

## CASE REPORT

# Infected Pancreatic Pseudocyst Ruptured into Stomach and Colon Associated with Splenic Artery Pseudoaneurysm

Hiroshi Ohkawara<sup>1</sup>, Akiko Shichishima-Nakamura<sup>1</sup>, Kazuhiko Ikeda<sup>1,2</sup>, Masumi Sukegawa<sup>1</sup>, Miki Furukawa<sup>1</sup>, Takahiro Sano<sup>1</sup>, Koki Ueda<sup>1</sup>, Satoshi Kimura<sup>1</sup>, Akiomi Yoshihisa<sup>1</sup>, Hideyoshi Noji<sup>1</sup>, Kazuei Ogawa<sup>1</sup>, Yasuchika Takeishi<sup>1</sup>

<sup>1</sup>Department of Cardiology and Hematology, Fukushima Medical University, Fukushima, Japan

<sup>2</sup>Department of Blood Transfusion and Transplantation Immunology, Fukushima Medical University, Fukushima, Japan

### ABSTRACT

**Context** Pancreatic pseudocysts, which are known to be a common complication of chronic pancreatitis, occasionally result in spontaneous intestinal perforation. However, multiple perforations of pancreatic pseudocysts into internal organs are rarely seen. **Case report** A 46-year-old man was admitted to our hospital complaining of left upper abdominal pain, where a palpable mass was found. Abdominal computed tomography scan showed a large pancreatic pseudocyst in the tail of the pancreas and a splenic artery pseudoaneurysm. The pseudoaneurysm was treated by urgent percutaneous transarterial embolization. Endoscopic examinations revealed fistulas that had ruptured into the stomach and transverse colon. The patient had a high fever with prolonged elevated C-reactive protein. Contaminated fluid/debris was eliminated from the infected pseudocyst cavity under colonoscopy and ileostomy, followed by spontaneous closure of the fistulas. **Conclusion** This is a rare patient of a ruptured pancreatic pseudocyst in the stomach and colon, complicated by a splenic artery pseudoaneurysm.

### INTRODUCTION

Spontaneous ruptures occur in less than 5% of patients with pancreatic pseudocysts, and perforation of the pseudocyst into the surrounding visceral structure is rare [1, 2, 3]. The activation of pancreatic enzymes and the vulnerability of pseudocysts occasionally causes spontaneous perforation into other internal organs, and some patients of spontaneous perforations of the pseudocyst into surrounding organs have been reported [4, 5, 6, 7]. Splenic artery pseudoaneurysm, which occurs as a potentially serious complication of chronic pancreatitis, has also been rarely reported [8, 9, 10, 11, 12]. Herein, we present a rare patient of a large pancreatic pseudocyst communicated with the operative stomach and colon, and this patient was associated with a splenic artery pseudoaneurysm.

### CASE REPORT

A Forty-six-year-old man was admitted to our hospital with left upper abdominal pain, where he had found a palpable mass. On examination, a palpable mass was

found and he was revealed to develop severe hypotension (systolic blood pressure 64 millimeters of mercury). He had chronic alcohol-related pancreatitis and underwent subtotal gastrectomy for gastric ulcers 16 years previously. Abdominal computed tomography (CT) scan revealed a large pancreatic pseudocyst (12 cm in diameter; **Figure 1a**) in the tail of the pancreas, and a hemorrhagic splenic artery pseudoaneurysm (4 cm in diameter; **Figure 1b**). The CT scan also showed air and accumulation of fluid/debris in the pseudocyst cavity, indicating **gastrointestinal perforation** into the pseudocyst (**Figure 1a**). Peripheral blood examination showed leukocytosis and anemia, with a white blood cell count of  $14.5 \times 10^9/L$  and hemoglobin level of 65 g/L. Serum biochemical analysis showed low levels of amylase 18 IU/L (normal range: 25–125 IU/L), alkaline phosphatase 245 IU/L (normal range: 44–147 IU/L), and C-reactive protein 17 mg/L.

