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Multiple orifices are better than single in the endoscopic treatment of pancreatic pseudocysts

PANCREAS

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Original Article

ABSTRACT

Background/Aims: The aim of this study was to compare the surgical drainage of large, symptomatic pancreatic cysts (>5 cm) with single- and multi-channel endoscopic drainage.

Materials and Methods: In the period 2005-2010, we treated 112 patients with post-inflammatory pancreatic cysts. Thirty-six patients underwent surgical internal drainage. The remaining group of patients was treated endoscopically. In 28 of them, drainage was performed by anastomosing the cyst to the gastrointestinal tract using a single pig tail drain and then widening the channel to a diameter of 15 mm. Forty-eight patients underwent multi-channel cystic drainage. It consisted of connecting the cyst to the stomach and/or duodenum using at least 3 drains. Each connection was widened to a minimum diameter of 15 mm to ensure free drainage of the morphotic elements of the cyst. Each procedure was preceded by abdominal computed tomography to determine the exact location of the cyst in relation to the gastrointestinal tract and a Doppler ultrasound scan to determine the location of the blood vessels modeling on its surface.

Results: In 48 patients with multi-channel drainage, there was no obstruction of the anastomosis, and cysts closed within 4 months. The drains were removed after about 3 months. The created channels were patent for about 3-4 weeks, which was enough to completely close the cyst.

Conclusion: Multi-channel endoscopic anastomosis of pancreatic cyst to the gastrointestinal tract is a very effective method for drainage of large post-inflammatory pancreatic cysts, comparable in terms of effectiveness with the surgical method but less invasive.

Keywords: Pancreatic cyst, multi-channel endoscopic anastomosis, Doppler ultrasound

INTRODUCTION

The first endoscopic surgery in the treatment of pancreatic cyst was described by Rogers et al. (1) in 1973. In 1984, Hersfield (2) described the first transpapillary cyst aspiration resulting in complete cure. Kozarek (3) performed cyst drainage into the stomach or duodenum with placement of an endoprosthesis in 1985. The surgical technique has substantially changed and is now considered an alternative to traditional surgery. The first low-invasive procedure was transcutaneous cyst puncture and evacuation of its contents by repeated procedures or placement of a permanent drainage in the event of cysts connected with the Wirsung's duct (4). These procedures were associated with a significant risk of complications, especially cyst infections. With the development of endoscopic techniques, the surgeons started to perform cyst drainage through the Wirsung's duct and then cyst marsupialization to the gastrointestinal tract. A prerequisite for these treatments was cyst pressure on the gastric or duodenal wall. These techniques are currently used, and the introduction of endoscopic ultrasonography enables the identification of the cyst wall in relation to the gastrointestinal tract without its pressure. The centers' many years of experience reduces the incidence of complications and

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allows them to introduce new methods for cyst drainage. One of them is multichannel anastomosis of the pancreas to the gastrointestinal tract. The starting point for this type of surgery is the fact that operative cysto-gastrostomy is associated with a varying degree of recurrence. The width of cyst anastomosis to the gastrointestinal tract is an important factor-the larger the anastomosis, the lower the recurrence rate. Based on the surgical experience, we decided to perform a similar drainage endoscopically.

Study Objective

The aim of this study was to compare the surgical drainage of large, symptomatic pancreatic cysts (>5 cm) with single- and multi-channel endoscopic drainage.

MATERIALS AND METHODS

In the period 2005-2010, we treated 112 patients with post-inflammatory pancreatic cysts. The study was approved by ethics committee, and all patients gave verbal consent. Thirty-six patients underwent surgical internal drainage of the cyst with marsupialization of the cyst to the stomach, duodenum, or jejunum on a separated intestinal loop using the Roux Y method. Indications for surgical treatment included the lack of contact of the cyst with the stomach or duodenum and the location of the inferior pole of the cyst below the mesocolon, making normal evacuation difficult. The remaining group of patients was treated endoscopically by cyst anastomosis to the stomach in 53 patients and with the duodenum in 23 patients. In 28 of them, drainage was performed by anastomosing the cyst to the gastrointestinal tract using a single pig tail drain and then widening the channel to a diameter of 15 mm. Forty-eight patients underwent multi-channel cystic drainage. It consisted of connecting the cyst to the stomach and/or duodenum using at least 3 drains. Each connection was widened to a minimum diameter of 15 mm to ensure free drainage of the morphotic elements of the cyst. Each procedure was preceded by abdominal computed tomography to determine the exact location of the cyst in relation to the gastrointestinal tract and a Doppler ultrasound scan to determine the location of the blood vessels modeling on its surface. Endoscopic ultrasound (EUS) was not performed. If computer tomography (CT) showed signs of cyst infection before the drainage procedure, the samples were taken for culture during the surgical procedure and the single-channel endoscopic procedure, and systemic antibiotic therapy with ciprofloxacin was administered for 10 days. However, in the course of the multi-channel procedure, a nasogastric tube was placed in the cyst through one of the channels for continuous rinsing of the cyst with normal saline (250 mL every 6 hours). In this case, no antibiotic therapy was used, and inflammation was monitored based on leukocytosis and C-reactive protein (CRP) levels in the patient's blood.

