

Case Report
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## Successful EUS-guided drainage of a pancreatic pseudocyst complicated by obstructive jaundice

Hiroyuki Miyatani, Yukio Yoshida, Shinya Ushimaru,  
Yasutaka Kudo, Hideaki Honda, Junko Murayama,  
Yukihiisa Sawada, Yoshiyuki Nakashima, Takuhiro Ugajin,  
Kaori Ochiai, Noriyoshi Sagihara, Ikuo Nakamura,

Obstructive jaundice caused solely by a pancreatic pseudocyst is rare. We report a case of a pancreatic pseudocyst complicated by obstructive jaundice successfully treated by EUS-guided drainage. A 48-year-old man was admitted to our hospital due to jaundice and abdominal distention. He had undergone necrosectomy of the pancreatic head for acute non-alcoholic pancreatitis about 1 year before the current admission. Following a diagnosis of obstructive jaundice due to compression by a pancreatic pseudocyst, EUS-guided drainage was performed with a 6F nasocystic catheter. Two weeks later, the pancreatic pseudocyst had decreased in size, and a 7F double pig-tail biliary stent was placed to drain the cavity. The patient responded well to treatment, and his laboratory values normalized. A follow-up CT scan 2 months later showed that the pancreatic pseudocyst had disappeared. The patient had an uncomplicated recovery and has been asymptomatic for 11 months. There have been no previous reports of successful drainage under EUS-guidance in cases of obstructive jaundice caused solely by a pancreatic pseudocyst without biliary drainage.

(Key words : pancreatic pseudocyst, obstructive jaundice, EUS-guided drainage)

### Introduction

Obstructive jaundice caused solely by a pancreatic pseudocyst is rare<sup>1,2</sup>. Most cases of obstructive jaundice associated with pseudocysts, in particular those due to chronic pancreatitis, appear to be due to fibrosis of the intrapancreatic portion of the common bile duct<sup>1,3,4</sup>. Simple drainage of the pseudocysts was not effective in these cases<sup>1</sup>. Successful simple EUS-guided drainage has not been reported in previous cases of obstructive jaundice associated with pseudocysts. We report a case of a pancreatic pseudocyst complicated by obstructive jaundice 1 year after necrosectomy for non-alcoholic acute pancreatitis that was successfully treated by EUS-guided drainage.

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\* First Department of General Medicine, Jichi Medical University, Omiya Medical Center,  
Correspondence to : Hiroyuki Miyatani First Department of General Medicine, Jichi Medical University,  
Omiya Medical Center,

### Case report

A 48-year-old man was admitted to our hospital due to jaundice and abdominal distention. He had undergone necrosectomy of the pancreatic head due to acute non-alcoholic pancreatitis about 1 year before the current admission. He was a social drinker and did not have gallstones or CBD stones. Cholangiography after the initial operation revealed no bile duct abnormalities. However, 10 months after necrosectomy, the patient gradually developed abdominal distention due to a pseudocyst of the pancreatic head. Abnormal liver function tests and obstructive jaundice were also noted. A CT scan revealed an 8 cm cystic lesion in the pancreatic head that was compressing the common bile duct (Fig. 1). On admission, he presented with a hard mass in the upper abdomen and epigastralgia, nausea, and vomiting. Laboratory data on the day before drainage included: white blood cell count, 6180/ $\mu$ l (normal range, 3900–9800); total bilirubin, 9.0 mg/dl (0.2–1.0); direct bilirubin, 7.1 mg/dl (0.1–0.5); alanine aminotransferase, 30 mU/ml (11–31); aspartate aminotransferase, 95 mU/ml (4–30); alkaline phosphatase, 1131 mU/ml (100–305);  $\gamma$ -glutamic transpeptidase, 323 mU/ml (<70); amylase, 596 mU/ml (40–130), C-reactive protein, 8.6 mg/dl (<0.2). A diagnosis of obstructive jaundice due to compression by a pancreatic pseudocyst was made, and EUS-guided drainage was performed. On endoscopy, the pseudocyst compressed the lower body of the gastric posterior wall. EUS showed a large, thick-walled pseudocyst; no vessels were located at the intended puncture site. We punctured the lower body of the gastric posterior wall using a needle knife catheter with electrocautery (Fig. 2). Immediately after puncture, a guide wire was advanced into the pseudocyst to maintain access. Next, a 6F pig-tail nasocystic drainage catheter was inserted into the pseudocyst without needing to dilate the puncture site with a balloon catheter (Fig. 3). Minor hemorrhage into the gastric lumen occurred, which stopped spontaneously. A CT scan done soon after drainage revealed no extravasation of fluid or blood. The amylase level of the aspirate was 25012 mU/ml. *E. coli* and *Streptococcus anginosus* were isolated from the aspirate. Two weeks later, the pancreatic pseudocyst had decreased in size, and a 7F double