Transarterial embolization with stainless steel coils was performed to treat the ruptured pseudoaneurysm, and the large pseudocyst was subsequently reduced in size. Endoscopic examinations revealed fistulas, which ruptured into both the stomach and transverse colon (**Figures 2 a,b**). Endoscopic retrograde cholangiopancreatography did not reveal any communication between the main pancreatic duct and the pseudocyst (**Figure 2c**). The patient had a high fever with prolonged elevated C-reactive protein (12 mg/L), indicating an infected pancreatic pseudocyst. The colonoscope, which was similar in diameter to the colonic fistula, was inserted into the pseudocyst cavity through the colonic fistula into the operative stomach (**Figure**

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**Correspondence** Hiroshi Ohkawara  
Department of Cardiology and Hematology  
Fukushima Medical University  
1 Hikariga-oka, Fukushima, Fukushima, 960-1295, Japan  
**Phone** +81-24-547-1190  
**Fax** +81-24-548-1821  
**E-mail** ohkawara@fmu.ac.jp

2d), and a potential refractory infection aggravated by fecal contamination in the pseudocyst cavity was observed under colonoscopy (Figure 2b).

We eliminated the contaminated fluid/debris in the pseudocyst and cleaned the infected cavity with a saline solution. Subsequently, the size of the pseudocyst was reduced, and the serious infection in the cavity was improved. Retrograde barium intestinal study showed that the size of the pseudocyst was markedly reduced (Figure 2e). The patient underwent an ileostomy, after that the

fistulas closed spontaneously and the ileectomy reversed.

Finally, the patient maintained an asymptomatic state, and follow-up CT scans showed no sign of recurrence over a nine-year follow-up period (Figures 3ab).

### DISCUSSION

Pancreatic enzymes and cytokines activated by chronic pancreatitis induce pseudocyst formation, potentially resulting in spontaneous perforation into the surrounding hollow viscera [13, 14]. Endoscopic therapies such as

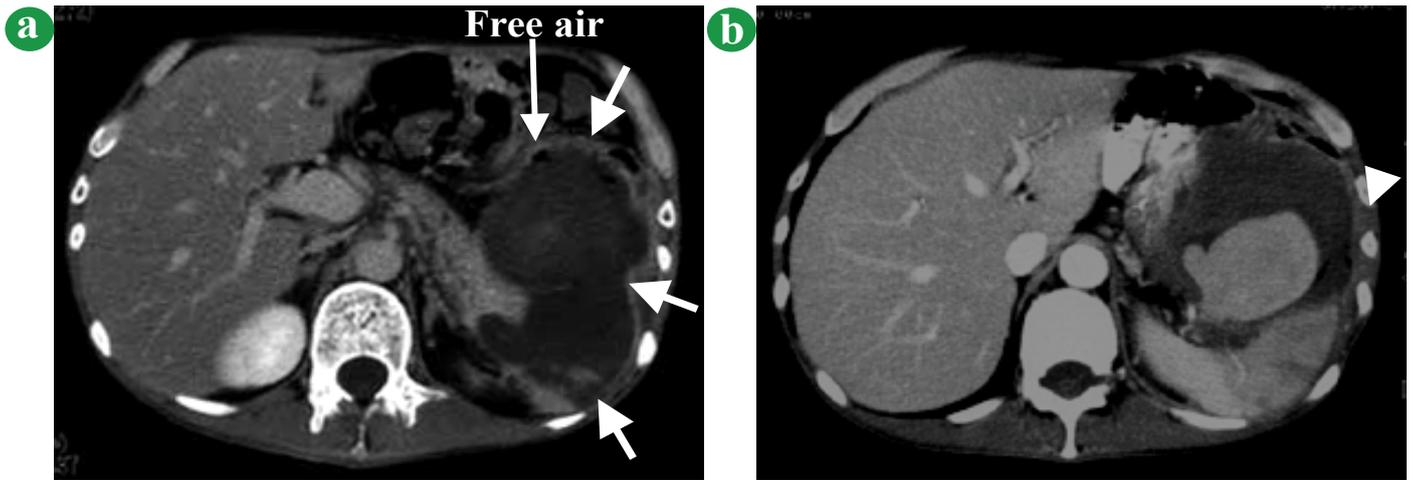


Figure 1. Findings of a contrast-enhanced computed tomography scan on admission. (a). The arrows indicates a giant pancreatic pseudocyst (10 cm in diameter), containing free air, in the tail of the pancreas. (b). The arrowhead indicates a hemorrhagic pseudoaneurysm (4 cm in diameter) of the splenic artery in the pseudocyst.

