

## CASE REPORT

---

# Endoscopic Resolution of Pseudocyst Infection and Necrosis as a Complication of Endoscopic Pseudocyst Drainage. A Case Report

Rodrigo Azevedo Rodrigues, Lucianna Pereira da Motta Pires Correia,  
Maria Rachel da Silveira Rohr, Frank Shigueo Nakao, Marcus Melo Martins dos Santos,  
Angelo Paulo Ferrari, Ermelindo Della Libera

Division of Gastroenterology, Federal University of São Paulo. São Paulo, Brazil

### ABSTRACT

**Context** Endoscopic therapy has recently gained importance as an option for the treatment of pancreatic necrosis. We report a case of transgastric endoscopic resolution of pseudocyst infection and necrosis as a complication of endoscopic pseudocyst drainage.

**Case report** The patient underwent several sessions of endoscopic removal of debris and necrotic material, intercalated with daily lavage and aspiration through a nasocystic tube.

**Conclusions** At the present time, fourteen months after pancreatic pseudocyst secondary infection, the patient remains asymptomatic with no radiographic signs of pseudocyst recurrence. Transmural endoscopic therapy followed by continuous drainage and necrosectomy is a reasonable option for treating the pancreatic pseudocyst secondary infection.

---

### INTRODUCTION

Symptomatic pancreatic pseudocysts typically present with abdominal pain, a palpable epigastric mass and, occasionally, with jaundice or gastric outlet obstruction. Evidence of pancreatitis, a diameter greater than 6 cm, multiplicity of pseudocysts and

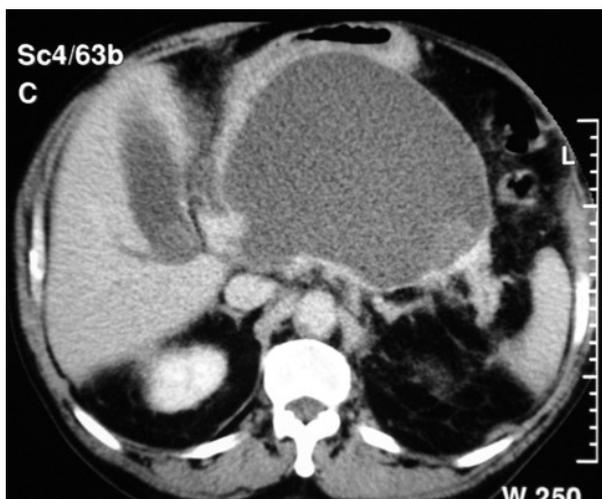
thickening of the pseudocyst wall are associated with a persistent course, which occurs in up to 50% of cases, requiring therapy [1]. Although surgery has been considered the treatment of choice for this complication, endoscopic therapy alone achieves good results in more than two-thirds of patients [2, 3, 4, 5, 6, 7]. Endoscopic drainage can be performed through the gastric or duodenal walls (transmural) or via the pancreatic duct (transpapillary) [7, 8, 9]. Initially described for the treatment of simple peripancreatic collections, the endoscopic approach has recently gained importance as an option for the treatment of pancreatic necrosis [10, 11]. We report a case of transgastric endoscopic resolution of pseudocyst infection and necrosis as a complication of endoscopic pseudocyst drainage.

### CASE REPORT

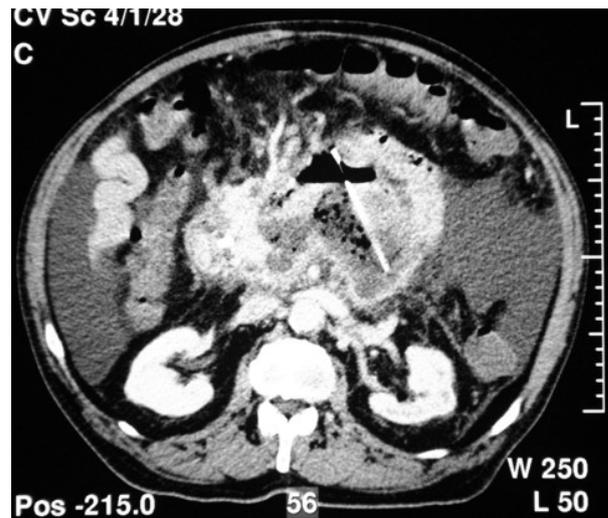
A 69-year-old man presented with a history of upper abdominal pain and jaundice of 1-month duration. The patient had a history of elevated alcohol intake with a previous diagnosis of chronic pancreatitis and liver disease. Physical examination revealed several stigmata of cirrhosis, a few ascites and a well-defined abdominal mass of 10 cm or more with a cystic consistency. One year before admission, the patient presented with acute pancreatitis complicated by an

asymptomatic pseudocyst with no criteria for drainage.

