

## TACTICS OF MODERN MINIMALLY INVASIVE INTERVENTIONS IN SURGICAL TREATMENT OF ACUTE PANCREATITIS

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**Abstract:** Minimally invasive interventions are more effective than open surgery in the treatment of aseptic severe acute pancreatitis. This was shown by analysing data obtained from the treatment of 182 patients with severe acute pancreatitis. The reduction in the incidence of mortality was 6.2% and 17.2%, respectively. Since the mortality rate was 19.8% in infected pancreonecrosis, the use of minimally invasive procedures was preferred over open surgery.

**Keywords:** Severe acute pancreatitis, surgical approach, minimally invasive interventions.

## ТАКТИКА СОВРЕМЕННЫХ МИНИИНВАЗИВНЫХ ВМЕШАТЕЛЬСТВ В ХИРУРГИЧЕСКОМ ЛЕЧЕНИИ ОСТРОГО ПАНКРЕАТИТА

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**Аннотация:** При лечении асептического тяжелого острого панкреатита миниинвазивные вмешательства эффективнее, чем открытые операции. Это было показано анализом данных, полученных из лечения 182 пациентов с тяжелым острым панкреатитом. Снижение частоты смертности составило 6,2% и 17,2% соответственно. Поскольку частота смертности составила 19,8% при инфицированном панкреонекрозе, использование миниинвазивных процедур было предпочтительнее, чем открытые операции.

**Ключевые слова.** Тяжелый острый панкреатит, хирургическая тактика, миниинвазивные вмешательства.

### RELEVANCE

Acute pancreatitis ranks third among urgent surgical diseases, with mortality in severe forms reaching 30% and up to 80% with the development of purulent-septic complications. This makes it an urgent problem to improve the diagnosis and treatment of this condition. However, there are disagreements regarding which surgeries are best performed at different stages of the disease. Aseptic enzymatic damage to the pancreas and the development of severe acute pancreatitis leaves an ambiguous question about the choice between open and minimally invasive approaches. In the late phase of acute pancreatitis, purulent-septic complications develop in 30-50% of cases and are accompanied by a high mortality rate of up to 80%. This shows the importance of developing an ideal surgical strategy. However, there is no clear decision yet on which surgeries are preferable for patients with such complications. The choice between minimally invasive and open methods is an important issue, since each method has its own advantages and disadvantages. Although open surgeries may provide more effective debridement of the purulent-septic focus, minimally invasive procedures are less invasive. Thus, the question of the reasonable choice of treatment method at different stages of acute pancreatitis remains unresolved. This emphasizes the need for additional research in this area.

### PURPOSE OF THE STUDY

Improving treatment outcomes in patients with severe acute pancreatitis by improving surgical strategies using minimally invasive technologies.

## MATERIALS AND METHODS OF RESEARCH

The study revealed interesting things about 182 patients with severe acute pancreatitis in the Samarkand branch of the RNCEM from 2018 to 2023. The study included both men and women aged 57.1% and 42.9%, respectively, the average age of patients was 51.6 years. In 51.1% of cases of severe acute pancreatitis, the cause was the alimento factor and alcohol abuse, and in 42.9% of cases, the cause was impaired pancreatic secretion outflow and intraductal hypertension caused by gallstone disease, damage to the extrahepatic bile ducts. In 6% of patients, the cause of acute pancreatitis remains unknown. After analyzing clinical and laboratory data, ultrasound, computed tomography (CT) and diagnostic laparoscopy results, 182 patients were diagnosed with severe acute pancreatitis. The 2012 Atlanta classification was used to classify the disease by severity. The Balthazar-Ranso pancreatitis severity index was used on CT to assess the extent of primary pancreatic necrosis. About two-thirds of patients (65.9%) had small focal pancreatic necrosis. Large focal and subtotal necrosis were observed in 34.1%. According to the study, 48.9% of patients had one area of retroperitoneal tissue affected, while 51.1% of patients had two or three areas affected. Most patients with severe acute pancreatitis (40.7%) underwent minimally invasive surgery, while 37.4% underwent open surgery. Aseptic pancreatic necrosis was recorded in 107 patients, or 58.2% of all patients. Severe acute pancreatitis was detected in 75 patients (41.2%). Clinical, instrumental and laboratory signs such as persistent hyperthermia and leukocytosis, detection of gas bubbles on ultrasound and CT, and positive results of culture of discharge from abdominal drainage or aspirate during percutaneous puncture served as criteria for determining infection. Patients with severe acute pancreatitis were divided into two groups: group A consisted of 107 people with aseptic necrosis of the pancreas, and group B consisted of 75 people with infected necrosis of the pancreas. Group A was further divided into three groups: A1 used only conservative treatment, A2 performed open operations and A3 used minimally invasive ones. In addition, group B was divided into two subgroups. Subgroup B1 included minimally invasive operations, and subgroup B2 included open operations. In 17.7% of patients with aseptic pancreatic necrosis (Group A), there was enzymatic peritonitis, and in 8.4% of patients there was serous-fibrous peritonitis.

