

THE RESULTS OF THE PANCREATODUODENECTOMY IN THE SPECIALIZED DEPARTMENT OF A GENERAL HOSPITAL

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BACKGROUND	Pancreatoduodenal resection (PDR) is the only radical method of treatment in patients with malignancies of the head of pancreas, terminal part of the common bile duct, duodenum, and major duodenal papilla. That is why the demand for this operation is very high.
PURPOSE OF THE STUDY	To reason the possibility and necessity of PDR in a general hospital.
MATERIAL AND METHODS	We studied 55 patients aged from 29 to 75 years who had undergone PDR. In 27 (49%) patients, cancer of the head of pancreas was an indication for surgery. The tumor of the terminal part of the common bile duct was diagnosed in 12 (21%) cases, major duodenal papilla – in 2 (3%) cases. Complicated chronic pancreatitis was the indication for operation in 15 (27%) cases.
RESULTS	Postoperative complications were mild or average, lethal outcomes did not occur. Failure of the pancreatic-digestive anastomosis was the most common complication (8 patients). Most postoperative complications have been cured by mini invasive methods.
CONCLUSION	PDR is possible, and in many cases advisable to be performed in a multidisciplinary institution, with relevant experience and technical equipment, as it provides much greater possibilities of treatment for both surgical and non-surgical complications.
Keywords:	pancreatoduodenal resection, cancer of the head of pancreas, chronic pancreatitis, failure of the pancreatic-digestive anastomosis, pancreatic fistula, gastric stasis.

HP – head of pancreas

MDP – major duodenal papilla

PDE – pancreatoduodenectomy

INTRODUCTION

A pancreatoduodenectomy (PDE) is the only radical treatment of malignant tumors of the pancreatic head (HP), the terminal part of the common bile duct, duodenum and the major duodenal papilla (MDP). In chronic pancreatitis, invasion of the gastric tumor into the pancreas head, PDE is much less performed.

The need for PDE is extremely high. According to publications in the literature, we can say that the radical surgical treatment is performed in a minority of patients with such indications [1, 2]. The initial stage of pancreatic cancer is diagnosed in 10-30% of cases, while radical treatment is only possible in 10% of patients [3, 4]. For example, in the US more than 29.000 new cases of pancreatic adenocarcinoma are revealed annually. Of these patients, only 10-20% have resectable tumors, while 25.000 patients (83%) die within 12 months after making the diagnosis [2, 5]. The pancreatic cancer mortality rate in Russia among men is 12.4 per 100,000 population, and 10.4 per 100,000 population among women. In 2012, mortality of pancreatic cancer was 5.4% (6th place) among men, and 5.9% (6th place) among women [6, 7].

Throughout the history of the development of pancreatic resection surgery the major cause of postoperative mortality is the failure of pancreatodigestive anastomosis [8, 9]. The mortality after the PDE is 3-20% and depends on the experience of the medical institution, but the incidence of complications, even in specialized centers remains significant – 18-54% [10-12]. The pancreatodigestive anastomosis failure is the most common complication of PDE, which leads to the development of pancreatic fistula in 5-40% of cases according to recent data [13, 14], in most cases successfully treatable conservatively [15]. When the conservative treatment is not effective, the failure of pancreatodigestive anastomosis is a trigger for the development of other

complications requiring urgent re-laparotomy (diffuse peritonitis, bleeding). Re-laparotomies in PDE complications are mortal in 40-80% [16]. Other causes of death in the early postoperative period: erosive bleeding, acute ulcers, biliodigestive anastomosis failure, acute cholangitis. The premorbid background, which is observed in many patients, makes some negative contribution to the complicated postoperative course.

Currently, there are more than 200 different versions of PDE, relating both to the reconstruction phase in general and methods of each of anastomoses formation.

Aim of study: to reason PDE in a multidisciplinary hospital.

MATERIAL AND METHODS

Eight PDEs had been performed at the N.V. Sklifosovsky Research Institute for Emergency Medicine until 2009 and the number of surgeries have been growing recently. The adoption of PDE grows due to the emergence of highly qualified medical staff: there are 5 surgeons at the N.V. Sklifosovsky Research Institute for Emergency Medicine who can perform PDE; improvement of anesthesia; the emergence of new effective drugs that can inhibit the pancreatic secretion.

In 2010-2015, PDE was performed in 55 patients at the N.V. Sklifosovsky Research Institute for Emergency Medicine, 32 (58%) men and 23 (42%) women. The age of patients ranged from 29 to 75 years. The most common (27 patients, 49%) indication for surgery was the pancreatic head tumor. The tumor of the common bile duct terminal part was diagnosed in 12 (21%) cases, MDP was diagnosed in 2 (3%) cases. Chronic pancreatitis with complications (false cyst of the pancreas, compression of the terminal part of the common bile duct, Wirsung duct compression) was an indication for surgery in 15 patients (27%).

