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Persistent Pancreatic Fistula after Surgical Necrosectomy for Severe Pancreatitis

V. Calu[1], M. Duțu[2], R. Pârvulețu[1], A. Miron[1]

[1]Department of Surgery, "Elias" Emergency Hospital, Bucharest, Romania
[2]Anaesthesiology and Intensive Care, "Elias" Emergency Hospital, Bucharest, Romania

Rezumat

Fistula pancreatică persistentă postnecrozectomie pentru pancreatită acută severă

Pancreatita severă ajunsă în stadiul chirurgical se complică frecvent cu fistulă pancreatică externă. Această boală pare să aibe o evoluție diferită de fistula pancreatică postoperatorie din cauza inflamației şi condițiilor anatomice locale. Lucrarea prezintă un caz de fistulă pancreatică externă postnecrozectomie, la care tratamentul conservator a eşuat şi la care a fost necesară reintervenția tardivă, fistulojejunostomia, precum şi o revizie a literarturii pe acest subiect.

Cuvinte cheie: fistula pancreatică, pancreatita acută severă, necrosectomie

Abstract

Severe pancreatitis in surgical stage is often complicated with external pancreatic fistula. This disease seems to have a different outcome comparing to postoperative fistula due to inflammation and local anatomical conditions. The paper presents a case of external fistula following necrosectomy, where the conservative treatment failed and a late surgical procedure was required, fistulojejunostomy; also a review of the literature on this topic was done.

Key words: pancreatic fistula, acute severe pancreatitis, necrosectomy

Corresponding author: Valentin Calu, M.D., PhD, Senior Surgeon
"Elias" Emergency Hospital
Department of Surgery
17 Mărăşti Blvd, Sector 1, Bucharest, Romania
Fax: +402131616102
E-mail: drcalu@yahoo.com

Introduction

Acute severe pancreatitis is a condition that requires in some specific situations a surgical procedure – necrosectomy – a complete removal of the pancreatic tissue necrosis. Sometimes this act leads to a disruption of the pancreatic duct and to an onset of an external pancreatic fistula. The outcome of the pancreatic fistula was more studied in the postoperative situations. Since a small number of cases with acute severe pancreatitis undergo surgery, the postnecrosectomy fistula is a quite rare situation compared to the incidence of pancreatitis and is less prone to heal spontaneously due to the inflammation and the obstruction of the main pancreatic duct. We present a case with postnecrosectomy pancreatic fistula which failed the conservative treatment and was submitted very late to a successful surgery.

Case report

We present a case of a male pacient, overweight, BMI 28, smoker and with a history of mild alcohol intake. On the 14th of June, 2010, he was admitted in another unit with the diagnosis of acute peritonitis secondary to anterior duodenal perforated ulcer and underwent an emergent operation – simple closure of the perforation and omental patch repair. The

surgical report described the pancreas enlarged and edematous. On the 29th of July, 2010, he experienced abdominal pain and referred to CT scan which revealed an enlarged pancreas with multiple fluid collections surrounding the pancreas (no images were available).

On the 2nd of August, 2010, he was transferred to our unit with the diagnosis of acute severe pancreatitis, confirmed by CT scan, and admitted to ICU. Conservative treatment was initiated, but after 48 hours clinical examination revealed peritoneal irritation syndrome. Measurements of abdominal pressure revealed 26 mmHg and compartment abdominal syndrome was diagnosed, with respiratory disfunction and arythmia. Lab test showed leucocytosis of WBC = 45000/ml. Emergent laparotomy was performed. Intraoperatively we found multiple adhesions, and a large volume of intraabdominal fluid was evacuated and sampled for bacteriology. The pancreas was enlarged and, after entering bursa omentalis, we found a large pancreatic necrosis. A difficult necrosectomy was performed, we were able to remove about 50% of the pancreas, all fluid collections were evacuated, an extensive adhesiolysis was necessary. Multiple drainage tubes were inserted, two of them remaining in the pancreatic lodge. After the operation the patient was retransferred to ICU, were the intensive treatment was continued – epidural analgesia, fluid resuscitation, total parenteral nutrition followed by enteral nutrition (the jejunal feeding tube being endoscopically inserted), antibiotics and antifungics (from the fluid collections Candida albicans was isolated, and from the necrosis, Acinetobacter spp), PPI's, Octreotide t.t.d.

The postoperative outcome was slow, but good, the patient resumes oral feeding, well tolerated. The CT scan evaluation on 31st of August, 2010, 27th postoperative day, showed small peripancreatic fluid collections, a well-positioned drainage tube and a small pseudocyst of the tail of the pancreas (Fig. 1).

