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# Aetiology and outcome of combined closed trauma of the abdomen according to the date of Samarkand hospital

**Mustafakulov I. B., Machmudov F. Ch., Norov M. Ch., Shakirov B. M.**

Samarkand State Medical Institute, Surgery department of RSCUMA, Samarkand, Uzbekistan

**Email address:**
baburshakirov@yahoo.com(Shakirov B. M.)

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**Abstract:** General principles of aetiology and outcome of combined abdominal closed traumas have been resumed and unified. Between 2000 and 2010, 1.758 patients with combined abdominal traumas were admitted to Samarkand branch of RSCUMA, Samarkand, Uzbekistan. Of them 305 (17, 3%) patients with combined closed traumas of the abdominal organs were operated on. Peculiarities of the clinical history and proved surgical treatment tactics of combined abdominal closed traumas have been presented. The final outcome of combined closed traumas depends performing an adequate firs aid in good time, correct surgical management of such types of patients.

**Keywords:** Combined Abdominal Trauma, Diagnosis and Surgical Treatment

## 1. Introduction

Despite increased awareness and prevention affords, trauma remains the number one case in of adults causing disability. According to the national trauma registry, abdominal traumas make from 1,5 to 18% of all peace – time traumas [1-6].

Combined abdominal closed traumas are accompanied by a great number of complications and high lethal outcome due to diagnostic problems and frequent presence of combined with other organs and system bringing lethal outcome of 18,3-64% [7-11].

Every year more than 800.000 people register various traumas in Uzbekistan. It is estimated that traumas due to road – transport accidents make about 5% of all traumas. But the results of these traumas are most severe and cause disability in every fourth case and death in every third case [12-13].

In this manuscript we discuss key issues to help clinicians efficiently and successfully evaluate and manage combined closed abdominal trauma. We also briefly review selected organs trauma, including trauma that involves liver, spleen, intestines, pancreas and other organs. Finally, we discuss some of issues, including length of hospitalization and returnning to activity recommendations for patients with intra-abdominal injuries

## 2. Material and Methods

Between 2000 and 2010, 1.758 patients with combined abdominal traumas were admitted to Samarkand branch of RSCUMA, Samarkand, Uzbekistan. Of them 305 (17,3%) patients with closed combined traumas of the abdominal organs were operated on.

The main types of patients with abdominal injuries in combined trauma according to their age and sex is presented in Table 1.

***Table 1.*** *Distribution of patients according to age and sex*

| Age groups | Male | Female | Total |
|---|---|---|---|
| < 21 years | 25 | 19 | 44 |
| 21-30 years | 81 | 20 | 101 |
| 31-40 years | 38 | 22 | 60 |
| 41-50 years | 19 | 35 | 54 |
| 51-60 years | 10 | 11 | 21 |
| > 61 years | 12 | 13 | 25 |
| Total | 185 | 120 | 305 |

The age of examined patients is from 17-89 years (33,8±13,4), with this most of them – 231(75,7%) patients mainly males 185 (66,6%) are able to work (up to 55 years old).

The causes of trauma were mostly the results of vehicle accidents, 219 (71, 8%); and catatrauma, fall from a height) – 86 (28,2%) (Figure 1).

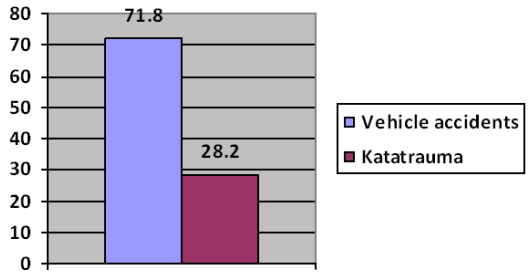


***Figure 1.*** *Aetiology of the burn injuries (%)*

The patients were distributed according to moderate, severe and extremely severe categories of patients (the average estimation of severity condition is according to APACHE scale II, 13,5±4,8 points, at the least 0 point and at most 30 points) in Table 2.

***Table 2.*** *Description of examined patients with combined trauma according to APACHE II scale during the first 24 hours*

| APACHE II, points | Number of patients | |
|---|---|---|
| | n | % |
| < 5 | 7 | 2,3 |
| 5-9 | 20 | 6,6 |
| 10-14 | 102 | 33,4 |
| 15-20 | 101 | 33,1 |
| 21-25 | 68 | 22,3 |
| 26-30 | 7 | 2,3 |
| Total | 305 | 100,0 |

The most part of patients 247 (81, 0%) was hospitalized during 3 hours from the moment of received trauma. Hospitalization terms from the moment of received trauma are shown in (Figure 2).