Initial laboratory evaluation showed the following values: hemoglobin 8.6 g/dL (reference range: 12.5-16.0 g/dL); hematocrit 26.8% (reference range: 39-45%); white blood cells  $7.6 \times 10^3/\mu\text{L}$  (reference range:  $1.5-7.5 \times 10^3/\mu\text{L}$ ); neutrophils 62% (reference range: 40-75%) and lymphocyte 21% (reference range: 20-50%); platelet  $281 \times 10^3/\mu\text{L}$  (reference range:  $120-400 \times 10^3/\mu\text{L}$ ); random plasma glucose 207 mg/dL (reference range: 80-110 mg/dL); creatinine 1.4 mg/dL (reference range: 0.3-1.2 mg/dL); calcium 8.0 mmol/dL (reference range: 7.5-9.0 mmol/dL); albumin 3.6 g/dL (reference range: 3.0-5.5 g/dL); serum AST 242 IU/L (reference range: 0-38 IU/L); serum ALT 318 IU/L (reference range: 0-38 IU/L); total bilirubin 3.2 mg/dL (reference range: 0.2-1.0 mg/dL); direct bilirubin 2.3 mg/dL (reference range: 0.1-0.4 mg/dL); amylase 42 IU/L (reference range: 0-160 IU/L) and lipase 180 IU/L (reference range: 0-160 IU/L). The ascitic fluid was turbid-yellow with a total cell count of  $295/\mu\text{L}$  (40% lymphocyte), amylase 7.0 IU/L, albumin 0.6 g/dL, total protein 1.4 g/dL and negative for malignant cells. A chest radiography was unremarkable. A CT scan revealed an 18 cm thin-walled low-attenuation cystic mass at the pancreatic



**Figure 1.** Computerized tomography of the abdomen revealed an intra-abdominal pseudocyst (18 cm) associated with compression of the posterior gastric wall.

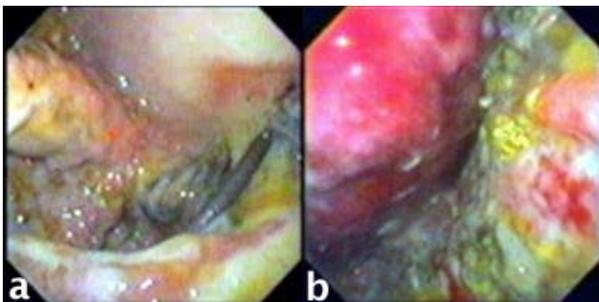


**Figure 2.** Twenty-five days after pseudocyst drainage, computerized tomography showed reduction of the cyst size with air, heterogeneous material and migration of the plastic stent into the cystic cavity.

region associated with compression of the posterior gastric wall (Figure 1). There was no biliary tract dilation. Esophagogastroduodenoscopy showed three medium size esophageal varices with no red-spots and an extrinsic compression at the posterior gastric wall. Endoscopic ultrasound confirmed gastric compression and showed no major vascular interposition. ERCP was performed and revealed a distal benign biliary stenosis easily trespassed with a plastic 10 Fr stent. Brush cytology was unremarkable. Pancreatography was not feasible at that time. Endoscopic transgastric pseudocyst drainage was planned. After prophylactic antibiotic therapy, the posterior gastric wall was punctured with a needle-knife catheter. Balloon dilation of the puncture site was performed. A large amount of brownish fluid with no debris spurting out of the cyst and three plastic straight stents (two of 10 Fr and one of 7 Fr) were placed at the gastrocystic window. The amylase level of the cystic fluid was 3,950 IU/L. The patient was discharged and placed on antibiotic therapy after prompt remission of jaundice and pain. He was asymptomatic one week later.

