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CASE REPORT

Stent displacement in endoscopic pancreatic pseudocyst drainage and endoscopic management

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Abstract

A pancreatic pseudocyst (PPC) is a collection of pancreatic fluid enclosed by a non-epithelialized, fibrous or granulomatous wall. Endoscopic pancreatic pseudocyst drainage (PPD) has been widely used clinically to treat PPCs. The success and complications of endoscopic PPD are comparable with surgical interventions. Stent displacement is a rare complication after endoscopic PPD. Almost all the complications of endoscopic PPD have been managed surgically, and there is rare report involving the endoscopic treatment of intraperitoneal stent displacement. We report here a case of stent displacement after endoscopic ultrasound- and fluoroscopy-guided PPD in a 41-year-old female patient with a PPC in the tail of the pancreas. The endoscopic treatment was successfully performed to remove the displaced stent. The clinical course of the patient was unremarkable. The cyst had significantly reduced and disappeared by 12 wk. We found that both endoscopic ultrasound and fluoroscopy should be used during endoscopic PPD to avoid stent displacement. The displaced stent can be successfully treated by endoscopic removal.

Key words: Endoscopic management; Endoscopic ultrasound; Pancreatic pseudocyst; Stent displacement

Core tip: Almost all the complications of endoscopic pancreatic pseudocyst drainage have been managed surgically, and there is rare report involving the endoscopic treatment of intraperitoneal stent displacement. This case report not only presents a possible cause of stent displacement during endoscopic ultrasound-pancreatic pseudocyst drainage, but also discusses a novel method of endoscopic stent removal.

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INTRODUCTION

A pancreatic pseudocyst (PPC) is a collection of pancreatic fluid enclosed by a non-epithelialized, fibrous or granulomatous wall. PPCs are likely to develop within 20%-40% of patients with chronic pancreatitis[1]. When PPCs persist > 6 wk[2,3] and/or are associated with clinical symptoms, surgical, percutaneous, or endoscopic

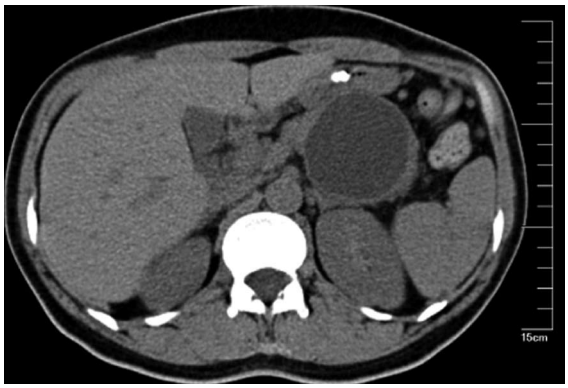

Figure 1 Abdominal contrast computed tomography scan of the lesion.

pancreatic pseudocyst drainage (PPD) should be performed[4-6]. Over the past two decades, endoscopic ultrasound (EUS) has become an essential tool for the diagnosis and therapy of PPCs and EUS-guided PPD (EUS-PPD) has been widely used clinically. EUS-PPD can be performed using the transmural placement of a stent. The success and complications of EUS-PPD are comparable with or better than the results reported from surgical interventions[5,7]. Stent displacement is a rare complication after endoscopic PPD. The morbidity of stent displacement is approximately 4% according to a previous report[8]. Almost all of the endoscopic PPD complications have been managed surgically, and reports involving the endoscopic treatment of intraperitoneal stent displacement are rare. We report a case in which the stent displacement was resolved by endoscopic treatment in a 41-year-old female patient with a PPC in the tail of the pancreas.

CASE REPORT

A 41-year-old non-alcoholic woman who had chronic pancreatitis for two years was admitted to the hospital with a complaint of intermittent painful swelling in the epigastrium that had been present for 12 d. The physical examination during the patient's check-up showed epigastric pain and active bowel sounds. No masses were evident during abdominal palpation. Blood samples taken at the time of admission showed: hemoglobin, 11.7 g/dL; total leukocyte count, 4000; platelet count, 149000; lipase level, 180; fasting blood glucose, 14.63 × 10^9/L; total bilirubin, 20.9 × 10^9/L; and direct bilirubin, 9.9 × 10^9/L. The amylase, carcinoembryonic antigen, carbohydrate antigen (CA) 125, and CA 19-9 levels, and liver and kidney function tests were within the normal range.