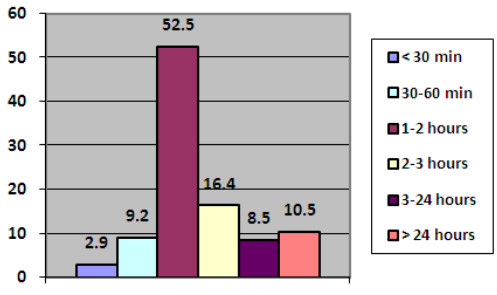


***Figure 2.*** *Hospitalization terms of patients with combined trauma from the moment of trauma to admission (%)*

Of 305 patients with combined abdominal trauma most patients, 191 (62, 6%), had abdominal injuries, 61 (20,0%) patients had craniocerebral traumas – (CCT), 32 (10,5%) – thoracic injuries and 21 (6,9%) had combined injuries Table 3.

***Table 3.*** *Frequency of combined injuries in closed abdominal trauma*

| Combined injuries | Number of patients | |
|---|---|---|
| | Абс. | % |
| Craniocerebral trauma (CCT) | 30 | 9,8 |
| Thorax | 16 | 5,2 |
| Support motor apparatus | 10 | 3,4 |
| CCT+ thorax | 45 | 14,7 |
| CCT + support motor apparatus | 28 | 9,2 |
| Thorax + support motor apparatus | 26 | 8,6 |
| CCT + Thorax + support motor apparatus | 150 | 49,1 |
| Total | 305 | 100,0 |

Of all patients hepatic injuries occurred in 131 cases, injuries of spleen in 167, small and large intestine in 265, duodenum in 18, pancreas in 15, stomach in 54, rupture of mesenteries in 89, omentum in 59, bladder in 37 and kidney in 45 (Figure 3) patients.

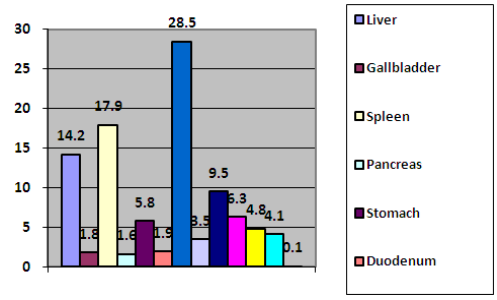


***Figure 3.*** *Frequency of injuries of organs in closed combined abdominal trauma (%)*

## 3. Treatment and Outcome

Most often injuries of parenchymatous organs, 298 (24, 3%) were noted in closed abdominal traumas in combination with injuries in the intestine (44), bladder (15), kidney (12).

Tactics of management was determined depending on severity of patient's condition, volume of hemperitoneum, intensity of blood loss, hemodynamic indexes.

We have analyzed 54 observations of combined closed injuries of the stomach. Injuries of gastric anterior wall were revealed in 32 patients, posterior wall in 6 patients with thoracoabdominal injuries, both walls of the stomach in 16 patients.

According to our observations most frequent combined injuries of the stomach in closed trauma were the following: injuries of the skull (62,5%), support – motor apparatus (51,8%), thorax (17,5%), other organs of the thoracic cavity (83,8%) and pelvic bones (7,7%).

Observation of 18 patients with closed injuries (87,5%) and wounds (12,5%) of the duodenum forms the basis of out study. Duodenal injuries in 4 cases (22,2%) were the result of catatrauma; in 6 cases road-transport accidents, industrial traumas in 3 (16,6%) cases, making on attempt to suicide in 2 (11,1%) cases, iatrogenic injury in one (5,5%) case, assaults in 2 cases.

Combined and multiple traumas occurred in 83, 4% and

were revealed more often in duodenal injuries which effected the degree of severity. Duodenal injuries were combined with trauma of pancreas – 6 (33,3%), liver – 4 (22,2%), gallbladder – 3 (16,6%), small intestine – 2 (11,2%) and stomach – 1 (5,5%).

In management of patients with traumas and injuries of the duodenum - 2 (11, 1%) only primary suture was performed.

In 6 (3,3%) cases in addition to primary suture cholecystectomy and amental bursadrainage, decompressive transnasal probe was fixed into the duodenum for active aspiration and intestinal probe for feeding was setted by Treit ligament.

In injuries of more than a half of duodenal circle simple diverticulazation of the duodenum (one case) was added to primary suture, in 2 cases duodenal diverticulazation was performed according to Donovan –Hagen (antrumectomy, truncal vagotomy, gastrenteroanastomosis on a long loop, cholecystostomy), in 3 cases feeding jejunostomy was performed according to Vitsel. In duodenal hematoma, its evacuation with following drainage of retroabdominal cellular tissue – 2 (11,1%) cases. In 2 cases due to late treatment and development of diffuse peritonitis operations were completed by laparostomy for programmed sanation of the abdominal cavity. In the last 3 cases duodenojejunoanastomosis was performed on the injured area of the duodenum on a long loop with Browns anastomosis.

In the last three cases there were complications from the side of anastomosis in the postoperative period.

