < 0.05$.

Results. According to our study, 162 (73.3%) patients were operated on using minimally invasive video laparoscopy. Initially, the general condition of the patients, hemodynamic parameters, invasive and non-invasive studies, not only surgical interventions, but also differential diagnostics of closed abdominal wounds, the degree of damage to internal organs according to the OIS data, complications in blunt trauma were assessed. These are the indicators on the basis of which the condition of the abdominal cavity and damage to abdominal organs, the presence or absence of internal bleeding and the size of hemoperitoneum, as well as the choice of treatment tactics were determined. the possibility of performing tactical and laparoscopic operations.

Depending on the severity of the condition, all patients were given the procedure every 6 hours from the moment of admission, depending on the general condition and hemodynamic parameters. Patients

in a state of shock, along with anti-shock therapy, underwent diagnostic measures. As a result of observation, traditional laparotomy was performed in 59 (26.7%) patients with unstable general condition, unstable hemodynamics and instrumental examinations. Damage to parenchymatous organs as a result of surgery required special attention. Surgical tactics are determined by the nature and degree of damage to the liver itself and other abdominal organs.

Liver damage and its suturing with a U-shaped suture were performed in 41 (89.1%) patients. In 12 (10.9%) patients, after surgical treatment and removal of crushed and non-viable tissues, vessels and bile ducts, the liver ulcer was tamponed with omentum. It should be noted that in case of appendicitis and abdominal trauma, simultaneous operations on the chest and musculoskeletal system, skull and spine were not performed.

The choice of surgical method in patients with blunt trauma of the liver and spleen was influenced by the degree of damage to the abdominal organs, which was determined by the OIS scale, as well as the technical support of the operating unit and the experience of the emergency surgical team in using videolaparoscopic surgery techniques.

Diagnostic laparoscopy is indicated for patients with suspected liver and spleen damage that meet the following criteria:

- stable hemodynamics;
- unconsciousness;
- organ injury according to the OIS scale up to grade III, detected by ultrasound or CT;
- hemoperitoneum up to 500 ml;
- inability to perform ultrasound or CT or their

Uninformativeness

Contraindications to laparoscopy.

- unstable hemodynamics;
- unconsciousness;
- organ injury of more than grade III according to the OIS scale;
- hemoperitoneum over 500 ml
- intra-abdominal bleeding continues;
- hollow organ injury (peritonitis)

Indications for conservative treatment in case of closed liver and spleen injury;

- stable hemodynamics;
- presence of consciousness;
- organ injury of no more than grade III on the OIS scale, detected by ultrasound or CT;
- hemoperitoneum up to 150-200 ml;

In 45 coagulation, 34 argoplasma coagulation, liver suturing using, 31 using a polypropylene mesh on a nitenol frame, 32 suturing liver wounds with Tachocomb stamping. In 6 victims with combined spleen injury, coagulation of its defect was performed. The operations were completed with drainage of the abdominal cavity. Complications in 2 patients (1.98%) in the early postoperative period included recurrent bleeding after coagulation of the liver rupture line of stage 1 according to the OIS scale. Relaparoscopy was performed with subsequent hemostasis by argon plasma coagulation and application of "Tachocomb". In 1 case (0.99%), an abscess of the subhepatic space was diagnosed, which required repeated surgical intervention. In 3 cases (2.97%), hypostatic pneumonia was observed. In 2 cases (1.98%), biloma was observed, which resolved on its own within 2 days. In 1 case (0.99%),

gastrointestinal bleeding was observed as a result of erosions of the stomach and duodenum. In 2 cases (1.98%), cystitis was observed. There were no fatal outcomes among patients with isolated liver damage. After laparoscopic operations, one patient died from complications of severe combined injuries. Good results of endovideosurgical interventions for liver injuries are explained, first of all, by adequate selection of patients at the stage of diagnostic laparoscopy.

Four patients died from diffuse peritonitis, multiple organ and acute heart failure.

Conclusion. The use of video laparoscopy for the diagnosis and treatment of closed abdominal injuries, a differentiated approach to the choice of treatment method using simultaneous endovideo surgery and traditional operations allows us to optimize the treatment of this complex category of patients.

Development and use of new minimally invasive technologies to reduce the number of patients requiring laparotomy. The main principles of providing emergency medical care during hospitalization at the first stage of the diagnostic scheme are: initial diagnosis with the identification of the primary injury, the size of hemoperitoneum according to UTT, the severity of injury according to the OIS classification, determining the systolic blood volume. pressure level. In conclusion, it can be said that the use of the diagnostic algorithm and tactics for treating closed cochlear sinus injuries developed by us significantly improved the results of surgical interventions by reducing complications and mortality of victims.

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