

Surgical Drainage versus Endoscopic Drainage in Pancreatic Pseudocyst

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Abstract: Pancreatic pseudocyst (PP) is an intra or peripancreatic fluid collection, without an epithelial coating, containing pancreatic juice rich in proteolytic enzymes, without clinical signs of infection. It is one of the most frequent complications of acute and chronic pancreatitis, patients with these disorders often benefit from interventional therapy, surgical or minimally invasive. We compared results obtained by open surgery with endoscopic treatment in 20 patients with pancreatic pseudocyst, admitted in Craiova Surgery I Clinic in the period 2006-2011. In 13 patients (65%) the endoscopic drainage was attempted and was successful in 10 (76.7% efficiency). Failure was due to puncture site bleeding, thick wall of PP or abundant collateral circulation. Endoscopic drainage consisted in transgastric drainage (5 cases), transduodenal in (3 patients) and transpapillary by ERCP (2 patients). Conventional surgery was required in 8 patients (40%), 7 of them as elective surgery and one in emergency due heavy bleeding after endoscopic internal drainage attempt. We practiced 4 pseudocyst-gastrostomy, 3 pseudocyst-jejunostomy and 3 external drainage (2 patients with dual localization of PP). There was a severe postoperative complication - upper gastrointestinal bleeding from the splenic artery which required reintervention. Results were positive by both therapeutic approaches, with differences in the number of days of hospitalization, patient comfort and post interventional evolution in favour of endoscopic approaches.

KEYWORDS: *pancreatic pseudocyst, surgical drainage, endoscopic drainage*

Introduction

Pancreatic pseudocyst (PP) is a fluid collection intra or peripancreatic, without its epithelial coating, containing pancreatic juice rich in proteolytic enzymes without clinical signs of infection. It is bordered by inflammatory tissue surrounding anatomical structures, the wall being formed of a fibrous and granulation tissue derived from parietal and visceral peritoneum. Pancreatic pseudocyst is one of the most frequent complications of acute and chronic pancreatitis, patients with these disorders often benefit from interventional treatment, minimally invasive or classic surgery, if symptomatic

Our aim is to compare in terms of immediate postoperative results two therapeutic approaches completely different: endoscopic and open surgery.

Materials and methods

We compared the results obtained by open surgery and endoscopic treatment in the case of 20 patients with pancreatic pseudocyst, admitted in Craiova Surgery I Clinic in the period 2006-2011.

The study is retrospective, the data being collected from patients' observation charts. Interventional treatment was necessary due to

increased PP size over 6 cm, PP symptoms, digestive and bile ducts compression.

Thus, these patients presented with abdominal pain (19 patients - 95%), nausea and vomiting (16 patients - 80%), palpable tumor, abdominal pain (11 patients - 55%), jaundice (4 patients - 20%), weight loss, signs of upper gastrointestinal bleeding, anemia, fever, and chills.

PP etiology was alcoholic in 9 cases (45%), billiary in 7 cases (35%), idiopathic in 4 cases (20%). PP diagnosis was made on clinical signs and confirmed by imaging: ultrasound, CT, ERCP and endoscopic ultrasound.

Results

In 13 patients (65%) the endoscopic internal drainage was tempted, and was successful in 10 patients (76.7% efficiency). At the other 3 patients endoscopic approach failed due to puncture site bleeding, thick wall PP, viscous contents of PP or high collateral circulation, reducing the intervention to only aspiration biopsy. In one case, bleeding from the puncture site was important, endoscopic attempts for hemostasis were unsuccessful and the case required emergency surgery for hemostasis and surgical treatment of PP. Of the 10 cases with endoscopic drainage, in 5 patients was performed transgastric drainage with guided endoscopic ultrasound for choosing optimal

punction site. In 3 patients transduodenal drainage was performed and 2 patients underwent transpapillary drainage by ERCP for a PP communicating with the pancreatic ducts. Drainage efficiency was observed immediately by leaks through the catheter mounted and subsequently reducing size of PP, symptom relief and reducing mass effect on the digestive tract and bile ducts.

Conventional surgery was required in 8 patients (40%), 7 of them as scheduled surgery and one emergent surgery because of heavy bleeding after endoscopic internal drainage attempt. We performed 4 cyst-gastrostomy by transgastric approach, for PP located in contact with the posterior gastric wall, 3 cyst-jejunostomy for PP located below. In a patient with cyst-jejunostomy operated six days earlier, we had a postoperative complication - upper gastrointestinal bleeding manifesting by repeated melaena. Selective celiac trunk angiography was performed which revealed a leak from the splenic artery, near its origin. It imposed emergency surgery and suture of the splenic artery breach, performed without splenectomy, with subsequent favorable evolution. In 3 cases - 15% (2 patients with double PP) underwent external drainage of PP. One patient experienced a prolonged drainage of PP for 6 weeks (external pancreatic fistula), but subsequently closed. We haven't registered other complications and mortality was 0.

