Case Report

Endoscopic ultrasound-guided insertion of a large diameter fully covered self-expandable metallic stent as rescue therapy for recurrent infected walled off pancreatic necrosis after surgical necrosectomy

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ABSTRACT

A 39-year-old man developed severe necrotizing gallstone pancreatitis complicated by infected pancreatic necrosis. Surgical necrosectomy was performed to control the on-going sepsis. Subsequently, there was a recurrence of an infected necrotic collection at the site of surgical necrosectomy, in the region of the pancreatic body and tail. He did not respond to conservative treatment with intravenous antibiotics. Pancreatic duct stenting was performed to treat pancreatic duct leak, followed by endoscopic ultrasound guided insertion of a large diameter fully covered self-expandable metallic stent to drain the infected collection. There was rapid and complete clinical recovery.

Key words: Drainage, endoscopic ultrasound, necrosectomy, pancreatic necrosis

INTRODUCTION

There has been a paradigm shift in the management of infected pancreatic necrosis. Delayed, rather than immediate intervention is preferred as it is associated with better clinical outcomes. There is a shift to less invasive interventions such as minimally invasive surgical necrosectomy and endoscopic drainage and necrosectomy, with open laparotomy reserved as a salvage procedure.[1,2] We report a case of infected walled off pancreatic necrosis that initially underwent open laparotomy and surgical necrosectomy. This was complicated by recurrent infected necrotic collection. The patient subsequently underwent successful endoscopic ultrasound (EUS)-guided insertion of a large diameter fully covered self-expandable metallic stent (SEMS), followed by endoscopic necrosectomy. This case highlights the utility of EUS-guided drainage as a salvage procedure even after surgical necrosectomy.

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CASE REPORT

A 39-year-old Chinese man was first admitted for severe necrotizing gallstone pancreatitis. He underwent laparotomy, adhesiolysis, pancreatic necrosectomy and open cholecystectomy 3 weeks later in order to control on-going sepsis. Postoperatively intraabdominal bleeding occurred from gastroduodenal artery pseudoaneurysm necessitating repeat laparotomy and on table mesenteric angiogram and embolization. The postoperative course was also complicated by enterocutaneous fistula. After a protracted hospital stay, he was finally discharged after almost 4 months. However, he was readmitted 3 days later due to increased discharge from the enterocutaneous fistula. He was septic, with a maximum

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temperature of 39° Celsius and serum C-reactive protein was 185.7 mg/dl (normal: <3 mg/dl). He was started on intravenous antibiotics. Computed tomography (CT) of the abdomen revealed interval development of a loculated collection about 6 cm in maximum diameter at the site of the previous pancreatic necrosectomy in the pancreatic body and tail region [Figure 1]. He was then referred for consideration of endoscopic intervention. Endoscopic retrograde pancreatography demonstrated pancreatic duct leak [Figure 2] and pancreatic duct stenting was performed [Figure 3]. Subsequently EUS-guided transgastric drainage of the collection was performed. Using a therapeutic linear echoendoscope, the walled off necrotic collection was visualized [Figure 4] and a 19-guage fine needle aspiration needle (Echotip; Cook Medical, Winston-Salem, USA) was used to puncture the collection, followed by insertion of a 0.035" guide wire, and graded dilatation of the puncture tract using a 6 Fr then 7 Fr co-axial dilator (Soehendra dilator, Cook Endoscopy, Winston-Salem, USA). A balloon dilator (CRE balloon, Boston Scientific, Natick, USA) was then used to dilate the tract to 8 mm, followed by insertion of a 16 mm diameter 30 mm long fully covered SEMS specifically designed for drainage of walled off pancreatic fluid collections (NAGI SEMS; Taewoong-Medical Co., Seoul, South Korea) [Figure 5]. A gastroscope was inserted across the SEMS into the cavity of the collection the next day. The minimal necrotic debris present [Figure 6] was removed with irrigation and endoscopic suctioning. The patient made a rapid recovery with resolution of the fever within a day. The enterocutaneous fistula also resolved without the need for further intervention. Repeat CT at 1 week demonstrated resolution of the collection. The SEMS was easily removed after 8 days using rat-tooth forceps during upper gastrointestinal endoscopy. The pancreatic stent was removed after 6 weeks, and the patient remained well on outpatient follow-up 3 months after SEMS removal.