The diagnosis was set according to clinical picture, ultrasonography, CT and the level of tumor marker CA 19-9.

Due to obstructive jaundice, the first step was percutaneous transhepatic microcholecystostomy in 20 (36.4%) patients, endoscopic stent in 15 (27.3%) patients (bilioduodenal stent in 13 (23.6%) cases and cystoduodenal stent in 2 (3.7%) cases). Also, 8 (14.5%) patients underwent hepaticostomy, 3 (5.5%) – nasobiliary drainage, 2 (3.6%) – endoscopic recanalization of tumor, 2 (3.6%) – percutaneous drainage of a pancreatic cyst. Regarding decompensated pancreatic stenosis in one patient (1.8%), we performed laparotomy, gastroenterostomy on Brownian loop. In 17 (30.9%) patients, we performed more than one intervention prior to PDE. Thus, most of the patients sought medical help in the later stages of the disease. Only in 15 (27.3%) patients, the disease was detected before the development of complications.

Forty (72.8%) patients underwent the pylorus preserving PDE according to V.I. Onopriyev et al. (1982, 1983) [17] (V.I. Onopriyev, A.M. Manuylov. A method of forming a pancreato-intestinal anastomosis: No. 950342, 14.04.82). According to the accepted procedure, the operation is completed with transnasal drainage of Wirsung duct.

The other techniques of pylorus preserving PDE were performed in 5 (14.5%) patients, and in 10 (18.2%) patients, gastropancreatoduodenal resection was performed. In all cases, the operation was terminated with probe insertion into the stomach or its remnant.

There were tumors of following histologic structures: adenocarcinoma – 20 (48.8%) patients, mucinous adenocarcinoma – 7 (17.1%) patients, ductal adenocarcinoma – 11 (26.8%) patients, carcinoid – 2 (4.9%) patients, insulinoma – 1 (2.4%) patient.

The final analysis of the tumor stage was performed according to *TNM* classification (2009). It should be emphasized that there were only 9 (22.5% of the patients with malignant tumors) patients with stage II tumors, the remaining 31 (77.5%) patients had stage III or IV.

RESULTS

Postoperative complications were classified according to *Clavien-Dindo* [18]. Complications of grade I occurred in 10 (25%) patients. Complications of grade II-III were identified in 18 patients (45%). Complications of grade IV and V were not observed.

The most common postoperative complication was inconsistency of pancreatodigestive anastomosis (pancreatic fistula) in 8 patients. Assessment of the severity of pancreatic fistula was carried out in accordance with gradation, proposed by experts of the International Research Group for Pancreatic Surgery in 2005 [19]. The type A fistula was observed in 2 patients. The type B fistula was detected in 6 patients and needed partial parenteral nutrition, additional drainage of fluid accumulation under ultrasound guidance, as well as administration of somatostatin analogues. There were no type C fistulas.

In 3 patients, the postoperative period was complicated with inconsistency of biliodigestive anastomosis, which led to formation of subhepatic abscess in 2 cases, cured with drainage under ultrasound guidance or management of the drainage tube position installed during the surgery under X-ray monitoring.

In one case, we observed the anastomotic thrombosis of the proper hepatic artery after resection due to tumor invasion. We performed re-laparotomy, auto-venous replacement of the hepatic artery. Further postoperative period was uneventful.

We also observed one case of postoperative pancreatitis, one erosive gastritis, one anastomositis with partial small bowel obstruction. All complications were cured conservatively.

Gastric stasis was evaluated according to the classification proposed by the experts of the International Research Group for Pancreatic Surgery in 2007 [20]. Mild gastric stasis (A) was detected in 5 patients, moderate gastric stasis (B) was revealed in 10 patients, severe gastric stasis (C) was diagnosed in 3 patients.

Postoperative complications of the respiratory system were reported in 4 patients (3 cases of pneumonia), and in 5 patients, we observed cardiovascular complications (2 cases of thrombosis of the jugular and subclavian vein, 2 cases of paroxysm of atrial fibrillation, 1 case of repeated myocardial infarction), and one patient had decompensation of diabetes.

