



Article

## Improving Treatment Strategies for Acute Pancreatitis: Advantages and Potential of Video Endoscopy

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**Abstract:** T Acute pancreatitis remains one of the most common and severe inflammatory diseases of the abdominal cavity, accounting for approximately 25% of all acute abdominal pathologies. By comparison, acute appendicitis and acute cholecystitis account for 26% and 28%, respectively. According to global statistics, the mortality rate in acute pancreatitis ranges from 10% to 15%. The high mortality is primarily attributed to delayed medical intervention, incorrect initial diagnosis, and failure to accurately determine the stage and severity of the disease. The purpose of this study was to expand and optimize diagnostic and therapeutic capabilities of laparoscopy and videoendoscopy in patients with emergency surgery on acute pancreatitis. For our study we selected 34 patients with acute pancreatitis, 23 men 67,6% and 11 women 32,3%. From our selection 8 patients 23,5% came to the hospital from 6 to 12 hours from the beginning of the disease, 13 patients 38,2% from 12 to 24 hours, 9 patients 26,4% from 24 to 36 hours and 4 patients 11,7% after 36 hours. Eighteen patients 52,9% of our patients had the combined videoendoscopic and laparoscopic techniques applied ERCP + EPST + laparoscopy and sixteen patients 47% had a conservative therapy. Positive clinical results in our selection were performed in the vast majority of patients after minimal invasive interventions. The overall mortality rate was 11,8%, and this rate was several times lower as compared to techniques of general surgeries implemented in different surgical departments. The combined use of laparoscopy and videoendoscopic techniques enabled us to make an accurate diagnosis and effectively manage all complications of the pancreas. The combined use of videolaparoscopic and videoendoscopic techniques represents an effective, safe, and minimally invasive approach for the management of acute pancreatitis and its complications, leading to improved diagnostic accuracy, reduced postoperative complications, and better overall treatment outcomes.

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### 1. Introduction

Relevance of the problem: In recent years, despite the awareness efforts of medical workers and public activists, acute pancreatitis and its complications have continued to rise in our country due to an unhealthy diet and excessive alcohol consumption. One of the main reasons for this is the poor adherence to healthy lifestyle principles.

Over the past several decades, acute pancreatitis has remained a major clinical challenge in emergency abdominal surgery [1], [2]. Among emergency abdominal

pathologies, acute pancreatitis accounts for 3–10% of cases. Pancreatic necrosis develops in approximately 15–30% of these patients [3], [4]. This pathology has become a medical and social problem in emergency surgery, with a mortality rate of 0-1% to 75% for acute pancreatitis, depending on the type of disease [3], [5].

Pancreatic necrosis is one of the most severe complications of acute pancreatitis and is a serious surgical risk. According to multiple studies, the mortality rate of pancreatic necrosis in specialized centers varies between 11% and 30%, and in extensive cases may exceed 70–75% [3], [5], [6], [7].

Continuous scientific research is being conducted to reduce these indicators. The fate of the patient with acute pancreatitis is determined mainly by the degree of pancreatic necrosis and the presence of infection. Without timely surgical intervention, the mortality rate may reach nearly 100% [3].

According to the definition of specialists of the International Symposium on Acute Pancreatitis and the IX All-Russian Congress of Surgeons, acute pancreatitis is an acute aseptic inflammation of the pancreas, the basis of which is the processes of autoenzymatic necrobiosis, necrosis of surrounding tissues and the processes of restoration of endogenous rates of the cavity, peritoneal cavity and a complex of organ systems of extraperitoneal localization.

Acute pancreatitis (28%) is the most common of the abdominal diseases, taking the second place after acute appendicitis (27%) and acute cholecystitis (29%). According to comparative analyses, even in specialized centers, the mortality rate for acute pancreatitis and its various forms is 10-15%, and this figure continues to be high to this day. One of the main reasons for this can be attributed to the late presentation of patients to the hospital, incorrect diagnosis by doctors, and untimely assessment of the extent of the disease and the patient's condition, as well as incorrect conservative treatment and inadequate surgical procedures [1].

**Purpose:** To expand and improve the possibilities and results of laparoscopy and videoendoscopy in patients admitted to emergency surgery with a diagnosis of acute pancreatitis.

## 2. Materials and Methods

Between 2021 and 2025, 102 patients with acute pancreatitis and its various complicated forms were admitted to the Khorezm branch of the Republican Scientific Center for Emergency Medical Assistance at different stages of the disease. Of these, 71 (70%) were men and 31 (30%) were women, with ages ranging from 22 to 65 years. The time from disease onset to hospital admission varied among patients: 38 (37%) were hospitalized within 6–12 hours, 42 (41%) within 12–24 hours, 14 (14%) within 24–36 hours, and 8 (10%) after 36 hours.