But the drainage output from the pancreatic lodge was high at the beginning, amylase rich, and slowly decreased to a value of 350 ml/day on the 3rd of September, 2010, 30th postoperative day, when the patient was discharged, with only one drainage tube in place, and with strong recommendations of diet and treatment with Octreotide, PPI and Kreon.

After three months, on the 19th of November, 2010, the patient was reevaluated in our unit. He was in good health, tolerating oral diet, with a fistula output of 150 ml/day. The CT scan showed (Fig. 2) no peripancreatic fluid collections, no pseudcyst and a well-positioned drainage tube.

The patient's condition improved, he remained on oral diet, in a very good status. He was on Octreotide, PPI's and Kreon. The fistula output decreased constantly to a value of 50 ml/day. Several bacteriological examinations proved that the fluid was not infected. As a side effect of a long term Octreotide treatment gallbladder stones occurred. The patient, as anyone can imagine, was not very willing to undergo surgery and we still hoped for a spontaneous closure, so a year passed from the first procedure.

On the 22nd of June, 2011, travelling abroad, the patient experienced abdominal pain and he was admitted in another unit, where imagistic examination (CT, MRCP, fistulography) showed disconnected duct syndrome and a dilatation of the main duct in the body and tail of the pancreas (Fig. 3, 4, 5).

An ERCP was performed, which showed normal papilla and disconnected main pancreatic duct, and an attempt to put a stent was made, but unsuccessful. Another drainage tube was inserted, the previous one being obstructed, and the



Figure 1. *CT scan - – 31.08.2010*

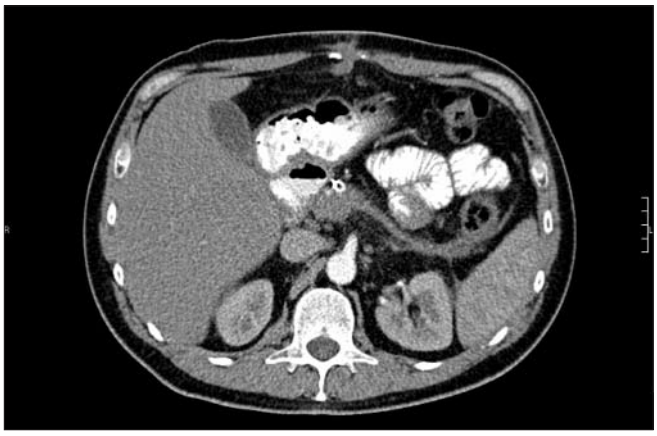


Figure 2. *CT scan - 19.11.2010*



Figure 3. *CT scan - 22.06.2011*

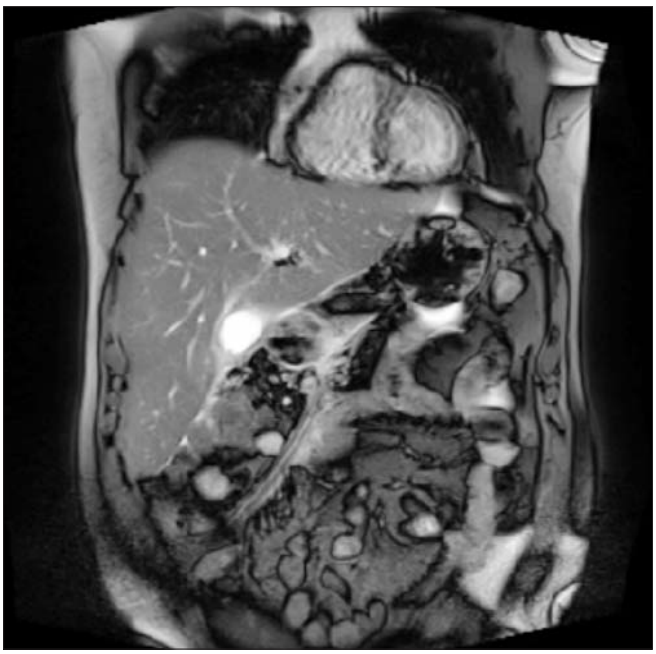


Figure 4. *MRCP - 22.06.2011*



Figure 5. *Fistulography - 23.06.2011*

patient was discharged on his own demand.

On the 29th of August, 2011, he was readmitted in our unit with the diagnosis of external pancreatic fistula, gallbladder stones and incisional hernia and operated two days later, when adhesiolysis, cholecystectomy with intraoperative cholangiogram, fistulojejunostomy (Roux-en-Y fistulojejunostomy in an end-to-side fashion) and cure of the incisional hernia (dual-mesh prosthesis) was performed. The fistulous tract, well formed, was dissected starting from the skin into the abdomen and a large part of it was resected, leaving just a small part of 2 cm below the root of the mesocolon, enough to perform the fistulojejunostomy, end-to-side fashion with a single layer of resorbable interrupted sutures. The postoperative outcome was uneventful and the patient was discharged eight days later. He is in good condition at the moment, symptom free and with no sign of relapse or pseudocyst formation until today.