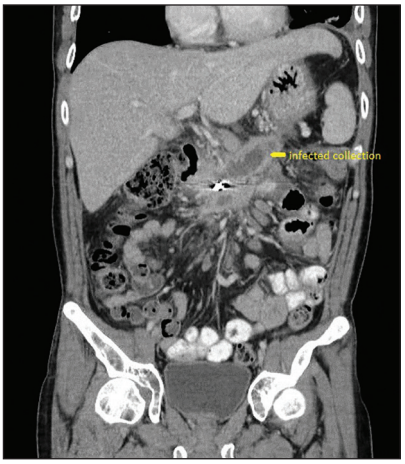

Figure 1. Computed tomography image of infected walled off pancreatic necrosis

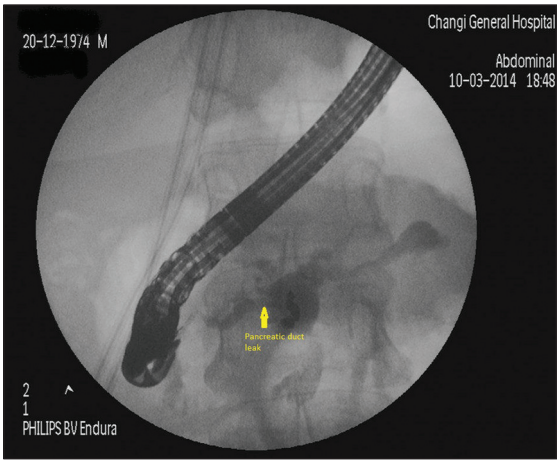

Figure 2. Endoscopic retrograde pancreatography demonstrated pancreatic duct leak