The effectiveness of drainage was controlled by ultrasound monitoring of the cyst size.

RESULTS

Surgical drainage of the cyst, particularly multi-channel, was very effective, and no cases of cyst recurrence were recorded. Cysts larger than 5 cm closed within 3 months. The endoscopic procedure of single-channel drainage due to obstruction of the drain connecting the cyst to the stomach was repeated in 4 patients (14.5%). Obstructed pig tail drain was replaced in 1 patient, and 3 patients underwent multi-channel drainage to improve the evacuation of the cyst contents. The average cyst closing time after single-channel drainage was 6 months.

In 48 patients with multi-channel drainage, there was no obstruction of the anastomosis, and cysts closed within 4 months. The drains were removed after about 3 months. The created channels were patent for about 3-4 weeks, which was enough to completely close the cyst.

In the case of surgical drainage, the most common complication was surgical wound suppuration in 7 patients (%) and the development of post-operative abdominal abscess in 1 patient (). In the case of single-channel drainage, obstruction of anastomosis was the most common complication, which was reported in 4 patients (%). In the multi-channel drainage group, a single complication of bleeding at the anastomosis site was reported, due to the technique being changed to surgery.

Drainage effectiveness was monitored by performing ultrasound (US) scans 1 week after surgery and then every month.

DISCUSSION

Post-inflammatory pancreatic cysts are present in 20% of patients after acute pancreatitis (5). Only 2% of them require surgical treatment. Approximately 15% of cysts are connected to the main pancreatic duct or its branches. In these cases, adequate drainage of the Wirsung's duct performed during ECPW is sufficient. In the remaining patients, cysts are isolated tanks having no contact with the gastrointestinal tract. A clinical problem is posed by so-called symptomatic cysts or those that cause pain and pressure on the digestive tract, resulting in subileus or mechanical jaundice, when they compress the hepatic ligament. Compression of the hepatic ligament is a special situation, because pressure on the portal vein results in hypertension in its drainage area. This condition leads to specific complications, including not only the consequences of portal hypertension but also activation of the rich vascular net of collateral circulation, impeding safe drainage. The size of these cysts is usually greater than 5 cm. There are no data in the literature about the incidence of symptomatic cysts, but our material shows that they are present in 6% of all patients treated for acute pancreatitis. The oldest method for treatment of pancreatic cysts is surgery. Anastomosis to the stomach (Jurasz's method) and the small intestine (the Roux Y method) is the most effective treatment. Zero percent to 5% of the treated patients experience cyst recurrence after surgical treatment.

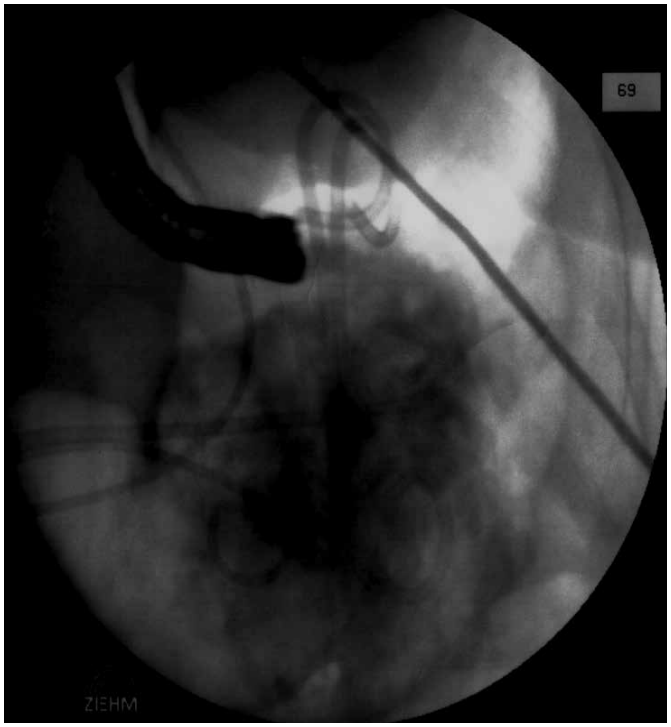

Figure 1. Multi-channel drainage of pancreatic cyst. The arrows indicate four drains connecting the cyst to the stomach and duodenum, and the outline of the cyst is marked out.