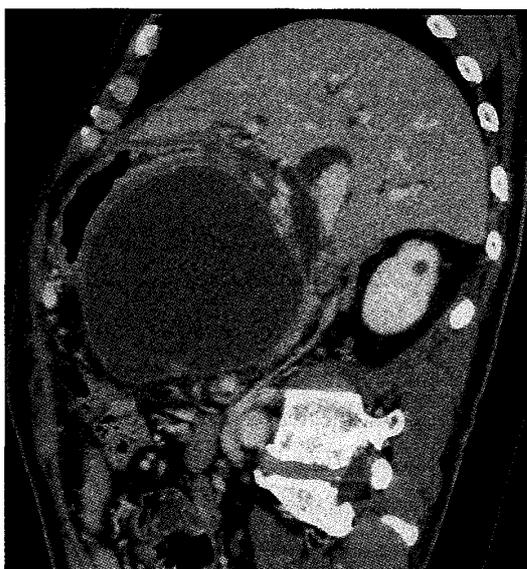


Figure 1 CT scan shows an 8 cm cystic lesion in the pancreatic head compressing the common bile duct.

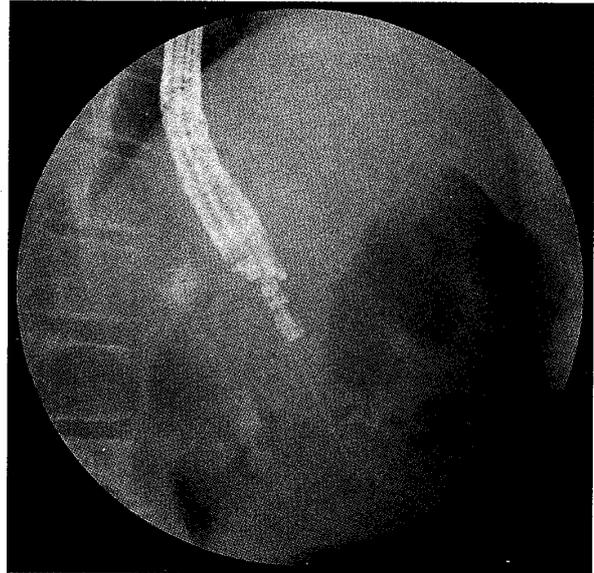
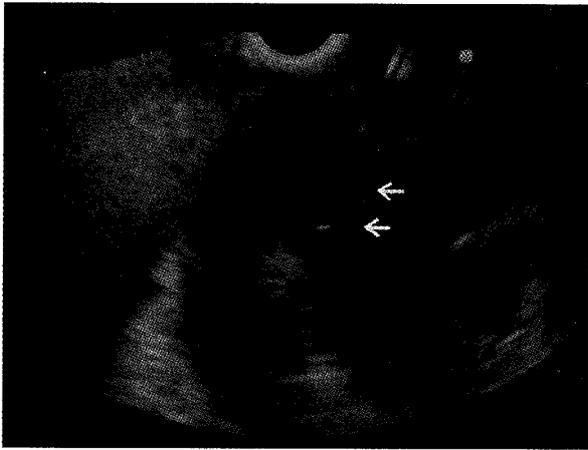


Figure 2 EUS and radiographic views demonstrate a needle knife inserted into the pancreatic pseudocyst.

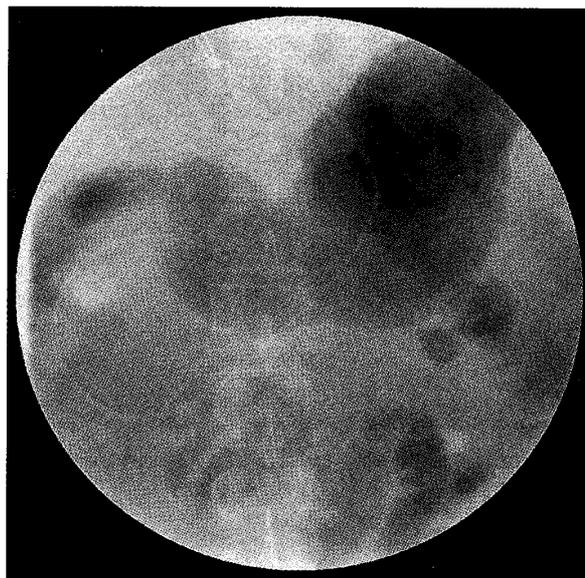


Figure 3 Radiographic view shows demonstrate a 6F pigtail nasocystic drainage catheter inserted into the pseudocyst.

pig-tail biliary stent was placed to drain the cavity (Fig. 4). The patient responded well to treatment, and the laboratory values normalized. A follow-up CT scan 2 months later showed that the pancreatic pseudocyst had disappeared (Fig. 5). The patient had an uncomplicated recovery and has been asymptomatic for 11 months.



