

# Clinical Efficacy Of Diagnostic Laparoscopy In Abdominal Trauma

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**Abstract:** The article examines the clinical efficacy of diagnostic laparoscopy in abdominal trauma. Based on the analysis of 129 patients treated at the clinic of Tashkent State Medical University from 2023 to 2025, it was demonstrated that laparoscopy is the most informative minimally invasive method in cases of unclear clinical presentation. The authors developed and substantiated specific indications for this procedure, including the dynamics of pain syndrome, the presence of free fluid detected by ultrasound, and changes in hemodynamic parameters. The use of this technique allows timely identification of internal organ injuries and significantly reduces the number of unnecessary exploratory laparotomies.

**Key words:** abdominal trauma, diagnostic laparoscopy, polytrauma, hemoperitoneum, minimally invasive diagnostics, exploratory laparotomy.

Severe mechanical injuries rank second only to oncological and cardiovascular diseases as a cause of death among individuals younger than 45 years of age. Trauma, as a major social and medical problem, until recently had been studied only from a limited perspective. With the development of industry, particularly road transport and high-rise construction, the structure of injuries worldwide has changed significantly, leading to an increase both in the number and severity of injuries [1–5].

In cases of polytrauma, manifestations of traumatic shock come to the forefront, which makes the diagnosis of abdominal organ injuries considerably more difficult. Due to the variety of clinical manifestations of abdominal trauma, the rate of diagnostic errors remains relatively high (Pozharisky V.F. – 9.7%, 1998; Malinovsky N.N. – 10.2%, 1999; Eryukhin I.A. – 7.3%, 1999; Dronov V.F. – 7.9%, 2001; Muller G. – 6.1%, 2001). The lower diagnostic error rate reported by foreign authors is associated with the high informativeness of modern non-invasive diagnostic methods [5].

The high rate of diagnostic errors in abdominal trauma is largely due to the peculiarities of the clinical course of the disease. Depending on the severity of the injury, patients develop different degrees of traumatic shock, which consists of two phases: the erectile and torpid phases. The erectile phase is characterized by agitation, restlessness, and relatively stable blood pressure, whereas the torpid phase is associated with symptoms of internal bleeding. The features of the erectile phase largely explain the high frequency of diagnostic errors [1].

Currently, several instrumental diagnostic methods are used for the detection of acute surgical pathology in abdominal trauma. Ultrasound examination is considered one of the most informative methods, while radiological investigations also play an important role. The method of the “searching catheter” has not lost its significance either; in the absence of other diagnostic methods, it may help guide the surgeon toward the correct diagnosis [1,3,4]. However, at present, the most informative minimally invasive method in the comprehensive examination of patients with abdominal trauma, especially in combined injuries, is diagnostic laparoscopy [3,4].

This is due to the fact that ultrasound and radiological examinations are not always highly effective. The diagnostic accuracy of ultrasound barely exceeds 90%, radiological methods about 70%, while the “searching catheter” method provides approximately 30% diagnostic accuracy [3].

All of the above determined the subject of our research. The aim of the study was to determine the role and significance of diagnostic laparoscopy in the diagnosis of acute surgical pathology in abdominal trauma.

From 2023 to 2025, 129 patients with abdominal trauma were treated in the emergency surgical department of the multidisciplinary clinic of Tashkent State Medical University. In 53 patients the need for

surgical intervention was obvious, whereas in 76 patients diagnostic laparoscopy was performed due to the unclear clinical course of the disease.

Laparoscopy was performed according to a standard technique under pneumoperitoneum conditions with the mandatory use of an additional trocar for the manipulator, which allowed instrumental palpation and traction of abdominal organs.

Among the examined patients, there were 49 men (64.4%) and 27 women (35.6%).

Most patients were young. The age distribution was as follows:

- up to 20 years – 18 patients (23.7%)
- 20–40 years – 43 patients (56.5%)
- over 40 years – 15 patients (19.8%)

Due to the mild clinical presentation (moderate pain syndrome and absence of dyspeptic symptoms), only 23 patients (30.2%) sought medical care within the first two hours after trauma. 41 patients (53.9%) were admitted within 2–12 hours, and 12 patients (15.9%) were hospitalized more than 12 hours after injury.