Discussions

Current definition of pancreatic pseudocyst delineates separate categories for intra and peripancreatic collections. The Atlanta classification of acute pancreatitis (1992) distinguishes [1]:

- intra and peripancreatic acute fluid collections occurring early in the evolution of acute pancreatitis, lacking fibrous wall;
- acute pseudocyst consists of pancreatic juice, delimited by a fibrous wall and granulation tissue, occurring as a consequence of acute pancreatitis;
- chronic pseudocyst occurring in the evolution of chronic pancreatitis in the absence of an acute episode of acute pancreatitis;
- pancreatic abscess is a circumscribed collection of pus, usually in proximity to the pancreas, a consequence of acute pancreatitis/pancreatic trauma or chronic pancreatitis.

Differentiation of these entities is important in terms of evolution, because fluid collection

can be only stage of this process, approximately 30% of patients have these collections in acute pancreatitis, but only 5% of them will develop a pseudocyst [2]. The key difference between fluid collection and pseudocyst is existence of a well defined fibrous wall, with granulation tissue.

Thus, it is believed that after 4 weeks [3] from the onset of acute pancreatitis, persistent fluid collections present a defined wall that they classify as pancreatic pseudocysts.

Considering the clinical and laboratory criteria we have currently seems simple diagnosis of pancreatic pseudocyst. However, diagnostic certainty is given by histopathology, showing absence of endocyst epithelium.

PP is usually small asymptomatic or oligosymptomatic, only finesse imaging (CT, endoscopic ultrasound, ERCP) can reveal. Usually the clinical picture of pancreatic pseudocyst is outlined when it increases in size, when compressing nearby organs or cause complications.

The clinical presentation is not specific for PP, making clinical diagnosis difficult and explains the error rate of diagnosis based only on clinical examination.

Pancreatic pseudocyst development may have a variable evolution depending on its size, type acute or chronic, PP age and its complications (bleeding, compression, fracture, infection, etc). He can develop in three directions: spontaneous resolution, to persistence or complication.

There are many factors [4] that influence the rate of spontaneous PP resolution: - pseudocyst type: percentage of spontaneous resolution in type I post necrotic cyst (after acute pancreatitis) is higher compared with type III retention cyst

- lesions of chronic pancreatitis with stricture or pancreatic ducts damage adversely affects the rate of resolution.

- multiple pseudocysts have a little chance of spontaneous resolution

- caudal location of PP have less chance to spontaneous resolution [5]

- increased wall thickness of pseudocysts (> 1cm) reduce chances of spontaneous resolution and becomes one of the factors that require surgery [6]

- Billiary, posttraumatic or postoperative etiology of PP decreases the chance of spontaneous resolution through injury and obstruction of pancreatic ducts

- PP persistent more than 6 weeks decreases the chances of spontaneous resolution, although cases have been cited for PP resolution at 6 months after diagnosis.

- Increasing size of PP during monitoring and PP size over 6 cm have a small chance for resolution.

PP complications are multiple and consist of:

1. intracyst, intraperitoneal or digestive tract bleeding
2. rupture of PP in a hollow organ, in the peritoneum and more rarely in the pleura, pericardium or creation of external fistulas
3. infection
4. pleurisy, pericarditis, ascites
5. compression to digestive tract (stomach, duodenum, colon) or biliary tract
6. compression to vascular tract (portal vein, mesenteric, splenic) with portal hypertension
7. pseudo aneurisms
8. calcification.

Treatment of pancreatic pseudocysts is differentiated according to the type, size, location, evolution, presence or absence of complications, and least but not last, the patient's general condition and available treatment options.

It is based on two components: supportive drug treatment and interventional therapy (surgical or miniinvasive therapy).

Interventional treatment of PP has many ways of drainage:

1. external drainage, ultrasound or CT guided
2. endoscopic drainage, transmural or transpapillary
3. surgical internal drainage, classic or laparoscopic (cyst-gastrostomy, cyst-duodenostomy, cyst-jejunosotomy)
4. surgical external drainage, classic or laparoscopic
5. pancreatic-cyst resection or excision of PP

Interventional treatment goals are represented by draining a PP in a digestive lumen or external drainage. This treatment is indicated in complicated PP with persistent symptoms, with increasing size during monitoring, infected PP and PP suspected for malignancy.