Figure 4 Endoscopic and radiographic views demonstrate the 7F double pigtail biliary stent that was placed to drain the cavity.

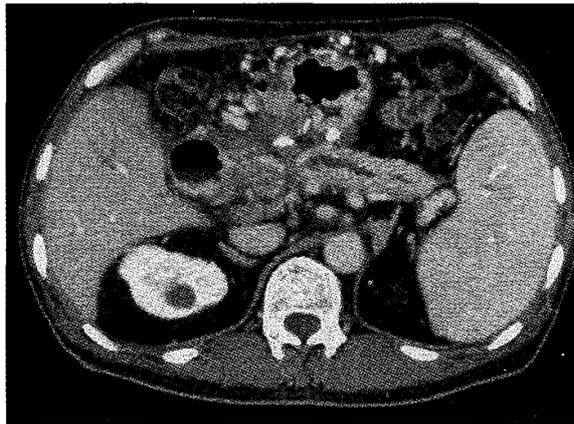


Figure 5 Follow-up CT scan 2 months later shows that the pancreatic pseudocyst has disappeared.

### Discussion

Obstructive jaundice caused solely by a pancreatic pseudocyst is rare<sup>1,5,6</sup>. Patients with chronic pancreatitis sometimes develop obstructive jaundice caused mainly by a fibrotic stricture of the intrapancreatic bile duct<sup>1,3,4,7</sup>. Simple drainage of the pseudocysts is not effective in these cases. Sidel *et al.*<sup>8</sup> suggested 4 criteria for confirming that jaundice is caused by a pancreatic pseudocyst : 1) the presence of a biliary obstruction ; 2) demonstration that the common bile duct is compressed by the pseudocyst ; 3) relief of the biliary obstruction by drainage of the pseudocyst ; and 4) the complete disappearance of jaundice during the postoperative period. The clinical course of our case satisfied these 4 criteria. There have been reported such cases treated by surgery<sup>5,9</sup>, percutaneous<sup>2,5</sup>, transpapillary<sup>5,10</sup>, and endoscopic transmural drainage without EUS-guidance<sup>11</sup>. EUS-guided drainage solely has not been reported in previous cases.

It is important to determine the indication for drainage of pancreatic pseudocysts to reduce

complications. Indications for drainage are presence of symptom, enlargement of cyst, and infection<sup>12</sup>. Pancreatic pseudocysts that have a diameter greater than 6 cm and chronic pseudocysts (>6 weeks duration) are less likely to resolve spontaneously and need to be treated<sup>13</sup>. For mature cysts, endoscopic drainage is less invasive and easier to perform with better outcome<sup>12</sup>. Our patient's pseudocyst was a chronic pseudocyst that was first noticed 8 months after an episode of acute pancreatitis. It is likely that the patient developed pancreatic ductal disruption at the time of the acute non-alcoholic necrotizing pancreatitis. We decided to treat the pseudocyst due to its chronic nature and the presence of obstructive jaundice, abdominal pain, nausea, and vomiting.

EUS-guided drainage is considered to be a safe and certain method of treatment for pancreatic pseudocysts, when EUS is available<sup>14-20</sup>. Various options are available for treating pancreatic pseudocysts, including endoscopic (transpapillary<sup>10</sup>, EUS-guided<sup>13-20</sup>, and under direct vision<sup>11</sup>), percutaneous<sup>2,5</sup>, surgical<sup>9</sup>, and conservative. EUS-guided drainage has the advantages of being able to avoid vessels and pseudoaneurysms, identifying the most preferable puncture site, and distinguishing a pseudocyst from a cystic neoplasm<sup>14</sup>. Although the complication rate associated with EUS-guided drainage is much lower than that associated with transpapillary drainage, EUS-guided complications are more serious<sup>16</sup>. If EUS findings include the presence of extensive extragastric collateral vessels and gastric varices, inadequate apposition of the pseudocyst with the gut wall, pseudocyst wall > 1 cm, pseudocyst distance from enteric wall > 1 cm, or pseudaneurysm, transmural drainage should be avoided because of high risk of bleeding<sup>16</sup>. As regards extragastric collateral, Sriram PV, et al<sup>21</sup>. reported pseudocyst complicated by portal hypertension or intervening vessels can be safely drained under EUS guidance. To avoid complications, especially bleeding, we confirmed there were no intervening vessels between gut wall and pseudocyst by contrast enhanced CT scan with multiplanar reconstructions images and EUS with power Doppler imaging before drainage. Additionally, CT scan and EUS finding revealed pseudocyst wall < 1 cm, pseudocyst distance from enteric wall < 1 cm, no gastric varices or pseudoaneurysms.