This high efficacy is due to the very wide (up to 10 cm) opening of the cyst and anastomosis to the digestive tract. With the development of ultrasound techniques, cyst puncture under ultrasound monitoring started to be performed. The procedure, performed under local anesthesia, was performed very often; however, it turned out that its efficacy in terms of permanent closure of a cyst was low and did not exceed 4%-10%. A downside of this procedure was frequent infections of the cyst contents in up to 40% of biopsies performed (4). To avoid multiple punctures of the cyst and reduce the risk of infection, it was decided that cyst obliteration be performed. The efficacy of this method was high, but at the same time, there were many complications associated with administration of the obliterating agent, including cyst wall necrosis and peritonitis. With the development of endoscopic techniques and new implantable materials, the surgeons started to perform drainage of pancreatic cysts connecting to the Wirsung's duct during endoscopic retrograde cholangiopancreatography (ECPW) (6,7). A development of this technique is the currently performed cyst marsupialization to the gastrointestinal tract and fixation of the anastomosis site using a pig tail drain (8-10). The procedure is rapid and safe, and the use of endoscopic ultrasound helps to select a safe site for the anastomosis. However, the small diameter of the connection often causes obstruction of the anastomosis and a high incidence of recurrences (10% to 45%) (11-13). In our material, it was 14.5%. To reduce the number of cyst relapses, it was decided that concomitantly multiple-channel anastomosis to the digestive tract be performed. For this purpose, the cyst was connected to the stomach or duodenum using at least three drains. These connections were particularly applicable to multi-chambered cysts, because every pocket of the cyst could be effectively drained (Figure 1).

In conclusion multi-channel endoscopic anastomosis of pancreatic cyst to the gastrointestinal tract is a very effective method for drainage of large postinflammatory pancreatic cysts, comparable in terms of effectiveness with the surgical method but less invasive.

Ethics Committee Approval: Ethics committee approval was received for this study.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

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REFERENCES

1. Rogers BH, Cicurel NJ, Seed RW. Transgastric needle aspiration of pancreatic pseudocyst through an endoscope. Gastrointest Endosc 1975; 21: 133-4. [CrossRef]
2. Hershfield NB. Drainage of a pancreatic pseudocyst at ERCP. Gastrointest Endosc 1984; 30: 269-70. [CrossRef]
3. Kozarek RA, Brayko CM, Harlan J, et al. Endoscopic drainage of pancreatic pseudocysts. Gastrointest Endosc 1985; 31: 322-8. [CrossRef]
4. Adkisson KW, Baron TH, Morgan DE. Pancreatic fluid collections: diagnosis and endoscopic management, Semin Gastrointest Dis 1998; 9: 61-72.
5. Hariri M, Slivka A, Carr-Locke DL, Banks PA. Pseudocyst drainage predisposes to infection when pancreatic necrosis is unrecognized. AM J Gastroenterol 1781; 89: 1781-4.
6. Kozarek RA. Endotherapy for organized pancreatic necrosis: perspectives on skunk-poking. Gastroenterology 1996; 111: 820-2. [CrossRef]
7. Libera ED, Siqueira ES, Morais M, et al. Pancreatic pseudocysts: transpapillary and transmural drainage. HPB Surg 2000; 11: 333-8. [CrossRef]
8. Monkemuller KE, Baron TH, Morgan DE. Transmural drainage of pancreatic fluid collections without electrocautery using the seldinger technique. Gastrointest Endosc 1998; 48: 195-200. [CrossRef]
9. Binmoeller KF, Seifert H, Walter A, et al. Transpapillary and transmural drainage of pancreatic pseudocysts. Gastrointest Endosc 1995; 42: 219-24. [CrossRef]
10. Norton ID, Clain JE, Wiersema MJ, DiMagno EP, Petersen BT, Gostout CJ. Utility of endoscopic ultrasonography in endoscopic drainage of pancreatic pseudocysts in selected patients. Mayo Clin Proc 2001; 76: 794-8. [CrossRef]
11. Etzkorn KP, DeGuzman LJ, Holderman WH, et al. Endoscopic drainage of pancreatic pseudocysts: patient selection and evalu-

ation of the outcome by endoscopic ultrasonography. Endoscopy 1995; 27: 329-33. [CrossRef]

12. Baron TH, Harewood GC, Morgan DE, Yates MR. Outcome differences after endoscopic drainage of pancreatic necrosis, acute pancreatic pseudocysts, and chronic pancreatic pseudocysts. Gastrointest Endosc 2002; 56: 7-17. [CrossRef]
13. Barton TH, Morgan DE. Endoscopic transgastric irrigation tube placement via PEG for debridement of organized pancreatic necrosis. Gastrointest Endosc 1999; 50: 574-7. [CrossRef]