An abdominal contrast CT scan revealed an atrophic pancreatic parenchyma and a well-defined cystic lesion with a diameter of 5.3 cm located in the tail of the pancreas (Figure 1). On EUS, a 4.7 cm × 5.6 cm near-circular unilocular cystic lesion in the tail of the pancreas without continuity to the main pancreatic duct was noted, which was consistent with a pseudocyst (Figure 2A). Fine needle aspiration cytology of the cystic fluid showed no malignant cells. The amylase level was extremely high (22593 U/L). The carcinoembryonic antigen and CA 19-9 concentrations in cyst fluid of the PPC were 64 ng/mL and 35 U/mL, respectively. Based on these findings, we considered the patient to have a symptomatic PPC.

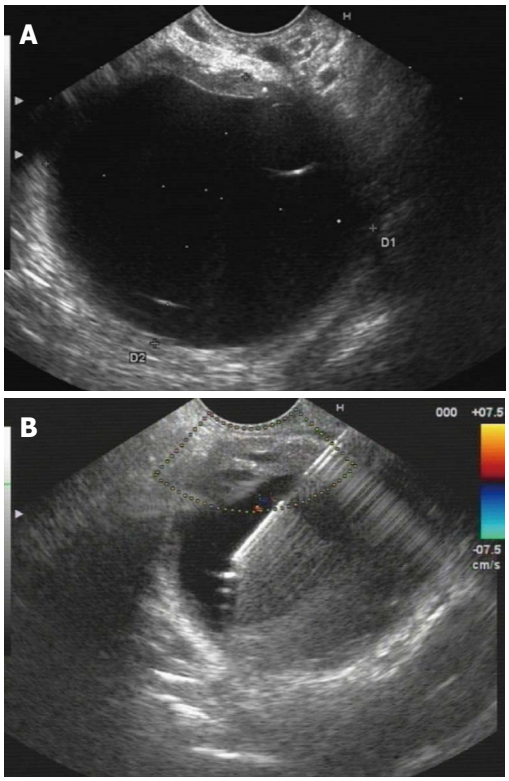

Figure 2 Endoscopic ultrasound. A: Endoscopic ultrasound view of the lesion; B: Color Doppler ultrasonography was applied to identify the regional vasculature and used during endoscopic ultrasound-guided puncture.

The drainage procedure was carried out with propofol sedation and continuous cardiorespiratory monitoring. Under fluoroscopic and EUS guidance, endoscopic PPD was performed in the lesser curvature of the stomach. Color Doppler ultrasonography was applied to identify the regional vascular structures (Figure 2B). An aspiration needle was inserted into the pseudocyst under EUS guidance.

The following steps were guided by fluoroscopy. A guide wire was introduced through the needle and coiled as a quasi-circular shape under fluoroscopy. A cystenterostomy fistula was created using a 10 Fr cystenterostome. The fistula was dilated with a 10 mm balloon. Under fluoroscopic guidance, one 10 Fr double-pigtail plastic stent was placed (Figure 3).

After the procedure, the patient complained of mild abdominal pain. Three days after EUS-guided drainage, the abdominal pain worsened. A bulge was noted on abdominal examination. Localized tenderness in the epigastrium was noted on deep palpation without muscle spasm or rebound tenderness. A CT scan showed that the entire stent had migrated into the lesser peritoneal

Figure 3 Fluoroscopic view during stent placement.

sac, and there were large amounts of gas in the peritoneal cavity (Figure 4A). A decision was made to remove the stent and perform endoscopic drainage again.

The fistula in the lesser curvature of stomach was seen and dilated using a 10 mm balloon. We advanced the endoscope into the lesser peritoneal sac, and removed the stent with foreign body forceps. A nasobiliary drainage tube was placed in the lesser peritoneal sac via the transgastric fistula. We then performed endoscopic drainage in the posterior wall of the stomach, and placed one 10 Fr double-pigtail plastic stent into the pseudocyst guided by EUS. A nasogastric tube was then placed in the gastric cavity. Peritoneocentesis was performed and the gas in the peritoneal cavity was released.