We report a case of effective treatment for post-operative complications. A 61-year-old male patient P. was admitted to the Institute with a clinical picture of obstructive jaundice. We knew from the medical history that the patient had had myocardial infarction. The examination revealed a volume formation in the pancreatic

head (carcinoid). In connection with biliary hypertension, the first stage of surgical treatment was percutaneous transhepatic microcholecystostomy under ultrasound guidance. After the fall of biliary hypertension, and jaundice management was pylorus preserving PDE. Acute coronary syndrome developed 24 hours after the surgery. The examination revealed acute myocardial infarction in paracardiac area of the left ventricular anterior wall. The coronary angiography revealed hemodynamically significant stenoses of the left main coronary artery (75%), the mouth of the anterior interventricular branch (90%), the proximal third of the circumflex branch (60%), the middle third of the right coronary artery (over 75%). However, the severity of state after PDE did not allow to install a coronary stent. The cardiotropic therapy arrested the pain, and restored hemodynamics to normal parameters. On the 15th day of the postoperative period we diagnosed abdominal abscess and performed percutaneous abscess drainage under ultrasound guidance (25 ml of pus evacuated). Then, 150 ml of purulent contents discharged each day. Fistulography revealed intercommunication of the abscess cavity with the lumen of the jejunum, and the contrast agent leakage into bile ducts. The diagnosed changes were regarded as a partial failure of hepato-enteroanastomosis. We performed daily rinsing of the drainage tube, complex anti-inflammatory, immunocorrecting, systemic therapy. The body temperature returned to normal, the small-intestinal fistula was closed. On the 29th day of the postoperative period, the burning cardiac pain re-occured. Given the recurrent coronary syndrome and hemodynamically significant stenoses of the coronary arteries, the patient underwent coronary angiography, installation of a stent into the right coronary artery and left main coronary artery. After that, the post-operative period was uneventful. The patient was discharged in satisfactory condition under the supervision of oncologist and cardiologist.

Two cases were lethal. It should be mentioned that lethal outcomes were associated with concomitant diseases. One patient had encephalopathy of mixed genesis, bilateral lower-lobe pneumonia, cardiovascular and respiratory failure. The other patient had acute cerebrovascular accident, a series of generalized seizures and encephalopathy of complex genesis (vascular, dysmetabolic), developed on day 1 of the postoperative period.

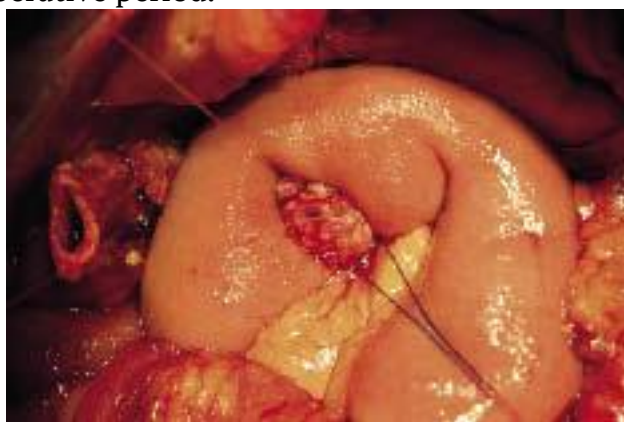


Fig. 1. Formation of end-to-loop pancreato-enteroanastomosis. The pancreatic remnant is fixed in the mesojejunum window.

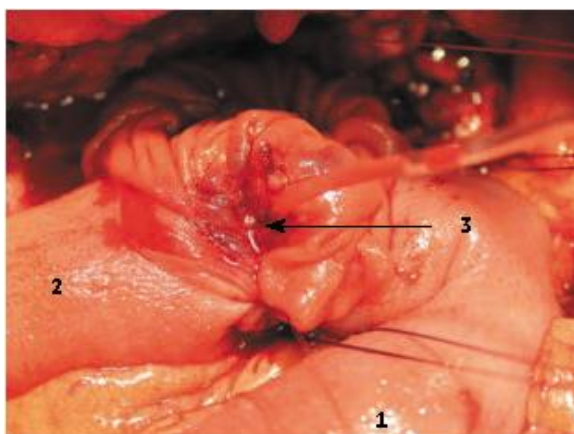


Fig. 2. Formation of end-to-loop pancreato-enteroanastomosis. The posterior wall of junction and precision Wirsung-enteroanastomosis.

1 — afferent part of the anastomosed loop of the small intestine; 2 — efferent part of the anastomosed loop of the small intestine; 3 — Wirsung-enteroanastomotic lumen

CONCLUSIONS

1. PDE is possible and in many cases advisable to be performed in a multidisciplinary hospital with relevant experience and technical equipment.

2. Pylorus preserving PDE is more physiologic operation than gastropancreatoduodenal resection, with the same number of postoperative complications.

3. The most frequent complications of pylorus preserving PDE: pancreatodigestive anastomotic failure and gastric stasis. In most patients, these complications were not life threatening and were cured with conservative and mini-invasive methods.

4. Our experience has shown that there are much greater possibilities of treatment for both surgical and non-surgical complications of PDE in a multidisciplinary hospital

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