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Research Article

On the Optimization of Surgical Tactics for the Treatment of Patients with Sterile Pancreatic Necrosis Using Endosurgical Technologies

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Abstract

Objective: Based on the analysis of the immediate results of treatment of patients with acute pancreatitis, to develop the optimal surgical tactics for sterile pancreatic necrosis.

Materials and Methods: Destructive pancreatitis was diagnosed in 504 people out of 1 751 patients (28.8%) with acute pancreatitis treated in the last 5 years in our clinic. The diagnosis of pancreatic necrosis was established on the basis of clinical, laboratory and instrumental (ultrasound, computed tomography, laparoscopy) research methods.

Results: All patients with severe forms of pancreatitis were hospitalized in the intensive care unit and intensive care unit, where, against the background of constant monitoring of vital constants, they performed systematic conservative treatment. If it was not effective, then the next step was to use early (in the first 3 - 5 days) surgical treatment. in 125 people (57.7%) who underwent laparoscopic interventions. Such treatment was successful in 77 patients (61.6%), in which stabilization of the patients was achieved. In 48 patients (38.4%), after laparoscopic debridement and abdominal drainage, despite the therapy, the inflammatory process in the pancreas progressed, and they had to perform open laparotomic operations. The surgical tactics we used for the treatment of necrotizing forms of acute pancreatitis made it possible to significantly reduce the incidence of postoperative complications (up to 49.8%) and mortality (up to 28.5%).

Conclusion: The results of the study showed that in most patients with a sterile form of necrotizing pancreatitis, early low-traumatic interventions should be used. It should also be noted that severe forms of acute pancreatitis require the use of a multidisciplinary treatment strategy that must be individualized for each patient.

Keywords: *Acute Pancreatitis; Surgical Approach; Laparoscopy of Sul Technology*

Introduction

In recent years (2012 - 2017 g.X) of Russia to Ministry of Health in the country are hospitalized every year 150,000 - 180,000 patients with acute pancreatitis with total mortality in 2,1 - 2,74% and postoperative in the 8 - 18%. In the structure of hospitalized patients, both in our country and abroad, about 20% are patients with a necrotizing form of acute pancreatitis, of which about 50% have a sterile form of the disease [1-3]. There are fundamental differences regarding the differentiated surgical treatment of sterile pancreatic necrosis or

infected forms. They concern, first of all, determination of indications for various types of treatment, optimal terms of surgical intervention, accesses, methods of operations on the pancreas, biliary system, drainage methods in the retroperitoneal space and abdominal cavity.

The occurrence of purulent complications in patients with pancreatic necrosis almost always means the need for surgical intervention. This invasive approach is associated with a high level of complications (from 34 to 95%) and death (11 - 39%) and with the risk of serious long-term consequences, primarily due to insufficient pancreatic functions, especially in the form of diabetes mellitus [4,5]. Its dynamics, as you know, worsens over time. In addition, secondary complications of diabetes have a significant impact on quality of life and, potentially, on its duration. In this regard, the tasks become obvious, the solution of which is aimed at improving the quality of treatment of acute pancreatitis in order to reduce the number of transitions of sterile forms of pancreatic necrosis to infected ones and reduce the number of surgical interventions leading to undesirable outcomes of the disease [6-8].