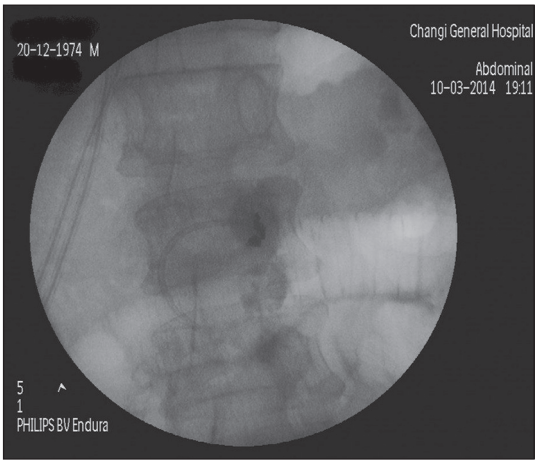

Figure 3. Pancreatic duct stenting was performed

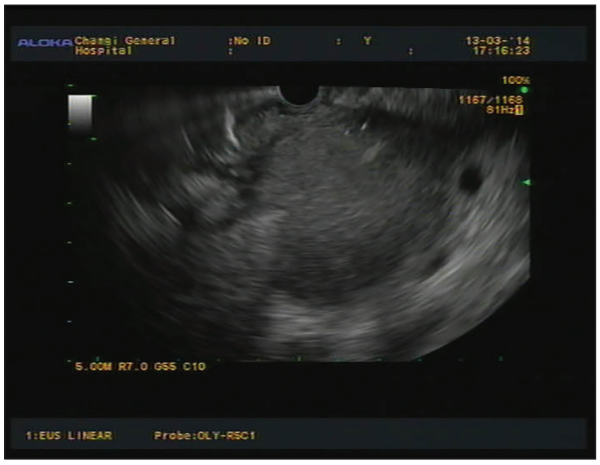

Figure 4. Endoscopic ultrasound image of the infected collection

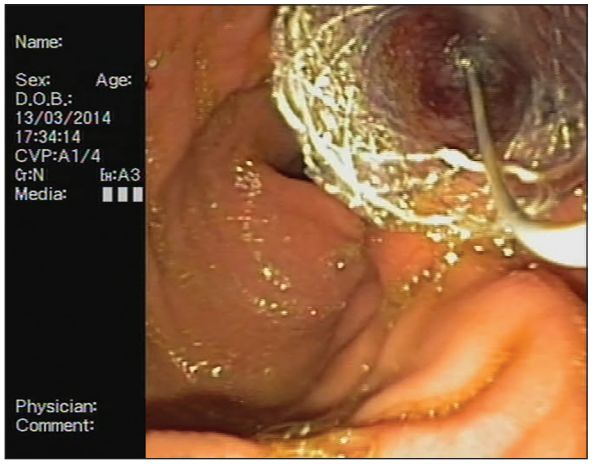

Figure 5. Endoscopic view of the deployed "NAGI" self-expandable metallic stent

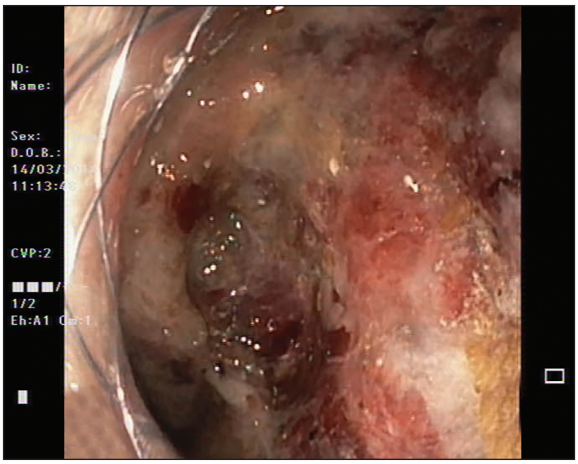

Figure 6. Endoscopic view within the necrotic cavity

DISCUSSION

Endoscopic ultrasound-guided endoscopic drainage of pseudocysts has been shown to be superior to non-EUS-guided endoscopic drainage[3,4] and equivalent to surgery in terms of efficacy but at lower costs and with lower patient morbidity.[5] Endoscopic management of pseudocysts involves transmural insertion of single or multiple double pigtail stents for internal drainage. However, this type of drainage is usually inadequate in the context of infected walled off pancreatic necrosis, and to increase the success rate of endoscopic therapy, endoscopic necrosectomy is often required.[6-8] This involved dilatation of the size of the cystogastrostoma to at least 15 mm using balloon dilators to facilitate insertion of a gastroscope for endoscopic necrosectomy. It usually requires more than one treatment session and frequently there is a need to repeat dilatation of the cystogastrostoma, as the opening tends to narrow with time. In addition, the angulation of the opening may pose a challenge for repeat insertion of an endoscope into the necrotic cavity. As an alternative to a standard plastic double pigtail stent which has a maximum inner diameter of only 3.3 mm (10 Fr), recent publications have explored the use of SEMS which are larger in diameter and more effective for drainage. These were initially adopted from enteral SEMS, but that gave rise to the problem of stent migrations because these SEMS had straight configurations. SEMS specially designed for drainage purpose characterized by short lengths and anti-migration features have been introduced.[9,10] The AXIOS™ stent (XLUMENA, California, USA) is a fully covered SEMS with two large flanges to hold the tissue layers together and a large diameter for effective drainage.[9] The "NAGI" covered SEMS, which was used in this case report, is another specially designed SEMS with a 10, 12 or 16 mm diameter in the center and 20 mm ends which can reduce the risk of migration. The advantages of SEMS are a larger drainage orifice (16 mm in our case example) and ease of insertion of gastroscope into the cavity of the infected necrosis for endoscopic necrosectomy. In fact, with a larger drainage orifice, it is easier for loose necrotic debris to flow out spontaneously, thus reducing the need for aggressive endoscopic debridement. Long-term clinical follow-up is important in order to monitor for reaccumulation of fluid collections, especially in the context of pancreatic duct disruption. The issue of pancreatic duct disruption must be addressed, in order to prevent recurrence of fluid collections. A period of pancreatic duct stenting, if technically feasible, would be the ideal treatment option.[6] This was performed in our case. To summarize, our case illustrates two important points. First it affirms the utility of SEMS in the treatment of infected walled off pancreatic necrosis. Second it highlights that even after surgical necrosectomy EUS-guided drainage can still be considered as a complementary therapeutic procedure.

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