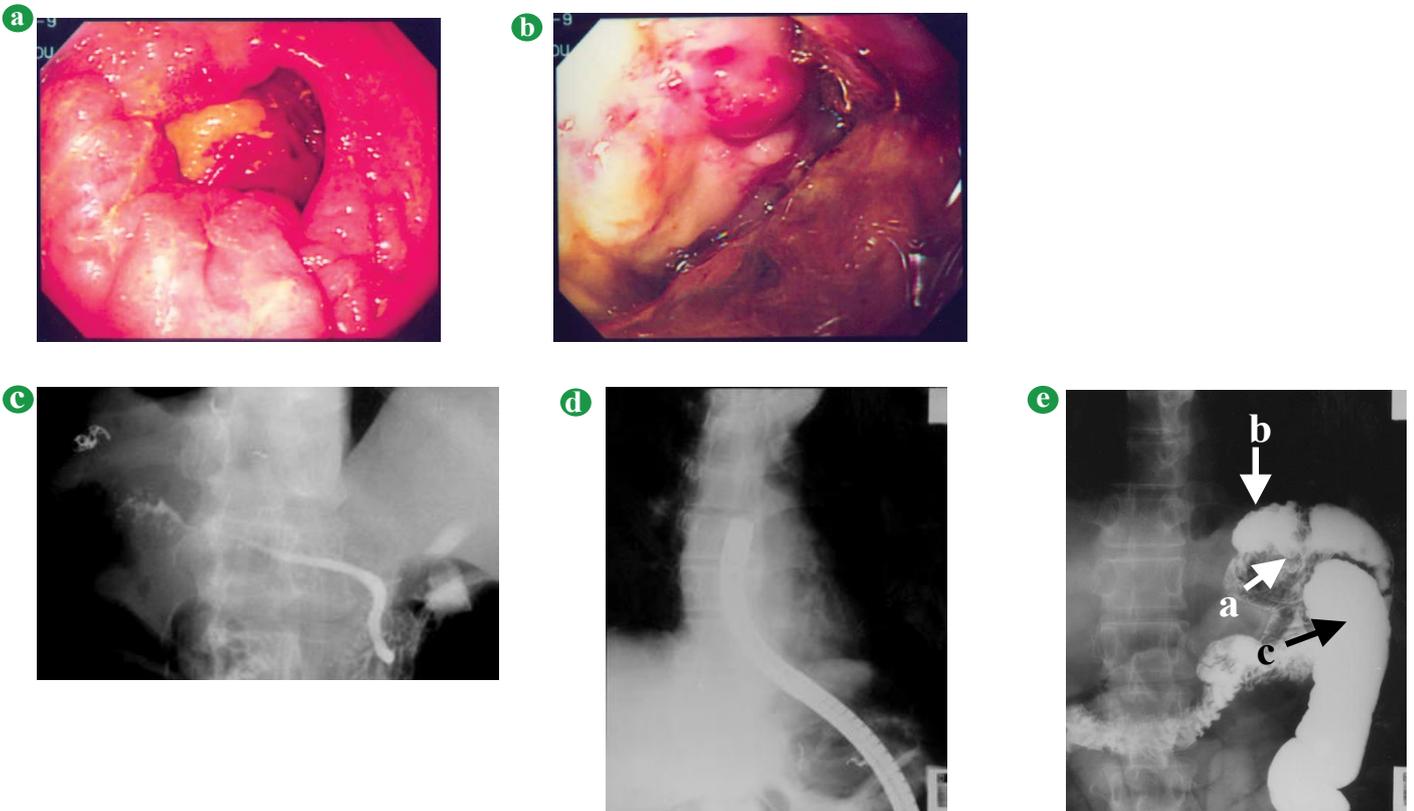
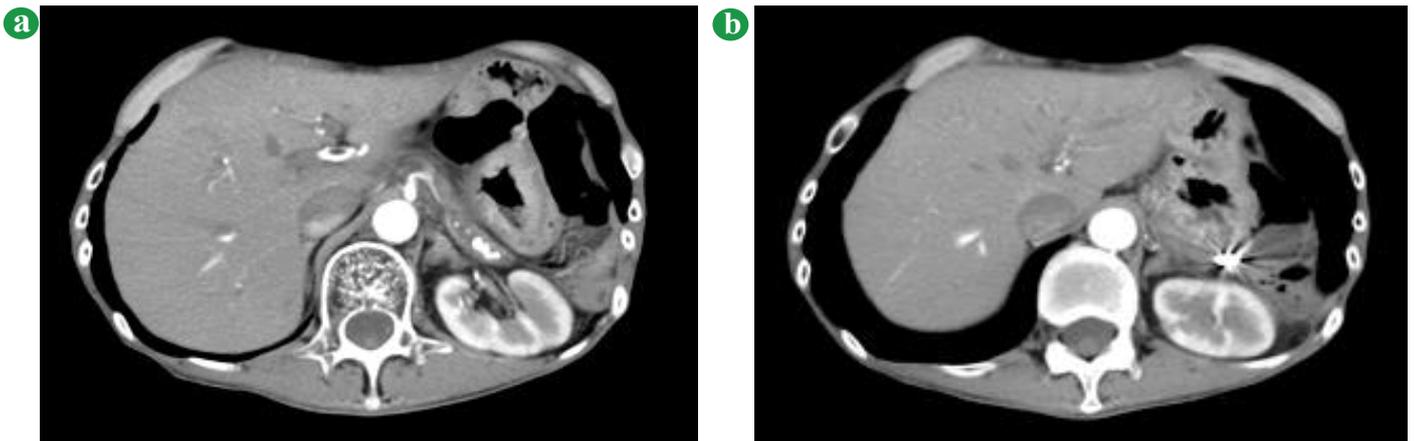


