Stent migration following treatment of pancreatic pseudocyst by cyst gastrostomy

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ABSTRACT

Pancreatic pseudocysts are collections of fluid that form as a complication of pancreatitis. Multiple treatment modalities are available; however, stent placement guided by endoscopic ultrasound has become the therapy of choice due to lower complication rates. We present an uncommon case of self-expandable stent migration following endoscopic drainage of a pancreatic pseudocyst.

KEYWORDS Complications; lumen-apposing self-expanding metal stents; pancreatic pseudocysts; pancreatitis

Pancreatic pseudocysts are collections of fluid that form most commonly as a complication of pancreatitis. Management options include observation as well as surgical, percutaneous, and endoscopic drainage. Stent placement guided by endoscopic ultrasound has become the preferred option because of its lower complication rates compared to surgical and percutaneous techniques. Common complications of endoscopic stent placement include puncture of adjacent organs, perforation, and bleeding. However, another uncommon complication is stent migration. Despite improvement in stenting techniques and stent design, migration of the stent continues to be an issue. We present a case of lumen-apposing self-expandable metal stent (LASEMS) migration following endoscopic drainage of a pancreatic pseudocyst.

CASE REPORT

A 54-year-old woman was admitted and treated for acute pancreatitis. Following resolution of her symptoms, she was discharged with outpatient follow-up. She later developed ongoing abdominal pain requiring multiple readmissions. Computed tomography of the abdomen and pelvis revealed the formation of a 14 × 13 cm pseudocyst, prompting outpatient endoscopic ultrasound (EUS) with cystogastrostomy in the setting of ongoing abdominal pain.

EUS showed a simple, thin-walled, unilocular cyst consistent with a large pancreatic pseudocyst, filled with clear, echolucent fluid and a small amount of echogenic debris. Cyst

gastrostomy was performed with successful placement of an Axios 15 × 10 mm dual-flanged covered metal stent (*Figure 1a*). More than 2 L of fluid was suctioned from the stomach following stent deployment. Five weeks later, upon clinical improvement and the demonstration of pseudocyst decompression noted on repeat computed tomography, plans for stent removal were made. At the time of endoscopy, the Axios stent was noted to have migrated into the pseudocyst cavity (*Figure 1b*). The edge of the stent was grasped with rat tooth forceps and loosened by moving the stent in a back-and-forth motion (*Figure 1c*). It could then be removed without complication, and surgical intervention could be avoided.

DISCUSSION

Pancreatic fluid collections (PFCs) are a frequent complication of pancreatitis. The revised Atlanta criteria classify PFCs as either acute or chronic, with pancreatic pseudocyst being a chronic PFC. Correct classification of PFCs is important in guiding management, because both interventions and outcome data are dependent on the type of PFC being addressed. Pancreatic pseudocyst is defined by the revised Atlanta criteria as an encapsulated collection of fluid with a well-defined inflammatory wall occurring at least 4 weeks after the onset of pancreatitis.¹

Pancreatic pseudocysts are a common complication of pancreatitis episodes, occurring in 5% to 15% of cases.² Management of pseudocysts includes observation or drainage. As many as 33% of pseudocysts are expected to resolve

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Figure 1. (a) Self-expanding metal stent deployment with gastric portion of stent noted within the stomach. (b) Stent migration into the pseudocyst cavity. (c) Stent grasped by rat tooth forceps prior to stent extraction.

spontaneously after diagnosis.³ Indications for drainage of a pseudocyst depend on the presence of symptoms or complications, which can include abdominal pain, gastrointestinal or biliary obstruction, vascular compression, or infection.¹

Historically, surgical drainage involving either open or laparoscopic cystogastrostomy was primarily performed. Later, percutaneous drainage using an external drainage catheter became an efficacious option for pseudocyst drainage. However, with the advancement of endoscopic therapies, including conventional transmural drainage and EUS-guided transmural drainage, endoscopic procedures have been increasingly utilized due to their similar success rates and comparable complication rates. Furthermore, endoscopic therapy has been associated with a shorter hospital stay, lower cost, and improved quality of life scores compared with surgical drainage.⁴

Transmural drainage using endoscopic procedures has become a mainstay in the treatment of pseudocysts. Conventional transmural drainage is a procedure whereby the pseudocyst bulge is visualized in the gastric lumen and a drainage catheter is used to create a lumen between the cyst and the gastric space. One of the main limitations of this technique is the need to visualize the PFC bulge in the gastric lumen, because this is absent in up to 48% of PFCs.⁵ The development of EUS-guided transmural drainage allowed operators to directly visualize the PFC during cannulation prior to stent placement, regardless of whether a bulge is visualized. Kahaleh et al demonstrated similar short- and long-term success and complication rates of conventional and EUS-guided PFC drainage.⁶

The landscape of PFC drainage has continued to change with a shift from plastic stents to fully covered self-expanding metal stents (FCSEMS) and, more recently, LASEMS. Plastic stents were traditionally used. However, they are used less often due to stent occlusion rates of up to 18%, necessitating stent exchange or introduction of multiple stents.⁷ The larger diameter of FCSEMS and LASEMS decreases the risk of occlusion. Furthermore, a study of 230 patients comparing plastic and metal stents showed that pseudocysts drained with plastic stents were complicated by adverse events nearly twice as frequently as FCSEMS (31% vs 16%) and had a decreased complete resolution rate (89% vs 98%).⁸ Despite their success rate in PFC drainage, FCSEMS often were complicated by stent migration. The LASEM, with its “dumbbell” shape with flanges on either side of the lumen, aimed to decrease stent migration and was used in our patient.

Despite efforts to decrease stent migration, this remains a concerning complication. In a systematic review of LASEMS placed for PFCs, Patil et al listed three complications of stent migration in 298 cases.⁹ One issue that has not been addressed is stent migration in relation to duration of stent placement. Manufacturers indicate that the Axios stent is intended for implantation for up to 60 days. In our case, the stent was in place for approximately 35 days. Lastly, a study evaluating endoscopic suturing of the stents placed for esophageal leaks and stricture showed that stent fixation through suture is safe and associated with a decreased migration rate (33% vs 16%) compared to nonsutured stents. In our case, we were able to safely remove the stent with forceps; however, there is not an adequate report of outcomes in stent migration and how often surgical intervention is required. Future studies should be done to assess duration and its relation to stent migration, as well as to assess migration in stent suturing in LASEMS placed for PFCs.

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