After 3 d of expectant treatment, the clinical symptoms (abdominal pain and swelling) were resolved. A repeat CT scan of the abdomen 3 d after treatment showed that the cyst had significantly shrunk. The gas in the peritoneal cavity was clearly reduced (Figure 4B). The patient was discharged and a follow-up was conducted by phone and clinic appointment. The PPC disappeared as observed by CT scan 12 wk later (Figure 4C).

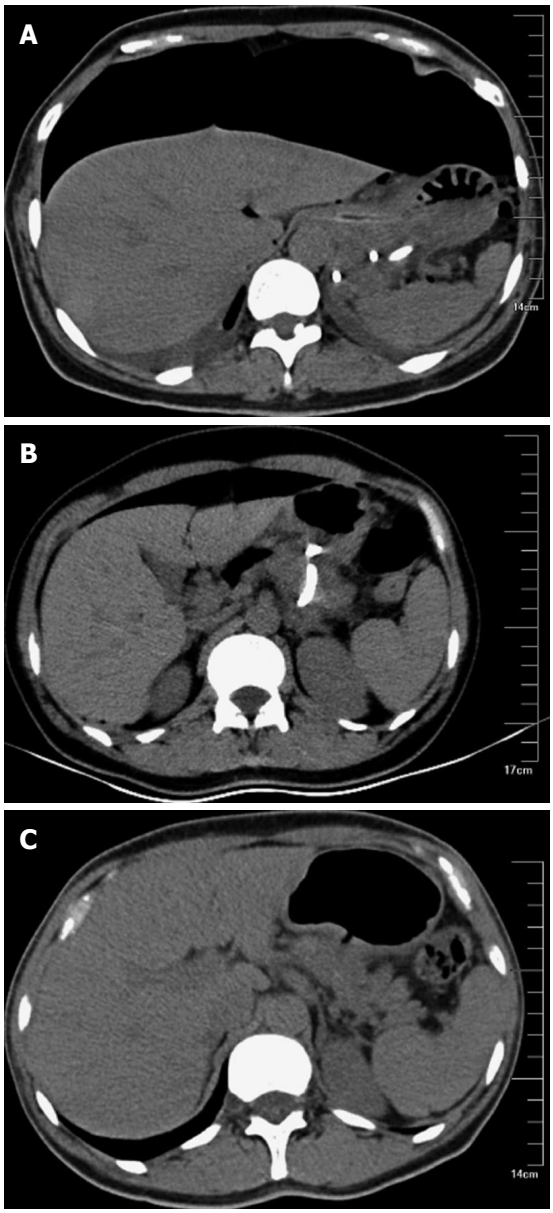

Figure 4 Computed tomography scan. A: Showing stent migration and pneumoperitoneum after 3 d of the procedure; B: After 3 d of the stent removal and replacement; C: Twelve weeks later.

DISCUSSION

Since Grimm first reported EUS-PPD in 1992, EUS-PPD has become the standard procedure for treating symptomatic PPCs[9-13]. During EUS-PPD, EUS can help identify mucinous cystic neoplasms and relative contraindications to endoscopic drainage, such as a distance > 1 cm and normal intervening pancreatic parenchyma[14]. Several authors have directly compared the success and complication rates of endoscopic drainage with surgical therapy and have found them to be comparable[15,16]; however, EUS-PPD has less morbidity, a faster recovery, and is less invasive and expensive than surgery[6,13,17,18].