In the cases complicated by obstructive jaundice, ERCP should be performed whenever possible beforehand to define the pancreatic duct anatomy and identify any ductal disruption<sup>11,14</sup> and common bile duct compression by pseudocyst<sup>5,10</sup>. If a pancreatic ductal stricture or a duct-cyst communication is identified at ERCP, a stent should be placed across the site of disruption or into the cavity prior to EUS-guided or percutaneous drainage<sup>14</sup>. If cholangiography reveals a obstruction of the common bile duct apparently compressed by pseudocyst and successful drainage for pseudocyst is performed, biliary drainage is not always necessary<sup>5,10</sup>. If the transpapillary approach fails or if the pseudocyst is not communicating with the pancreatic duct, EUS-guided transenteric drainage should be done<sup>16</sup>. Particularly when the location of the cyst is separate from the gut wall, surgical management should be selected for cases of non-communicating cyst with the pancreatic duct or endoscopic transpapillary failure<sup>9</sup>. We did not perform ERCP because the patient had only recently had a necrosectomy for severe acute pancreatitis and we wanted to avoid post-ERCP pancreatitis. Thus, we performed EUS-guided drainage. If the initial drainage had not been effective, the next step would have been an

endoscopic transpapillary approach or surgical treatment.

If the EUS findings suggest the presence of necrosis within a pseudocyst or infection of the cyst, it is more desirable to use a nasocystic catheter than a plastic endoprosthesis for initial drainage. The presence of necrosis increases the risk of infection in the pseudocyst after endoscopic decompression<sup>14</sup>. We selected nasocystic tube because infection of the pseudocyst was suspected. Furthermore, stent migration into the pseudocyst was reported in a case of initial drainage<sup>22</sup>. Nasocystic drainage has the advantage of allowing one to monitor the fluid volume. It also allows repeated biochemical, cytological, and bacteriological examination of the cyst fluid, cyst lavage, and cystography. In cases with a pancreatic duct-cyst communication or a long-term pre-existing pseudocyst, after several weeks of nasocystic drainage, placement of a plastic endoprosthesis is required to permit continuous drainage. Conclusive evidence to establish the appropriate duration of stent placement has not been reported. To date, the stent in our case has remained in place for 8 months without any complications on the assumption that patient has a pancreatic duct-cyst communication.

Successful simple EUS-guided drainage has not been reported in previous cases of obstructive jaundice caused solely by a pancreatic pseudocyst. This method should be chosen for the treatment of similar cases because of the safety and the accessibility if transpapillary approach fails or is not available.

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## EUS 下ドレナージが有効であった閉塞性 黄疸合併腓仮性嚢胞の1例

宮谷 博幸	吉田 行雄	牛丸 信也
工藤 康孝	本田 英明	村山 淳子
澤田 幸久	中島 嘉之	宇賀神卓広
落合 香織	鷺原 規喜	中村 郁夫

### 要 約

症例 48歳男性 2004年4月に急性膵炎にて膵頭部の necrosectomy の既往あり。術後、外来にて経過観察中に膵頭部に8 cm大の腓仮性嚢胞が出現した。膵嚢胞圧迫による閉塞性黄疸および肝機能障害を生じたため、2005年4月加療目的に入院した。入院後 EUS 下に胃体下部後壁より膵嚢胞を通電穿刺、6F pig-tail カテーテルを経鼻的に嚢胞内に留置しドレナージを施行した。穿刺時に胃内腔側に出血を認めたが、自然止血された。2週間後、経鼻カテーテルを抜去

し、ガイドワイヤー下に7F、3 cm長の両端 pig-tail biliary stent を留置した。その後、黄疸および膵嚢胞は消失し、検査成績も正常化した。外来にて11ヶ月間観察中であるが、膵嚢胞の再発なく経過良好である。閉塞性黄疸を合併した膵仮性嚢胞症例は比較的稀であり、手術や PTBD を併用した経乳頭的治療、経皮嚢胞ドレナージなどの報告はあるが、EUS 下ドレナージのみにより治療し得た症例報告は検索範囲で存在しないため、今回報告する。