All patients admitted to the hospital underwent standard instrumental and laboratory examinations (ultrasound, CT, Laparoscopy, X-ray, ERPXG) in the admission diagnostic department.

24 (24%) of the patients were diagnosed with acute stony cholecystitis, choledocholithiasis, and complications of biliary pancreatitis, and underwent ERPXG + EPST endoscopic surgical procedure. 6 patients with a history of cholecystectomy (CEC) were operated on in the District Medical Association. According to the literature, acute biliary pancreatitis accounts for 10-15% [1], [8], [9].

6 patients were diagnosed with PXES choledocholithiasis, 11 patients with CDS with a compressed stone, 6 patients with gallstone disease, acute cholecystitis with stones, complication: Choledocholithiasis. Mechanical jaundice. Pancreatitis with biliary edema. 1 patient was diagnosed with: Stenosing papillitis, acute edematous pancreatitis.

In the remaining 28 patients (27%) who presented 12–24 hours after symptom onset, laparoscopic lavage and abdominal cavity drainage were performed on the second day, followed by standard postoperative treatment [10], [11].

In 9 (9%) patients, on the 4th day of the disease, taking into account the general condition of the patient and the dynamics of the repeated ultrasound, the presence of free fluid in the abdominal cavity, laboratory tests, and the ineffectiveness of conservative

treatment, late laparoscopic sanitation with the CEC and the Halsted-Pikovsky method of cannulation of the common bile duct, and cannulation of the bursal sac were performed.

In 2 (2%) patients, on the 4th day (the transition of the process from the edematous form to the purulent phase), an omentobursostomy was performed to drain the abdominal cavity and bursal sac.

12 (12%) patients had concurrent gallstone disease. With the diagnosis of acute cholecystitis, laparoscopic cholecystectomy, choledochal tube according to Halsted-Pikovsky, abdominal cavity sanitation, and tube placement were performed.

4 (4%) patients underwent diagnostic laparoscopy, conversion of the abdominal cavity, and bursal tube placement, omentobursostomy on the 6th day of the disease.

In 23 patients, mainly those who presented within the first 12 hours, treatment was carried out in intensive care and surgical hospitals after the results of standard examinations. All patients underwent epidural catheterization. In dynamics, ultrasound of the abdominal cavity and MSCT of the abdominal cavity were performed. Based on dynamic observations, patients were discharged from the hospital in satisfactory condition, under the recommendation of a surgeon and gastroenterologist at their place of residence [12], [13].

### 3. Results

Of the patients who underwent inpatient treatment, 23 achieved a positive result with conservative, i.e., standard treatment, which is 23%. The average duration of treatment of patients, i.e., the average length of stay, is 7-10 days. Patients were discharged home in stable and satisfactory condition.

One patient (4.3%) was readmitted shortly after discharge following conservative treatment.

In 24 patients (24%), minimally invasive endoscopic and laparoscopic procedures were performed (4 ERCP+EPST and 14 laparoscopic interventions). Among them, 4 patients with stenosing papillitis and acute edematous pancreatitis developed recurrent stenosing papillitis within one year (17%).

In two patients, diagnostic laparoscopy was converted to open surgery, and in one patient, relaparotomy with partial necrectomy, lavage, and drainage was performed on the 4th day of illness.

In 1 (4%) patient, laparotomy, necrotectomy, and drainage of the pancreatic sac were performed on the 8th day. The postoperative diagnosis was acute total hemorrhagic pancreatic necrosis, aseptic phlegmon of the retroperitoneal cavity, parapancreatogenic abscess, diffuse purulent fibrinous peritonitis, and sepsis.

In dynamics, in 2 patients, the condition worsened in dynamics on day 13 and in 1 patient on day 18, and despite the treatments performed, exudate was observed. The mortality rate was 8.3%; the cause of death was acute total hemorrhagic pancreatic necrosis, acute diffuse purulent fibrinous peritonitis, multiorgan failure, acute bleeding, and hemorrhagic shock.

One patient who underwent early laparoscopic lavage and drainage on the 2nd day of illness required relaparoscopic revision and drainage, while the remaining patients achieved favorable postoperative outcomes with conservative management.

### 4. Discussion

The results of the present study indicate that the combined application of videoendoscopic and laparoscopic techniques in the treatment of acute pancreatitis significantly enhances both diagnostic accuracy and therapeutic efficiency. It is important to note that in relation to the 102 individuals participating in the analysis, the use of minimally invasive approaches, that is, ERCP and EPST, as well as the implementation of a laparoscopic surgery facilitated a significantly lower rate of postoperative complications and decrease in mortality in comparison with conventional open surgical methods. According to the results of the analysis, the average mortality rate equaled 8.3% as

opposed to the 10–15% range considered as the average. In addition, with the help of these procedures, it is possible to note that the need for reoperation is lower since the effect of such methods is more sustained. Thus, minimally invasive intervention in the disease reduction during the acute phase that can be discussed above helps to contribute to a decrease in cases of mortality associated with the most severe conditions, such as multiple organ failure or infectious complications that can culminate in sepsis.

