Pancreatic fistulas are one of the most common complications of pancreatic surgery, responsible for prolonged hospitalization after the operation, increased mortality and costs of treatment. Pancreatic fistulas are observed after pancreateoduodenectomy (PD) in 6 to 14% of patients with the mortality rate ranging between 1.4-3.7%. The presence of a pancreatic fistula is associated with other complications, such as delayed gastric emptying (DGE), gastrointestinal obstruction, postoperative wound infections, intraabdominal abscesses, pancreatitis, bleeding, and sepsis. The greatest risk associated with pancreatic fistula is observed in patients after middle pancreatectomy (20-63%), while the lowest risk is observed in case of distal pancreatic resections (5%). The greatest risk after middle pancreatectomy is associated with the fact of the necessity to maintain and supply two pancreatic stumps (head and tail), which are potential location of fistula development. Additionally, the pancreatic fistula is a complication of acute pancreatitis (after necrosectomy as an external pancreatic fistula) and chronic pancreatitis (pancreaticopleural fistula) (1).

The current valid definition of pancreatic fistula is that of the International Study Group on Pancreatic Fistula from 2005, based on the amylase level in the peritoneal fluid. Pancreatic fistula is diagnosed when the amylase peritoneal fluid level is three times higher than the maximum normal blood level or three days after surgery. One may distinguish three stages of a pancreatic fistula: A, B, and C. In case of stage A the pancreatic fistula is asymptomatic and does not require treatment, reoperation, re-hospitalization, being invisible on imaging examinations (ultrasound/CT), without prolonged (>3 weeks) postoperative drainage. In case of stage B one may observe initial symptoms of infection (fever > 38°C, leucocytosis, wound exudate), the patients’ well-being is good, the pancreas being visible on ultrasound/CT with prolonged postoperative drainage. Sometimes the patient requires treatment and recurrent hospitalization, without surgery. In case of stage C, pronounced clinical symptoms are observed, including sepsis and prolonged postoperative drainage. The pancreas is visible on imaging examinations (ultrasound/CT), requiring treatment and reoperation (1, 2).

Risk factors of clinically significant pancreatic fistula (stage B and C) development after pancreateoduodenectomy include: male gender, narrow pancreatic duct (<3 mm), soft pancreatic parenchyma, Vater’s papilla or duodenal

THE ASSOCIATION OF POLISH SURGEONS ON PANCREATIC FISTULAS

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The association of polish surgeons on pancreatic fistulas pathology, cystic lesion or one originating from pancreatic isle cells, long duration of surgery, and significant intraoperative blood loss (>1000 ml). Risk factors of pancreatic fistula after distal pancreatectomy include: BMI exceeding 25 kg/m², incision of the body of the pancreatic parenchyma, and lack of additional supply of Wirsung’s duct (1, 3). According to the multicenter study published in 2011, elevated levels of peritoneal fluid amylase (exceeding 4000 IU/L) one day after surgery are evidence of the high-risk of pancreatic fistula development after surgery (4).

Based on literature data it should be noted that thus far, no consensus has been established concerning management aimed at reducing the risk of pancreatic fistula development after pancreatic surgery. Considering different surgical techniques aimed at reducing the risk of pancreatic fistula development after pancreatectoduodenectomy, there exist conflicting publications in literature data. Amongst these techniques, one may mention the anastomosis of the stump of the pancreas with the posterior wall of the stomach (pancreatogastrectomy, according to Clagett and Flautner), external drainage of Wirsung’s duct and duct-to-mucosa anastomosis (according to some authors—better than pancreatic stump intussusception, while others consider pancreatic fistula incidence as equal in case of both methods). Some authors proposed total pancreatectomy in patients with high-risk pancreatic fistula, which leads to permanent intra- and extra-secretory pancreatic insufficiency (1, 3). In our center in case of a wide pancreatic duct, duct-to-mucosa anastomosis is performed (end of the pancreas to side of the jejunum). In case of a narrow Wirsung’s duct pancreateojunostomy (end-to-side) is performed or pancreateojunostomy with pancreatic stump intussusception. In our center Wirsung’s duct external drainage is also performed.

In order to reduce the incidence of pancreatic fistula development after distal pancreatic resections, apart from the manual suture, other surgical techniques were proposed including stapler pancreatic closure, anastomosis of the pancreatic stump and jejunal loop, mesh plasty, the patch technique or the use of fibrin glue (5-13). The European multicenter randomized clinical trial demonstrated that there was no difference considering the incidence of pancreatic fistula and other surgical complications, between manual and stapler sutures, 32% and 28%, respectively (14). According to a study published in 2013 the use of a stapler for the closure of the pancreatic section thicker than 12 mm in patients subjected to distal pancreatectomy increases the risk of pancreatic fistula development (15).