Previous reports have shown a success rate of > 90% for EUS-PPD in patients with chronic pseudocysts[6,19]. The recurrence rate after EUS-PPD is approximately 4%, and the complication rate is < 16%[20]. In a prospective study with 99 patients, the short-term success rate of EUS-PPD was 93% and the long-term success rate was 84%; complications occurred in 19% of cases[5]. The major complications of EUS-PPD include immediate or delayed infection (0%-8%), bleeding (0%-9%), retroperitoneal perforation (0%-5%), and stent displacement (4.0%-6.5%)[2,5,8,21-24]. In the present case, the guide-wire introduction and stent placement were guided only by fluoroscopy. When introduced through the needle, the guide-wire was coiled in a quasi-circular shape under fluoroscopy, which suggested that the wire remained in the cyst. However, because fluoroscopy only provides a two-dimensional image, the migration vertical to the X-ray might have been overlooked. Thus, the stent displacement may have primarily been due to the lack of EUS imaging during the placement and confirmation

of the stent location. Hence, EUS imaging should be monitored from the beginning to the ending of endoscopic PPD.

According to previous reports, almost all stent displacements are managed surgically[25-27]; however, recent advances in therapeutic endoscopy, as well as the development of natural orifices transluminal endoscopic surgery, allow removal of the migrated stents without surgery. There are some case reports involving the endoscopic treatment of stent displacement after EUS-PPD. Mahnken *et al*[28] reported a case of immediate transgastric repositioning of the dislocated drainage stent with a snaring technique guided by fluoroscopy. Varadarajulu[29] reported a similar case in which a stent was successfully removed using a balloon dilator by fluoroscopic guidance. Chung *et al*[30] reported the successful endoscopic removal of a migrated double-pigtail stent through a pancreaticoduodenal fistula tract that developed > 6 years after the stent was originally misplaced into the pseudocyst. We report here that endoscopic treatment was successfully performed to remove the migrated stent. The clinical course was unremarkable. The cyst had significantly reduced in size after 3 d, and had disappeared by 12 wk.

In conclusion, both EUS and fluoroscopy should be used during EUS-PPD to avoid stent displacement. The misplaced stent can be successfully treated by endoscopic removal.

COMMENTS

Case characteristics

A 41-year-old non-alcoholic woman who had chronic pancreatitis for two years presented with intermittent painful swelling in the epigastrium that had been present for 12 d.

Clinical diagnosis

Symptomatic pancreatic pseudocyst.

Differential diagnosis

Pancreatic serous cystadenoma; pancreatic mucinous cystadenoma.

Laboratory diagnosis

Upon admission: hemoglobin, 11.7 g/dL; total leukocyte count, 4000; platelet count, 149000; lipase level, 180; fasting blood glucose, 14.63 × 10^9/L; total bilirubin, 20.9 × 10^9/L; and direct bilirubin, 9.9 × 10^9/L. The amylase, carcinoembryonic antigen, carbohydrate antigen (CA) 125, and CA 19-9 levels, and liver and kidney function tests were within the normal range. The amylase level in cyst fluid of the PPC was 22593 U/L. The carcinoembryonic antigen and CA 19-9 concentrations in cyst fluid were 64 ng/mL and 35 U/mL, respectively.

Imaging diagnosis

Computed tomography scan revealed an atrophic pancreatic parenchyma and a well-defined cystic lesion with a diameter of 5.3 cm located in the tail of the pancreas. Endoscopic ultrasound (EUS) showed a 4.7 cm × 5.6 cm near-circular, unilocular cystic lesion in the tail of the pancreas without continuity to the main pancreatic duct.

Pathological diagnosis

Fine needle aspiration cytology of the cystic lesion showed no malignant cells.

Treatment

The patient was treated with endoscopic pancreatic pseudocyst drainage guided by EUS and fluoroscopy.

Related reports

According to previous reports, almost all stent displacements are managed surgically, however, recent advances in therapeutic endoscopy allow removal of the migrated stents without surgery.

Term explanation

A pancreatic pseudocyst is a collection of pancreatic fluid enclosed by a non-epithelialized, fibrous or granulomatous wall. When pancreatic pseudocysts persist > 6 wk and/or are associated with clinical symptoms, surgical, percutaneous, or endoscopic pancreatic pseudocyst drainage (PPD) should be performed. EUS-guided PPD has been widely used clinically.

Experiences and lessons

This case report presents a possible cause for stent displacement during EUS-guided PPD, and discusses a novel method of stent removal by endoscopy.

Peer-review

The authors describe a case of a patient with an unusual complication of a transgastric stent insertion and subsequent non-surgical management, which is an interesting case report.

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