In the group of patients with infected pancreatic necrosis (Group B), erosive bleeding (13.3%), intestinal fistula formation (14.6%), and a combination of erosive bleeding and intestinal fistula formation (9.3%) were observed. In addition, 32% of patients had retroperitoneal phlegmon, and 17.3% had serous-fibrous peritonitis. Instrumental diagnostic methods included ultrasound, computed tomography, EGDFS, diagnostic laparoscopy, diagnostic puncture and drainage of the abdominal cavity and/or retroperitoneal space.

Complex conservative therapy administered to 182 patients with TOP included the following components:

- infusion therapy for rehydration and detoxification, at a rate of 40 ml per 1 kg of patient weight with forced diuresis;
- analgesia, non-narcotic analgesics (NSAIDs, antispasmodics)
- epidural blockade of 6-10 ml of 2% lidocaine was performed in 140 (76.9%) patients, the pain syndrome was relieved 15-20 minutes after the injection, if necessary, the epidural blockade was repeated after 24-48 hours;

- the use of antisecretory drugs in all patients included in the study (proton pump inhibitors Omeprazole were used in 106 (58.2%) patients, H<sub>2</sub>-histamine blockers Cimetidine were used in 76 (41.8%) patients;

- antibacterial therapy was used in all patients included in the study, Cefoperazone and Amoxicillin were used for the treatment and prevention of infection in patients with aseptic necrosis of the pancreas (group A) and with infected necrosis of the pancreas (group B).

### RESEARCH RESULTS

Of the 142 patients with severe acute pancreatitis (SAP), 51.4% underwent minimally invasive surgery, and 48.6% underwent open surgery. For the treatment of aseptic SAP in 16.4% of patients, abdominal drainage and videolaparoscopic sanitation were used.

Opening of the pancreas was performed through one or both lateral approaches in case of extensive aseptic necrosis of the pancreas with signs of peritoneal protrusion. In case of fluid accumulation in the omental bursa, it was drained through the gastrocolic ligament. As the volume of fluid released from the abdominal cavity decreased, the drains were removed one by one over three days. The drainage from the omental bursa was usually removed 7–10 days after the operation.

In three cases (4.8%) of patients with severe acute pancreatitis (SAP), fluid collections were found in the retroperitoneal region or omental bursa. In these cases, percutaneous punctures were performed using ultrasound navigation. These procedures were not only useful for treatment, but were also used to diagnose suspicious pancreatic necrosis.

Various types of open surgeries were performed to treat 35 patients (19.2%) with aseptic necrosis of the pancreas. This included wide midline laparotomy with abdominal drainage in 19 patients who had signs of decompensated duodenal obstruction or ruptured pseudocyst. Minilaparotomy with drainage of the abdominal cavity and omental bursa was used in 21 patients with enzymatic peritonitis. In two patients suffering from decompensated duodenal obstruction due to the formation of paraduodenal infiltrate, an anterior-colic gastroenteroanastomosis with an interintestinal anastomosis according to Brown was performed. After opening the omental bursa, abdominization of the pancreas was performed in twelve patients. This was followed by drainage of the abdominal cavity and omental bursa, with special emphasis on rupturing the developing pseudocyst. After open surgery for the treatment of aseptic necrosis of the pancreas (ANP), the surgical wound was closed. Treatment of infected pancreatic necrosis (group B) included minimally invasive interventions such as percutaneous drainage of the omental bursa under ultrasound guidance for the treatment of pancreatic abscess or acute infected fluid collection. Fistulography, computed tomography, and ultrasound were used to determine the effectiveness of drainage and to detect residual cavities. For the treatment of purulent-septic forms of PNP, open surgery using minilaparotomy, lumbotomy, and wide midline laparotomy were the main treatment method in 18.7% of patients.