Five patients with duodenal trauma had lethal outcome. The lethal outcome was caused by: severe closed craniocerebral trauma and polyorgan insufficiency in 2 cases, severe polytrauma with hemorragic and traumatic shock on the background of profuse intraabdominal bleeding from pancreatoduodenal zone vessels. In additional there was accompaning pathology (ischemic heart diseases, urolithiasis) making severe prognosis.

265 patients with various intestinal injuries have been operated on. 145 patient (54,7%) had injuries of small and large intestines and in 120 (45,3%) patients intestinal injuries were combined with traumas of other abdominal organs.

Correct preoperative diagnosis of intestinal injuries in combined intestinal and other abdominal organs traumas was made in 207 (78,1%) of 265 patients.

Suturing of the rupture in the small intestine was performed in 236 (89,1%) patients. 30-90 cm resection of the injured intestinal area was performed in 29 patients (10,9%). At the last stage of the operation careful toilet of the abdominal cavity and nasointestinal intubation were performed. Drainage was left according to indexes. In the postoperative period prophylaxis and treatment of peritonitis were of special care.

Lethal outcome made 26 cases. The causes of death were the following: multiple and combined injuries, progressing peritonitis due to late treatment and also pneumonia.

Closed abdominal trauma as a cause of acute traumatic pancreatitis was revealed in 12 patients. In 3 cases, AP cause was the result of stab – cut wound. In all patients pancreatic trauma was combined with injuries of other organs and systems (liver, spleen, stomach, small and large intestines and others).

Acute traumatic pancreatitis developed in all patients due to general and local changes. In mechanic injuries local changes in the pancreas occurred due to traumatic necrosis of the parenchyma, secondary destruction as a result of vascular and ducts injuries with discharging of active pancreatic juice.

Depending on the character and localization of the injury the following types of operative treatment of pancreatic traumas based on the principles of adequate draining of the injured zone; removing of lifeless granular tissues, reanimation of passage or rational diversion of pancreatic juice are used: hemostasis and draining of the injured zone – in 5 patients, opening and emptying of retroabdominal hematomas – 4, draining of injured pancreatic duct in 3, left side resection of pancreas – in 2, defunctionalizing of duodenum in – 1 patient

Of 15 patients with predominating injuries of pancreas 6 (40%) persons died. Of them 5 persons had severe destructive traumatic pancreatitis and one person had parapancreatitis and peritonitis.

Of 131operated patient's the were 10 patient's 4th and 5th degree rupture of the lever. taccording to Moore bleeding was arrested by "demege-controle". They were reoperated on the 3d -4th day after stabilization of hemodynamics, ruptures of the liver were sutured in 9 patients and repeated "demege-controle" was performed in one patient.

The following methods to arrest bleeding from the injuries of the liver were used: suturing of the wound, tamponade by omentum on the pedicle, surgical processing of the wound with its following suturing. In all cases the area of sutured wound of the liver was drained by chlorvinyle tube (0,8 sm).

The date of causes and frequency of lethal outcomes in patients with combined abdominal trauma are presented in Table 4.

***Table 4.*** *Causes of death.*

| The causes of lethal outcome | Number of the deceased | |
|---|---|---|
| | Абс. | % |
| Hemorrhagic shock | 11 | 35,4 |
| Nasocomial pneumonia | 5 | 16,9 |
| Cardiac insufficiency | 3 | 9,7 |
| Cerebral insufficiency | 3 | 9,7 |
| Peritonitis | 4 | 12,9 |
| Abdominal sepsis | 4 | 12,9 |
| Other cases | 1 | 3,2 |
| Total | 31 | 100,0 |

As it is seen from table 4, the most common cause of death (35,4%) was acute massive blood loss in combination with traumatic shock. Lethal outcomes due to blood loss occurred during first hours after admission or first 24 hours

after operation. The second cause according to lethal outcomes frequency were purulent inflammatory complications (25,8%) and nosocomial pneumonia (16,9%).

# 4. Discussion

The results confirm that combined abdominal closed traumas are primarily a disease of young adult's males. Abdominal trauma is one of the most severe types of injuries. It makes 25% of all most severe peace time injuries in Uzbekistan [14].

In recent years steady rise of traumatism is observed all over the world. Technogenic and natural catastrophes, local military conflicts, transport and industrial accidents in 50-60% of cases result in combined and industrial traumas of organs and systems of the human body and further high sanitary loss on the first hours and days [15-19].

According to the data of Valiev E. Y., [20] combined trauma is one of three causes of population death rate. The part of people dead in able-bodied age is 27% with average age of 38,5% years. The patients with combined trauma make 8-14% of all stationary patients and present more than 60% of all lethal outcomes due to traumas.

Combined abdominal trauma presents serious medical situation which demands cooperative effort from different medical subspecialties. In our case, abdominal surgeons took part in the management of the patient. It is also crucially important for a trauma surgeon to be suspicious of associated injuries and to have the patient under at least a 24-hour close observation especially when there is a suspicion of a misleading medical history. The trauma of the visceral organs is often multiple, and the management can be altered according to the needs of the patient.

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