Materials and Methods

Over the past five years, in our clinic on the basis of the Chelyabinsk OKB No. 3, 1,751 patients with acute pancreatitis were treated, of which 217 were operated on (12.4%). During hospitalization of patients in a hospital on the basis of the protocol of examination and treatment of patients with acute pancreatitis, a stratification of the severity of the patient's condition was carried out to identify its severe forms. Destructive pancreatitis was diagnosed in 504 people (28.8%). All of them underwent an ultrasound scan (ultrasound) of the abdominal cavity. The pancreas was visualized in 311 people (61.7%). The main ultrasound sign was an increase in the size of the pancreas due to its inflammatory edema. The size of the pancreatic head was increased in 85 cases (27.4%), the body size in 133 patients (42.7%) and the increase in the size of the tail in 77 patients (25%). Mixed echogenicity of the pancreas corresponding to the ultrasound picture of destructive pancreatitis was noted in 167 people (53.8%). Wirsung duct expansion (from 3 to 6 mm) was detected in 38 patients (12.2%). Free ultrasound fluid in the abdominal cavity was found in 287 patients (92.3%), of which 52 were cases in the stuffing bag cavity (16.7%). The gall bladder was examined in all patients (if any). Signs of biliary hypertension were detected in 47 patients (15.2%). The gallbladder wall was thickened (more than 3 mm) in 16 patients (5.2%), cholelithiasis was present in 84 patients (26.9%). All 504 patients with destructive pancreatitis underwent contrast spiral computed tomography at various times from the time of hospitalization. In 446 people (88.5%), pancreatic tissue destruction was diagnosed, while the remaining 11.5% showed signs of acute pancreatitis. In a laboratory blood test in the first two days from the time of hospitalization, the amylase content (norm 80 - 100 U/L) to the level of 400 U/L was found in 310 (61.6%) patients, from 400 to 1,000 U/L in 96 (19.2%), over 1000 U/L - the same is for 96 people (19.2%). Blood sugar levels of up to 10 mmol/L were observed in 388 patients (77%), from 11 to 20 mmol/L in 116 (23%). The bilirubin content in the majority of patients (80.6%) was determined within the normal range. Of particular interest is the analysis of creatinine in the blood, due to the fact that a number of studies have proved that its high numbers are a reliable predictor of postoperative mortality [1,3]. In our observations, creatinine up to 70 μmol/L was found in 233 people (46.2%), from 71 to 150 μmol/L in 174 (34.6%) and from 151 to 300 μmol/L in 96 patients (19.2%). When studying the content of C-reactive protein (0.1 - 1 mg/L norm), its concentration up to 50 mg/L was in 78 patients (15.4%), from 51 to 100 mg/L in 116 (23%), from 101 to 200 mg/l in 78 (15.4%), from 201 to 400 mg/l in 155 (30.8%) and over 401 mg/l in 78 patients (15.4%). The indicators of the procalcitonin test (PCT - the norm is 0.1 ng/l) are very reliable, which, in combination with clinical data, can confirm or refute the presence of purulent complications of acute pancreatitis. So, in our patients, PCT up to an indicator of 0.2 ng/l was in 57 patients (11.5%), at a level of 0.3 - 1.0 ng/l in 213 (42.3%) and more than 1, 1 - 1.5 ng/l in 233 patients (46.2%). Thus, it can be seen from the data that the diagnosis of acute destructive pancreatitis based on clinical, laboratory and instrumental data was established in all patients, as a rule, in the first 48 hours from the time of their hospitalization.

Statistics

The research results were statistically processed using the Statistica 6.0 program (StatSoft, GS-35F-5899H). Qualitative nominal features were described as relative frequencies and expressed as a percentage.

Results

All patients with severe forms of pancreatitis were hospitalized in the intensive care unit and intensive care unit, where, against the background of constant monitoring of vital constants, they underwent systemic treatment, including adequate analgesia (using epidural anesthesia), intravenous infusions of electrolytes, plasma substitutes, and, if necessary, catecholamines (dopamine, dobutamine), mechanical ventilation with positive pressure at the end of exhalation, extracorporeal detoxification (hemofiltration, plasmapheresis), nutritional support, etc. We believe that conducting excessively aggressive infusion therapy leads to retroperitoneal accumulation of fluid, and this can contribute to an increase in intra-abdominal pressure (more than 12 cm water column). Preservation of intra-abdominal hypertension is a precursor to the onset of compartment syndrome. For its prevention and treatment, non-invasive strategies were used that led to a decrease in intra-abdominal pressure: enteric decompression through gastric or rectal probes, strict control of the intravenous regimen and fluid volume to the level of zero balance, drug reduction of muscle tension in the anterior abdominal wall, etc. Antibiotic therapy in these patients, as a rule, are not used.