The nature of previously performed surgical operations also played an important role in performing diagnostic laparoscopy. It was found that 9 patients (11.8%) had previously undergone appendectomy and 4 patients (5.2%) had hernia repair surgery. Previous surgical interventions did not affect the informativeness of diagnostic laparoscopy.

Analysis of the clinical presentation showed that 31 patients (40.7%) complained of abdominal pain, 27 patients (35.5%) had pain accompanied by dyspeptic disorders such as nausea and vomiting, and 18 patients (23.8%) exhibited moderate tension of the anterior abdominal wall muscles.

The results of diagnostic laparoscopy showed that in 41 cases (53.9%) no pathology of the abdominal organs was detected, while 35 cases (46.1%) revealed pathological changes in the abdominal cavity.

Among them: 13 cases (37.1%) – hemoperitoneum, 8 cases – liver rupture, 2 cases – combined rupture of liver and spleen, 3 cases – splenic rupture, 3 cases (8.5%) – urinary peritonitis due to bladder rupture, 7 cases (20%) – intestinal rupture, 3 cases (8.5%) – hematoma of the small-intestinal mesentery, 9 cases (25.9%) – retroperitoneal hematoma.

Based on the obtained results, the following surgical procedures were performed: suturing of liver rupture – 8 cases (22.9%), suturing of liver rupture with splenectomy – 2 cases (5.7%), splenectomy – 3 cases (8.5%), It should be noted that in no case was it possible to suture the splenic wound due to the large size of the injury.

In 3 patients (8.5%), bladder rupture was sutured with epicystostomy. In 7 cases (20%), suturing of small intestine rupture was performed. In cases of mesenteric hematoma and retroperitoneal hematoma, laparoscopic drainage of the abdominal cavity was carried out.

Analysis of clinical data and dynamic patient observation allowed us to determine a number of indications for diagnostic laparoscopy in abdominal trauma:

1. Presence of free fluid in the abdominal cavity on ultrasound with a “calm” abdomen.
2. Increasing abdominal pain during dynamic observation within 2 hours.
3. Persistence of intense pain for more than 6 hours.
4. Decrease in arterial blood pressure by 20 mmHg within 1 hour.
5. Decrease in hemoglobin level by 20 g/L within 2 hours.
6. Inability to exclude acute surgical pathology of abdominal organs during observation for more than 2 hours.

Analysis of the clinical material showed that if diagnostic laparoscopy had been performed strictly according to these indications, the procedure would have been required in 42 of 76 cases. Moreover, in all 35 cases where abdominal pathology was detected, diagnostic laparoscopy was indeed indicated according to our criteria.

Despite the developed criteria for performing diagnostic laparoscopy in emergency abdominal trauma surgery, it should be noted that in the presence of various comorbidities the clinical picture may be atypical. In such cases, indications for diagnostic laparoscopy should be individualized based on the characteristics of the clinical course. Such situations were observed in 7 cases, where diagnostic laparoscopy would still have been performed despite the absence of our defined criteria.

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Thus, the results of our study demonstrate that emergency diagnostic laparoscopy in blunt abdominal trauma allows timely identification of internal organ injuries and reduces the frequency of exploratory laparotomies. This necessitates the availability of diagnostic laparoscopic equipment in every surgical clinic.

The indications for diagnostic laparoscopy in abdominal trauma should include: presence of free fluid in the abdominal cavity on ultrasound with a “calm” abdomen; increasing abdominal pain during observation within 2 hours; persistence of intense pain for more than 6 hours; decrease in arterial blood pressure by 20 mmHg within 1 hour; decrease in hemoglobin level by 20 g/L within 2 hours; and inability to exclude acute surgical pathology of abdominal organs during observation for more than 2 hours.

However, in patients with concomitant diseases the clinical presentation may be atypical. In such cases, the decision to perform diagnostic laparoscopy should be made individually, taking into account the specific features of the clinical course.

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