Lumbotomy was performed with small incisions of 4-5 cm in length in cases where focal necrosis of the pancreas was limited to two anatomical areas of the retroperitoneal tissue. With wide midline laparotomy or lumbotomy, two types of drainage were used. The first was called "open" and involved the use of gauze swabs and double-lumen drains of 11 mm in diameter to drain the unclosed surgical wound. The second was called "closed" and involved drainage of the retroperitoneal tissue and abdominal cavity while the omental bursa was intact. The "closed" drainage method was used for the operation only three weeks or more after the onset of the disease, provided that sequestra had completed forming in the pancreatic necrosis focus and an exhaustive

necrosequesrectomy had been performed. After double-lumen drains were installed in the area of the necrosis focus, the surgical wound was completely closed. In the early stages of the disease (7-14 days after the onset of acute pancreatitis), when the destructive areas of the pancreas were not yet completely sequestered, the method of "open" drainage was used to avoid purulent-septic complications of severe acute pancreatitis (SAP). This usually required small laparotomies to open the omental bursa and remove necrotic tissue. Then an omentobursostomy or retroperitoneostomy had to be made. Necrosequesrectomy was performed using double-lumen drains and latex-gauze tampons. Thus, when planning subsequent operations and in cases of serious damage to the pancreas and retroperitoneal region, the use of "open" drainage was justified. Repeated debridement operations included replacement of gauze swabs, lavage of cavities, removal of necrotic tissue, management and correction of drains and assessment of drainage efficiency. On average, one patient with focal infected pancreatic necrosis underwent two to three debridement operations, and if the necrosis spreads, three to five operations. After complete necrosequesrectomy and formation of granulations in the wound, complete closure of the surgical wound was performed, switching to a closed type of drainage. Patients with infected pancreatic necrosis (group B) had the highest mortality rate, amounting to 14.8% of all studied groups. Subgroup B2, which underwent open surgical interventions, showed the highest mortality rate (26.5%) in this group. In patients of group A with aseptic necrosis of the pancreas, the mortality rate was 9.3%, and in patients of group A2 with open surgeries, the mortality rate was 17.1%. Based on the above data, the highest number of deaths occurred in subgroup B2, where open interventions were performed, due to complications of PRP, such as erosive bleeding and retroperitoneal phlegmon. However, the mortality rate in subgroup B1 (19.5%), where minimally invasive interventions were used, was statistically significantly lower. In groups A and B, there were statistically significant differences in the duration of treatment in the operating room and the time of hospital stay.

Comparison of patients in subgroup A2 with aseptic pancreatic necrosis and patients in subgroup B2 with infected pancreatic necrosis showed no statistically significant differences in the duration of treatment in the operating room and the length of hospital stay ( $p > 0.05$ ). In addition, no statistically significant differences were found between subgroups A3 with aseptic pancreatic necrosis and subgroup B1 with infected pancreatic necrosis ( $p < 0.05$ ). However, in subgroup A3, where minimally invasive interventions were used, the duration of treatment in the operating room and hospital stay were statistically significantly shorter than in subgroup B2. Comparison of mortality showed statistically significant differences between subgroups A2, in which open surgeries were performed for aseptic pancreatic necrosis (16.3%), and subgroup B2, in which open surgeries were also performed for infected pancreatic necrosis ( $p < 0.05$ ). The mortality rate in subgroup B2 was 25.8%, which is significantly higher than in subgroup A2, where it was 17.2%. In subgroup B1, infected pancreatic necrosis was treated using minimally invasive procedures, and the mortality rate was 26.5%. This was significantly higher than in subgroup A3, where the same methods were used to treat aseptic pancreatic necrosis, and the mortality rate was 6.2%.

## CONCLUSIONS

1. Minimally invasive interventions are widely used in the treatment of severe acute pancreatitis in the enzymatic phase, in addition to conservative therapy. The choice of surgical tactics depends on the type and severity of the underlying pathological process. Minimally invasive

surgeries are preferable for drainage of the abdominal cavity at the early stage of enzymatic peritonitis.

2. Open surgeries should be considered only in case of serious complications that cannot be controlled by minor invasive procedures at the initial stage of severe acute pancreatitis. In case of purulent-septic complications, open surgeries are preferable to completely cleanse the inflammation site.

3. In the treatment of patients with aseptic severe acute pancreatitis, the use of minimally invasive procedures is accompanied by a lower mortality rate of 6.2% compared to open surgeries, which reach 17.2%. In cases of infected pancreatic necrosis, minimally invasive interventions are also preferable, since the mortality rate is 19.8%, which is lower than with open surgeries, where this figure was 26.5%.

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