The factors that influence the choice of interventional treatment of PP are:

- severity of acute pancreatitis
- etiology of acute pancreatitis (alcoholic or biliary)
- patient's age and general condition
- PP characteristics: size, number, location, cyst wall, PP content

- therapeutic options available and experience of the multidisciplinary team (surgeon, interventional endoscopist, radiologist)

Endoscopic internal drainage (transmural or transpapillary)

The goal of this drainage method is to make a communication between PP cavity and digestive lumen (stomach, duodenum), transmural or transpapillary by ERCP. This approach is preferred because it is less invasive than traditional surgery, with comparable results and lower morbidity and mortality. Transmural drainage technique involves puncture of PP with 19-22G needle, collecting material for bacteriological and cytological study, inserting a guide wire, balloon dilation (8-10mm) and introduction of one or two double pigtail catheters 7-10 Fr. Endoscopic ultrasound is useful to evaluate the distance between PP and digestive lumen, wall thickness, content of PP or collateral circulation.

Endoscopic drainage is indicated [7, 8] in:

PP in contact with the lumen of the stomach or duodenum

defined PP wall (> 5mm)

fluid content of PP

Transmural drainage contraindications (7) are:

- distance > 1 cm from the digestive lumen to PP, by ultrasound measure
- debris and viscous content of PP
- intracyst bleeding
- important collateral circulation or pseudo aneurysm
- PP communicating with the pancreatic duct (indication for transpapillary drainage)

Endoscopic drainage is an effective treatment method and has positive results in 90% of cases [9, 10, 11, 12]

Transpapillary drainage of PP is indicated in cephalic PP communicating with pancreatic duct, showed through ERCP or MRCP. Most of cephalic PP has ductal system communication, especially when we encounter chronic PP and ductal stenosis. Transpapillary drainage technique involves catheterization of duodenal papilla, inserting a guide wire that exceeds ductal stricture or solution of continuity, then positioning a 5-7 Fr stent and control it. Stenosis may require dilatation of the pancreatic duct and extraction of common bile duct lithiasis and papilofinctorotomy, with risk represented by an acute onset of acute pancreatitis. Transpapillary drainage technique is more difficult, requiring

experienced endoscopist. This approach can be made complementary to surgical drainage.

Surgical drainage

Until the development of endoscopic methods, internal or external surgical drainage was the main way to treat the PP. Surgery remains the main method if PP is large (over 6 cm), complicated and represent the only option for intrapseudocyst debris and failure of endoscopic treatment.

The goal of intervention is to realize a communication between PP cavity and digestive lumen. Stoma should be located to maximize the chances for complete resolution of PP, it remains functional for several months.

Indications for surgical treatment are:

- PP associated with multiple or complex strictures of the pancreatic duct
- contraindication or failure of endoscopic methods
- recurrent PP
- multiple PP
- bleeding PP
- infected PP
- PP compression on CBP, stomach, duodenum or large vessels
- pancreatic ascites or pancreatopleural fistula
- associated pancreatic pathology that require surgical treatment
- suspicion of malignancy

Surgical drainage methods are:

- external drainage,
- cyst-gastrostomy by classic or laparoscopic approach
- cyst-duodenostomy
- cyst-jejunostomy
- transduodenal papilofinctorotomy and transcanalar drainage of PP
- PP excision and pancreaticcyst resection.

Internal drainage of PP calls the existence of a defined wall of the cyst, fit for a safe anastomosis. Therefore it is sometimes preferable to wait until 4-6 weeks, necessary for a matured PP wall.

Laparoscopic approach of PP is a relatively recent acquisition in the therapeutic arsenal of PP, especially in experienced centers in laparoscopic surgery. The method benefits from the known advantages of minimally invasive laparoscopic surgery. [13, 14, 15]

Conclusions

Results were positive by both therapeutic approaches, with differences in the number of days of hospitalization, patient comfort and post

interventional evolution in favour of endoscopic approaches.

PP may occur in acute or chronic pancreatitis evolution, regardless of its etiology. Diagnosis of PP is made by imaging methods: ultrasound, CT, endoscopy ultrasound.

Small and asymptomatic acute PP is treated conservatively, in the hope of spontaneous resolution.

Indications for endoscopic internal drainage of PP: mature wall of PP, fluid content, situated near a digestive lumen. Is accompanied by a reduced morbidity and mortality compared with conventional surgery.

External drainage of PP should be avoided because of the risk of developing a pancreatic fistula.

Surgical internal drainage remains the only therapeutic option after failure of endoscopic treatment, infected PP, PP complicated by intracyst bleeding.

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