In case of distal pancreatectomy, in order to reduce the risk of pancreatic fistula development, Wirsung’s duct should be identified and supplied. In our center the stump of the pancreas after distal pancreatectomy was supplied by means of a manual suture. During the preparation of the sample we tried to obtain the incision in the shape of letter V. Afterwards, we searched for Wirsung’s duct, underpinning it by means of a 5-0 absorbable monofilament suture. The stump of the pancreas was then closed by means of 4-0 monofilament mattress sutures, thus, bringing together both edges of the pancreas after the resection. Such sutures lead to the closure of the surface of the pancreatic section (5).

The prophylactic administration of somatostatin and its analogues (octreotide, vapreotide) which reduce pancreatic secretion, remains controversial, as there exist conflicting publications concerning the issue in literature data. According to most studies the prophylactic administration of somatostatin and octreotide is unjustified in most patients, as it is not associated with reduced mortality. Some authors observed benefits associated with prophylactic administration of somatostatin and its analogues in patients with risk factors of pancreatic fistula development, such as soft pancreatic parenchyma, narrow pancreatic duct, and surgical procedure due to Vater’s papilla and duodenal pathology, as well as pancreatic cysts or neuroendocrine tumors. According to a meta-analysis published in 2013 somatostatin analogues were recommended in the prophylaxis of pancreatic fistulas, since their administration reduces the risk of postoperative complications, although does not affect mortality (16). According to yet another meta-analysis published in the British Journal of Surgery (2012), the use of somatostatin analogues in patients subjected to pancreatectomy does not reduce the risk of pancreatic fistula development, as compared to other therapeutic methods (19). According to most investigations somatostatin is administered prophylactically by means of a continuous
infusion, at a dose of 250 mcg/h for a period of 7 days, while octreotide is administered subcutaneously, at a dose of 3x100 µg. It should be emphasized that thus far, no uniform therapeutic standard has been elaborated (indications, duration of treatment, dosage), considering the prophylactic administration of somatostatin and its analogues in case of patients after pancreatectomy (1, 3, 16-19). In May 2014, a work on the use of a new somatostatin analogue pasireotide in the perioperative prevention in pancreatic surgery was published (20).

A pancreatic fistula should be suspected in case of a patient complaining of abdominal discomfort, coexisting fever, tachycardia, leucocytosis, delayed gastric emptying, and postoperative wound infections. The laboratory confirmation of a pancreatic fistula is a threefold increase in the activity of amylase, three or more days after surgery. Routine diagnostics after surgery is not recommended, if there is no such need. In the presence of the above-mentioned symptoms radiological diagnostics is recommended: abdominal ultrasound (intraperitoneal fluid evaluation) followed by abdominal CT. When suspecting pancreatic fistula presence after distal pancreatectomy or during the course of chronic pancreatitis, imaging examinations should be performed, in order to visualize the pancreatic duct injury. Magnetic resonance cholangiopancreatography (MRCP) is a non-invasive examination, while endoscopic retrograde cholangiopancreatography (ERCP) is an invasive procedure (1, 2, 3).

Most patients with pancreatic fistula presence are subjected to conservative treatment by means of diet „0”, intravenous hydration (in case of prolonged diet „0” exceeding 7-10 days, parenteral nutrition should be initiated). In case of patients with symptoms of infection (fever, leucocytosis, wound exudate) empirical antibiotics are administered, modified depending on the bacteriological result. In our center, intravenous ciprofloxacin 2x0.4 g and metronidazol 2x0.5 g were administered. Additionally, patients with a confirmed pancreatic fistula maintain peritoneal drainage. In addition, pharmacotherapy using somatostatin or octreotide, in order to reduce pancreatic secretion, may be initiated (1).

In the presence of a large intraperitoneal reservoir percutaneous drainage under CT control is recommended. In case of bleeding during the course of a pancreatic fistula, angiography or vascular embolization are recommended (1).

In the absence of the possibility or efficacy of less invasive procedures surgical management of large fluid reservoirs is recommended (intraperitoneal abscesses). Relaparotomy in the treatment of pancreatic fistulas is rarely performed, usually when suspecting pancreaticojejunostomy dehiscence in patients with large fluid reservoirs (intraabdominal abscesses with sepsis and multiorgan failure). Surgical treatment of pancreatic fistulas includes reservoir drainage (intraperitoneal abscesses), revision, closure, and re-pancreaticojejunostomy (in the absence of abdominal infection), or elimination of the pancreaticojejunostomy and removal of remaining pancreatic parenchyma. The surgical drainage of fluid reservoirs (intraperitoneal abscesses) is effective, only in patients with insignificant pancreatic fistulas. In case of pancreaticojejunostomy dehiscence, total pancreatectomy is recommended (1).

Surgical treatment is indicated in case of ineffective non-invasive therapy (conservative or endoscopic) of the pancreaticopleural fistula during the course of chronic pancreatitis. Distal pancreatectomy with subsequent pancreaticojejunostomy (Roux-Y method) are usually performed. One should strive to maximally save the pancreatic parenchyma (20).

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