The data also emphasize the importance of early hospitalization and timely diagnosis. Patients admitted within 12–24 hours after the onset of symptoms demonstrated faster recovery and fewer postoperative complications. This observation corresponds with the findings of other researchers, who highlight that the early phase of the disease represents the most favorable period for intervention before irreversible pancreatic necrosis develops [15], [16]. On the contrary, those cases where patients were admitted twenty-four hours later had necrotizing complications' incidences. Additionally, the patients' admissions had longer hospitals as compared to those admitted before the thirty-sixth hour. Particularly, in diagnosing biliary pancreatitis, endoscopic retrograde cholangiopancreatography and endoscopic papillotomy is highly beneficial. From our data and the successful treatment of our samples, we note that the two procedures have dual advantages of treatment and diagnosis. Similar results were reported by Borodin et al [10], who demonstrated that early ERCP, along with minimally invasive drainage procedures, significantly reduces the risk of biliary obstruction and infectious complications. Moreover, videolaparoscopic sanitation and drainage effectively controlled intra-abdominal infection foci and managed peripancreatic fluid collections without the need for open surgery.

Our findings also demonstrate that the combined use of laparoscopy and videoendoscopy enables comprehensive management of pancreatic complications such as peripancreatic abscesses, biliary obstruction, and pseudocyst formation. Postoperative pain relief and shortening of the hospital stay and duration of morbidity are not the only advantages of the treatment of patients in this fashion; in addition, the rate of postoperative septic complications was significantly reduced as well. Meanwhile, the positive effect of the conservative therapy alone was comparatively modest: it has been effective only at the mild form and edematous form of this disease; the necrotizing and the severe cases required the operative treatment. Considering that the presented treatment also is related to the effectiveness of the control over the stenosing papillitis, a 1-year recurrence rate of 17% necessitates one-year follow-up of the patient and endoscopic recanalization in such cases. Nevertheless, no severe postoperative complications or mortality were recorded following videoendoscopic interventions, confirming the safety, reproducibility, and clinical reliability of this method.

Overall, the present study demonstrates that minimally invasive approaches particularly the combination of laparoscopy and videoendoscopy represent an effective, safe, and physiologically favorable alternative to open surgery in the treatment of acute pancreatitis. These findings are consistent with the current global trend toward minimally invasive and organ-preserving surgical practices. Therefore, the integration of laparoscopy and videoendoscopy into emergency surgical protocols should be considered a crucial step forward in improving the management of acute pancreatitis and its complications.

## 5. Conclusion

Based on the conducted clinical observations and obtained results, it can be concluded that the combined application of videolaparoscopic abdominal interventions and minimally invasive endoscopic methods markedly enhances diagnostic accuracy and therapeutic outcomes in patients admitted to emergency surgery with acute pancreatitis and its complications. The combined method facilitates the earliest possible detection of necrotic and inflammatory changes, which in turn minimizes the number of postoperative complications and shortens the hospital stay. Videoendoscopic technologies, and particularly endoscopic retrograde cholangiopancreatography and endoscopic papillosphincterotomy, have a crucial role in the management of acute biliary pancreatitis. In case of bile duct obstruction, stricturing papillitis, endoscopic intervention eliminates

biliary hypertension and promptly restores bile outflow, securing a 100% favorable clinical course of the disease and minimizing the risk of recurrences. It is already obvious that videolaparoscopy is a reasonably efficient and minimally traumatic method of surgery in early pancreatitis. This technique provides a direct view of the abdominal cavity, clinical visualization of inflammatory and necrotic foci, and the possibility of directed drainage and sanitation. Early intervention is accompanied with a lower mortality rate, minimum incidence of multi-organ failure cases, and a more favorable postoperative period. The implementation of laparoscopic and endoscopic methods of examination and treatment in the algorithm for diagnosing and managing pancreatitis has created entirely new possibilities for individual, organ-sparing and minimally traumatic approaches to treating diseases. The joint use of laparoscopic and endoscopic instruments not only increases the efficacy of surgical treatment but also significantly reduces the number of open interventions with all the consequences, such as complications and patients' capacity to work.

Further advancement of video-assisted surgical techniques along with the adoption of modern imaging and navigation systems will broaden the possibilities for early, precise, and less traumatic intervention, ultimately contributing to reduced morbidity and mortality rates among patients with acute pancreatitis in emergency surgical practice.

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