Discussions

Acute necrotizing pancreatitis is a severe disease that requires in selected cases percutaneous drainage of peripancreatic fluid collections or surgical procedure for the debridement of necrosis, necrosectomy. The pancreatic duct is affected by necrosis in numerous cases, the pseudocysts can communicate with it, or the surgical procedure for debridement can disrupt it. Using ERCP or MRCP, a classification of the main pancreatic duct into three types was made: type I (normal), type II (strictured), type III (disconnected). In one of the largest series published, of 197 patients, studied between 1993 – 2010, Beck et al reported 71 late operations – 59 drainage procedures versus 12 resections. Duct type correlated with pancreatic debridement, persistent fluid collection or fistula, pain, p.o. intake intolerance and late operation (1).

Howard et al. have classified external pancreatic fistulas anatomically into end and side fistulas with side fistulas being additionally classified as postoperative and inflammatory. End external pancreatic fistulas are leaks from the pancreatic duct which have no continuity with the gastrointestinal tract. The most common anatomic configuration in these is the so-called "disconnected duct syndrome" due to necrosis of the mid pancreatic body along with the ductal epithelium, with no communication between the external pancreatic fistula and the proximal pancreatic duct. The distal remnant of the pancreas is an isolated pancreatic segment draining only into the fistula, so these are end fistulas which require internal drainage or resection in order to close. (2)

External pancreatic fistula following necrosectomy is a quite frequent consequence of this type of operation. An increasing incidence has been reported since the percutaneous drainage procedures gained an important role in the management of fluid collections and abdominal compartment syndrome (3). The reported incidence varies from 13 to 56%, with a spontaneous closure rate from 58 to 73,3% (4,5,6,7). In large series of 201 patients, between 1989 – 2002, Sadiq et al (8) encountered external pancreatic fistula in 20% of cases, with a spontaneous closure rate of 38% after 109±26 (median 70) days. They stratified the group considering the fistula output in: low (<200 ml/day) – 67%, moderate (200-500 ml/day) – 26%, and high (>500 ml/day) – 7%. 5 patients were referred to surgery after the failure of the conservative treatment. 24% of the patients with spontaneous closure of the fistula developed a pseudocyst after a mean of 123 days, most of them requiring a surgical drainage of the cyst. Univariate analysis of various factors (etiology, imaging findings prior to intervention, fistula characteristics and management) failed to identify any factors that could predict

early closure of fistula.

The criteria for the diagnosis of disconnected duct syndrome include: endoscopic retrograde cholangiopancreatography (ERCP) evidence of main pancreatic duct cut-off or discontinuity with the inability of accessing or cannulating the upstream pancreatic duct; computed tomography evidence of viable pancreatic tissue upstream from the pancreatic duct cut-off or discontinuity and a non-healing pancreatic fistula, pseudocyst or fluid collection despite a course of conservative medical management (9). There are other papers suggesting that other criteria should be used, such as: necrosis of at least 2 cm of the pancreas, viable pancreatic tissue upstream from the site of the necrosis and extravasation of contrast material injected into the main pancreatic duct at pancreatography (10). Secretin enhanced MRCP was proposed as an alternative to ERCP, but with lower sensitivity (11). Anyway, a preoperative evaluation of ductal anatomy and inflammation is mandatory prior to surgery and it usually requires ERCP and CT scan or MRI. It seems that is possible to predict disconnected duct syndrome in the early stage of acute pancreatitis (at the time of necrosis), using CT scan, when a large intrapancreatic collection or necrosis of a section of the pancreatic head, neck or body, combined with a viable segment of the distal body or tail occurs, with the duct in the pancreatic tail segment entering the collection at an angle of approximately 90 degrees (10).

There are severe potential complications after external pancreatic fistula: abscess formation with sepsis or bleeding from the fistulous tract (especially in high volume fistulas), with a mortality rate from 13 to 36% (8,12,13).

The management of external pancreatic fistula comprises various procedures that can be classified in nonsurgical (somatostatin and analogues, endoscopic transpapillary stenting - ERCP, fibrin glue, cyanoacrilate injection) associated with prolonged drainage, and surgical (fistulojejunostomy, pancreaticojejunostomy, pancreatic resection). The spontaneous closure rate is relatively high, 70 – 90% of cases can be managed non-operatively, but the drainage tube should not be removed as long as there is any significant drainage (14). The use of somatostatin and analogues in these cases is still under debate. In 2001, the analysis of 14 randomized controlled trials reached a major disagreement on whether the use of these drugs is of value in preventing postoperative complications (15). Another study from 2004 stated that pharmacotherapy with somatostatin reduces costs involved in fistula management, by reducing hospitalization, and also offers increased spontaneous closure rate (16). Octreotide may be used to reduce fistula output (level 2), but should be discontinued if no evident reduction in fistula output occurs in 5 – 8 days (level 3). In our case, the use of octreotide had a significant effect, transforming a high output into a low output fistula, and gave time for the resolution of the inflammatory process, but induced gall bladder stone development, as a side effect.