Twenty-five days after pseudocyst drainage, the patient was readmitted with fever and abdominal pain. A blood sample analysis showed evidence of acute infection with no

signs of cholangitis: white blood cells  $5.6 \times 10^3/\mu\text{L}$ ; 47% segmented neutrophils; 6% band forms; 1% myelocytes; creatinine 0.9 mg/dL; albumin 2.2 g/dL; serum AST 29 IU/L; serum ALT 14 IU/L; total bilirubin 1.3 mg/dL; direct bilirubin 0.8 mg/dL; amylase 23 IU/L. The ascitic fluid, as well as, chest radiography, urine sample and cultures were unremarkable, indicating that the pseudocyst was the source of infection. A new CT scan revealed reduction of the cyst size (8x5 cm) with air, heterogeneous material and two plastic stents which had migrated into the cystic cavity (Figure 2). Esophagogastro-duodenoscopy showed a narrowed gastro-cystic window with one occluded stent which was removed. Balloon dilation (12 mm) of the cystogastrostomy was performed. A large amount of necrosis and pus, and the migrated stents were seen endoscopically. The stents were removed with a regular foreign-body forceps and abundant lavage with saline solution and suction was performed through the gastroscope (Figure 3). Solid material was gently removed with a polypectomy snare. A nasocystic tube was placed into the cavity for further lavage and aspiration. The patient underwent four other similar procedures in a 3-day interval basis intercalated with a daily 1,000 to 2,000 mL lavage and aspiration through the nasocystic tube. Antibiotics were given. After the fifth endoscopic necrosectomy, a CT scan showed a smaller cystic lesion 5 cm in diameter and no solid material in the cavity. Fourteen days after the first necrosectomy, the nasocystic tube was removed and three pigtail transgastric stents



**Figure 3.** Endoscopic aspect of the cystic cavity. **a.** Necrosis, purulent collection, and migrated stent. **b.** After aspiration and the repeated removal of solid material.

were placed. The patient presented no signs of infection and the leucocyte count was normal. The patient was discharged and was followed up as an outpatient. Another ERCP was performed one week later. The biliary stent was replaced and a second brush cytology was negative for malignancy. At this time, a pancreatography was carried out showing complete disruption of the distal pancreatic duct with no identification of its proximal segment. Only two months after the first necrosectomy, a CT scan showed no collection on the pancreatic topography. The pigtail and biliary stents were removed. At the present time, fourteen months after pancreatic pseudocyst secondary infection, the patient remains asymptomatic with no radiographic signs of pseudocyst recurrence.

## DISCUSSION

Endoscopic therapy has played an increasing role in the treatment of pancreatic pseudocysts since it was first reported two decades ago [6]. Surgical therapy is associated with high rates of morbidity (15%) and a mortality rate of up to 5%. Percutaneous drainage is considered a temporary option because of its high rate of recurrence (up to 70%), morbidity (up to 30%) and mortality (up to 10%) [5]. Although less invasive than other strategies, endoscopic therapy is not free of complications. Bleeding at the puncture site is usually mild but controlled during the endoscopic procedure and rarely requires surgical intervention [5, 12]. Perforation of the peritoneal cavity is uncommon and usually responds well to conservative treatment [5]. This complication tends to be less frequent with the ready availability of EUS in most referral centers. EUS inspection of the puncture site rules out the presence of underlying major vessels. It is now considered the standard of care for endoscopic pancreatic pseudocyst decompression [8, 13]. Pseudocyst infection is the most common complication [13] and may be associated with stent migration or clogging. In these cases, patients are usually referred to surgery unless they are unfit for a surgical procedure. Although most authors recommend double

pigtail stents to be used for transmural drainage [10, 13, 14], some series of pancreatic pseudocyst drainage have shown low rates of straight stent migration [5, 12]. Until now, no comparative study has been published as to whether straight or pigtail stents should be used for this purpose. A pancreatography is advisable when pancreatic pseudocyst therapy is considered. If a disrupted duct is found, or when it cannot be 'bridged' by a stent, some authors believe that endoscopic therapy should be discouraged [15]. In this case, we were unable to access the pancreatic duct during the first ERCP. Endoscopic management of pancreatic pseudocysts includes technically demanding procedures and experienced hands [16]. Anyone who considers carrying out this procedure must be able to manage eventual complications. In the present case, the migration of two straight stents and the clogging of one transgastric stent were probably the leading cause of pancreatic pseudocyst infection and necrosis since the patient had not had a recent episode of acute pancreatitis. Transmural endoscopic therapy followed by continuous drainage and necrosectomy was a reasonable option to treat this complication since this patient was not a good candidate for surgery. Endoscopic necrosectomy is gaining acceptance in the treatment of primary organized pancreatic necrosis [10, 16] and should also be considered as an initial approach for the resolution of secondary infection.