Figure 2. (a). Gastroscopic finding showing an aspect of a large fistula into the inside of the pancreatic pseudocyst in the greater curvature of the stomach. (b). Colonoscopic findings showing a fistula into the pancreatic pseudocyst at the splenic flexure of the transverse colon. (c). Endoscopic retrograde cholangiopancreatography showing that there is no communication between the main pancreatic duct and the pseudocyst. (d). Radiography showing a bougienage using the colonoscope through the fistula of the infected pancreatic pseudocyst and the colonoscope reaching the esophagus. (e). A retrograde barium intestinal study showing that the infected pseudocyst (arrow a) with the fistulas between the stomach (arrow b) and the colon (arrow c) was reduced in size.



**Figure 3. (ab).** Follow-up computed tomography scans showing no sign of recurrence in the tail of the pancreas over a nine-year follow-up period. The arrow indicates intravascular embolization coils.

transmural or transpapillary drainage and surgical procedures are useful for the treatment of pancreatic pseudocysts [15, 16, 17, 18]. Fistulization of pancreatic pseudocysts into surrounding viscera usually requires surgical treatment [17, 18, 19, 20]. It has been reported that an infected pancreatic pseudocyst with a colonic fistula can be treated successfully with a combination of endoscopic drainage and antibiotics [21]. Splenic artery pseudoaneurysm, which is a complication of chronic pancreatitis or trauma, is rarely seen and surgical or endovascular treatment of the pseudoaneurysm is usually required [9, 10, 11]. A pseudoaneurysm is caused either by enzymatic activation of peripancreatic arteries or erosion of a visceral artery by a pancreatic pseudocyst [14, 22].

To our knowledge, this is the first reported patient of a pancreatic pseudocyst fistulized into two hollow viscera associated with a splenic artery pseudoaneurysm. In this patient, enzymatic activation due to worsening pancreatitis and extrinsic compression of the enlarged pseudoaneurysm may potentially induce spontaneous perforations. Since fecal contamination can result in serious infection or hemorrhage, rupture of a pancreatic pseudocyst into the colon generally requires operative intervention [19, 20]. In this patient, the remaining fluid/debris in the pseudocyst indicated a refractory infection aggravated by fecal contamination, and the elimination of the contaminated fluid/debris under colonoscopy and ileostomy was effective for the treatment of the infected pseudocyst cavity.

In conclusion, we described a rare patient with a large pancreatic pseudocyst that ruptured into the stomach and colon, complicated by the hemorrhagic splenic artery pseudoaneurysm. The patient was recovered from severe bleeding resulting from the artery pseudoaneurysm with urgent transarterial embolization, and that the infected pseudocyst with fistulas closed spontaneously after an ileostomy.

### Conflict of Interest

The authors declare no conflict of interest.

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