Endoscopic transpapillary stenting is considered helpful in the management of external pancreatic fistulas, where favorable anatomy is present, side fistulas (tail leak or a disruption within the head that can be traversed by the stent), and not helpful in complete ductal disruption, "dislocated" or "disconnected" duct syndrome (2,17). In our case ERCP failed because it was a disconnected duct, but was helpful in establishing the diagnosis, delineating the anatomy and was decisive in taking the decision for surgery. But endoscopic pancreatic drainage, when feasible, is safe and effective and should be considered as a first line therapy when external pancreatic fistulas do not respond to conservative therapy (12) and there is hope that, in the future, randomized controlled trials will report results that warrant the efficacy of early endoscopic intervention for fistula as the first choice of treatment (18).

Fistulous tract injections are mentioned in the literature only as case reports, different substances being used, as fibrin glue, cyanoacrilate or iodine (19,20,21,22).

Surgery becomes an option when nonsurgical treatment fails. There are predictive factors for failure, such as: low serum albumin, low serum sodium, high fluid-to-serum total protein ratio, co-existence of severe chronic pancreatitis at ERCP (disruption, stenosis, narrowing of the pancreatic duct) (12). Dislocated duct syndrome is a frequent and distinct entity that occurs after necrotizing pancreatitis and, cumulated with the inflammatory disease, has a low spontaneous closure rate. It usually requires surgery, the debate is between pancreatic resections and anastomoses – diversion of the pancreatic secretions into a Roux-type diversion of small bowel. Drainage procedures are favored over resection because they preserve pancreatic parenchyma and exocrine and endocrine function, but, while effective in the short-term, long-term patency of these anastomoses remains unknown (7). It seems that anastomoses are preferred by most surgeons (7,9,25), since the operating time is shorter, with less blood loss and transfusional requirements, with better clinical outcome (similar fistula recurrence rate, reoperation rate and death rate, and higher incidence of diabetes, pancreatic fistula and intra-abdominal abscess in the resected group) (9). The main question is how long we can wait until surgery and what type of anastomoses one should perform – fistulojejunostomy or pancreaticojejunostomy. The waiting time between drainage placement and surgery encountered in the literature is between 4 – 6 weeks, to 3, and even 6 months (2,7, 23,24). Some authors are advocating fistulojejunostomy as an effective therapy for the definitve treatment of pancreatic fistulas (24,25), and it is easier, while others (7,26) are in favor of pancreaticojejunostomy, even it is more difficult. The reason is that pancreaticojejunostomy is a durable drainge procedure comparing to fistulojejunostomy, which has a high recurrence rate at long term follow-up, the persistence of diabetes mellitus being an indicator of a poorly drained pancreatic remnant following fistulojejunostomy. The recurrence rate after fistulojejunostomy is about 35% and it is manifested by a pseudocyst formation that is resolved through another operation, usually a very difficult pancreatic resection (7).

In our case a fistulojejunostomy was performed, any attempt to see the pancreatic remnant was unsuccessful due to inflammation and adhesions and we agree that a fistulojejunostomy is easy, fast, without any potential risk of damaging any important structures surrounding the pancreas, encompassed in a fibrotic tissue after the inflammatory process.

Conclusions

Late necrosectomy is the best approach for patients with acute severe pancreatitis who develop in their outcome an infected necrosis (27,28). A persistent fistula following necrosectomy for necrotizing pancreatitis should be an indicator for a disconnected duct syndrome, an end inflammatory fistula, which is unlikely to close spontaneously. Recognizing this lesion is very important, and extensive imaging examination (ERCP, CT, MRCP) should be performed. Endoscopic pancreatic stenting should be attempted as a first-line of treatment, it can be effective in partial ductal lesions or persistent fluid collection or can allow the delay of surgery until the inflammation disappears (29,30). These patients are candidates for surgery, with high success rate, since complete rupture of main pancreatic duct usually fails endoscopic stenting (31). The surgeon can choose between resection and internal drainage procedures, the latter being preferred by the majority of surgeons. Fistulojejunostomy is safe and effective, simple, fast, but the patient should be kept under surveillance since it has higher recurrence rate comparing to pancreaticojejunostomy.

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