If non-invasive treatment options for necrotizing pancreatitis were not effective, then the next step was surgical treatment. His main ideology was considered (in the absence of signs of infected necrosis, especially in the first week after admission to the hospital) to avoid the opening of the retroperitoneal space in order to minimize the risk of pathogens entering it [1-5]. For this, "closed" methods of surgical interventions were used, involving the active drainage of the omental sac cavity or the abdominal cavity under conditions of their anatomical integrity. This was achieved by laparoscopic implantation of 2 and/or 3 luminal silicone drainage structures for the introduction of antiseptic solutions fractionally or continuously drip to the pancreas, followed by active aspiration of liquid media. So, in the first week from the onset of the disease, 125 people (57.7%) underwent laparoscopic interventions. The indications for them were the presence of enzymatic peritonitis (based on clinical and instrumental data of the study) and the existing phenomena of multiple organ failure in sterile forms of pancreatic necrosis. The scope of the procedure included the removal of toxic exudate, direct pancreatoscopy, both to verify the form of the disease and to install a flushing system in order to conduct local dialysis of the stuffing bag. Hemorrhagic exudate in the free abdominal cavity was found in almost all patients (94.3%). A large number of it (more than 1000 ml) was in 46 people (36.8%), a moderate amount (from 500 to 1000 ml) in 48 (38.4%) and a small amount (less than 500 ml) was in 31 patients (24,8%). With direct pancreatoscopy, pathological fluid in the cavity of the omental bursa was detected in 112 patients (88.9%). The pancreas was examined in 103 cases (83%). In the remaining patients, it was not possible to fully visualize it due to the pronounced adhesive process in the cavity of the stuffing bag, the presence of a large amount of adipose tissue, which prevents the differentiation of pancreatic tissue against its background. The lobular structure of the pancreas was absent in all patients. Steatonecrosis plaques on the surface of the organ were found in 76 patients (61.7%). Similar formations in the free abdominal cavity were found in 81 people (64.8%), and fibrin in the abdominal cavity was present in 6% of patients. Liquid accumulations in the retroperitoneal fiber were diagnosed in 47 patients (37.5%). In no case were indications found for their drainage. Signs of biliary hypertension were noted in 10 cases (8.2%). The intervention was completed by installing tubular drains for local dialysis of the stuffing bag. The dissected gastrocolic ligament was sealed with a hernial stapler. The abdominal cavity was drained to all patients. If necessary, relaparoscopy was performed. Such treatment was successful in 77 patients (61.6%), in which it was possible to achieve stabilization of the patients' condition and limit the amount of surgical treatment to laparoscopic procedures only. In 48 patients (38.4%), after laparoscopic debridement and drainage of the abdominal cavity, despite the therapy, the inflammatory process in the pancreas progressed, and they had to perform open laparotomic operations.

Discussion

The presence of existing one - or multiple organ failure, resistant to ongoing complex therapy, is one of the indications for surgical treatment of acute pancreatitis. Expanded surgical interventions do not provide a significant advantage in terms of mortality, and therefore, they should only be considered as the last resource in patients for whom conservative treatment is not conducive to a clear improvement. It should be borne in mind that indications for surgery in patients with pancreatic necrosis should be based more on the

need to control the focus of the disease than the inflammatory process itself. The laparoscopic approach with sterile forms of pancreatic necrosis is attractive because of its potential to obtain all the advantages of minimally invasive technologies, while maintaining access to the entire abdominal cavity, as well as retroperitoneal space, the availability of technical feasibility, if necessary, other treatment methods (cholecystectomy, intervention on the bile ducts). The surgical tactics we used for the treatment of necrotizing forms of acute pancreatitis made it possible to significantly reduce the incidence of postoperative complications (up to 49.8%) and mortality (up to 28.5%).

At the same time, early laparoscopic technologies for sterile pancreatic necrosis are far from always used by surgeons, some of whom fear the spread of infection, worsening of patients with pneumoperitoneum in unstable patients, and the possibility of iatrogenic intestinal perforations. However, our quite satisfactory direct results of applying this approach for sterile pancreatic necrosis, taking into account the available publications on this problem [1-5], allow us to recommend this treatment tactic.

Conclusion

From the above it can be seen that in most patients with the sterile form of necrotizing pancreatitis, we successfully used early low-traumatic interventions. It should also be noted that severe forms of acute pancreatitis require the use of a multidisciplinary treatment strategy that must be individualized for each patient. Its optimal option is a staged treatment involving, in addition to surgeons, specialists in radiation diagnostics and extracorporeal detoxification, endoscopists, anesthetists and resuscitators, clinical pharmacologists, nutritionists and others.

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