---

Received January 30<sup>th</sup>, 2008 - Accepted April, 24<sup>th</sup>, 2008

**Keywords** Debridement; Pancreatic Pseudocyst; Pancreatitis, Chronic

**Conflict of interest** All authors confirm that there are no potential conflicts of interest.

**Correspondence**

Rodrigo Azevedo Rodrigues  
Rua Gomes de Carvalho, 100 casa 07  
Vila Olímpia  
São Paulo, SP  
CEP 045 47 001

Brazil

Phone: +55-11.3849.9733

Fax: +55-11.5576.4050

E-mail: rodrigo.ar@terra.com.br

Document URL: <http://www.joplink.net/prev/200807/11.html>

---

**References**

1. Bradley EL, Clements JL Jr, Gonzalez AC. The natural history of pancreatic pseudocysts: a unified concept of management. *Am J Surg* 1979; 137:135-41. [PMID 758840]
2. Johnson LB, Rattner DW, Warshaw AL. The effect of size of giant pancreatic pseudocysts on the outcome of internal drainage procedures. *Surg Gynecol Obstet* 1991; 173:171-4. [PMID 1925874]
3. Laxson LC, Fromkes JJ, Cooperman M. Endoscopic retrograde cholangiopancreatography in the management of pancreatic pseudocysts. *Am J Surg* 1985; 150:683-6. [PMID 3907381]
4. Nealon WH, Townsend CM Jr, Thompson JC. Preoperative endoscopic retrograde cholangiopancreatography (ERCP) in patients with pancreatic pseudocyst associated with resolving acute and chronic pancreatitis. *Ann Surg* 1989; 209:532-8. [PMID 2705818]
5. Smits ME, Rauws EA, Tytgat GN, Huibregtse K. The efficacy of endoscopic treatment of pancreatic pseudocysts. *Gastrointest Endosc* 1995; 42:202-7. [PMID 7498683]
6. Kozarek RA, Brayko CM, Harlan J, Sanowski RA, Cintora I, Kovac A. Endoscopic drainage of pancreatic pseudocysts. *Gastrointest Endosc* 1985; 31:322-7. [PMID 4043685]
7. Binmoeller KF, Seifert H, Walter A, Soehendra N. Transpapillary and transmural drainage of pancreatic pseudocysts. *Gastrointest Endosc* 1995; 42:219-24. [PMID 7498686]
8. Antillon MR, Shah RJ, Stiegmann G, Chen YK. Single-step EUS-guided transmural drainage of simple and complicated pancreatic pseudocysts. *Gastrointest Endosc* 2006; 63:797-803. [PMID 16650541]
9. Cremer M, Deviere J, Engelholm L. Endoscopic management of cysts and pseudocysts in chronic pancreatitis: long-term follow-up after 7 years of experience. *Gastrointest Endosc* 1989; 35:1-9. [PMID 2920879]
10. Seewald S, Groth S, Omar S, Imazu H, Seitz U, de Weerth A, et al. Aggressive endoscopic therapy for pancreatic necrosis and pancreatic abscess: a new safe and effective treatment algorithm (videos). *Gastrointest Endosc* 2005; 62:92-100. [PMID 15990825]
11. Baron TH, Thaggard WG, Morgan DE, Stanley RJ. Endoscopic therapy for organized pancreatic

necrosis. *Gastroenterology* 1996; 111:755-64. [PMID 8780582]

12. Della Libera E, Siqueira ES, Morais M, Rohr MR, Brant CQ, Ardengh JC, Ferrari AP. Pancreatic pseudocysts transpapillary and transmural drainage. *HPB Surg* 2000; 11:333-8. [PMID 10674749]

13. Baillie J. Pancreatic pseudocysts (Part II). *Gastrointest Endosc* 2004; 60:105-13. [PMID 15229441]

14. Catalano MF, Geenen JE, Schmalz MJ, Johnson GK, Dean RS, Hogan WJ. Treatment of pancreatic

pseudocysts with ductal communication by transpapillary pancreatic duct endoprosthesis. *Gastrointest Endosc* 1995; 42:214-8. [PMID 7498685]

15. Parks RW, Tzovaras G, Diamond T, Rowlands BJ. Management of pancreatic pseudocysts. *Ann R Coll Surg Engl* 2000; 82:383-7. [PMID 11103153]

16. Kozarek RA. Endoscopic management of pancreatic necrosis: not for the uncommitted. *Gastrointest Endosc* 2005; 62:101-4. [PMID 15990826]