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CASE REPORT

A Case of Perforated Pancreatic Pseudocyst Complicated by Acute Myocardial Infarction Successfully Treated by EUS-Guided Transgastric Drainage

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ABSTRACT

Context Endoscopic ultrasound guided transmural drainage is a well accepted treatment modality for symptomatic pancreatic pseudocysts. Pseudocyst perforation is an indication for surgery. The safety and utility of endoscopic drainage in the setting of acute myocardial infarction is unknown. This report described a case of perforated pseudocyst in a patient with acute myocardial infarction successfully treated by endoscopic ultrasound guided drainage. **Case report** An 81-year-old man was admitted for acute myocardial infarction precipitated by anemia. Computer tomography showed a 17x11 cm pancreatic pseudocyst. Two days later he developed increased pain and computer tomography showed evidence of pseudocyst perforation. There was further intracystic bleeding that precipitated a second acute myocardial infarction. There was no peritonism presumably due to the fact that the pseudocyst wall had resealed temporarily. He was considered too high risk for surgery and hence underwent endoscopic ultrasound guided pseudocyst drainage. Endoscopic drainage was successful and his symptoms improved. Three weeks later, endoscopic retrograde pancreatography was performed to evaluate the pancreatic duct integrity; this showed a pancreatic duct fistula communicating with the pseudocyst cavity, and pancreatic duct stenting was performed. There was complete resolution of both the pseudocyst and pancreatic duct fistula. Follow-up computer tomography performed 3 months after removal of stents showed no pseudocyst recurrence. **Conclusions** In the setting of acute myocardial infarction and contained pseudocyst perforation, endoscopic ultrasound guided drainage may be performed successfully.

INTRODUCTION

Endoscopic ultrasound (EUS)-guided transmural drainage is a well accepted treatment modality for symptomatic pancreatic pseudocysts [1]. In the context of pseudocyst perforation, surgery is frequently needed. The safety and utility of EUS-guided pseudocyst drainage in the setting of acute myocardial infarction is unknown. This report described a case of perforated pancreatic pseudocyst complicated by acute myocardial infarction successfully treated by EUS-guided transgastric drainage.

CASE REPORT

An 81-year-old Indian male with medical co-morbidities of ischemic heart disease with previous coronary bypass, hypertension, hyperlipidemia and obesity was admitted with symptoms of nausea and abdominal pain. Serum amylase done on admission was 312 U/L, less than 3-times elevated (reference range: 30-162 U/L). The symptoms were attributed to gastroenteritis and he was discharged a day later when symptoms resolved. A month later, he was again hospitalized for one day due to transient abdominal pain and was discharged well. However, the next day, he was readmitted to hospital for acute myocardial infarction precipitated by a decrease in hemoglobin level from 12.1 to 8.5 g/dL (reference range: 14-18 g/dL). The diagnosis of acute myocardial infarction was based on presence of angina, ST segment depression and T wave inversion in the anterolateral leads of the electrocardiogram, as well as an elevated troponin T level of 0.123 ng/mL (normal reference: 0-0.1 ng/mL). There were no overt signs of bleeding such as hemetemesis or melaena and the abdominal examination was unremarkable with no tenderness or masses. He received blood transfusion and the hemoglobin level rose to 10.4 g/dL. He was on aspirin and this was stopped and omeprazole was administered. As there was no evidence of overt gastrointestinal bleeding that would require immediate endoscopic therapy, the managing cardiologist deferred making a referral for diagnostic upper gastrointestinal

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Key words Anemia; Drainage; Endosonography; Pancreas

Abbreviations CT: computer tomography; EUS: endoscopic ultrasound

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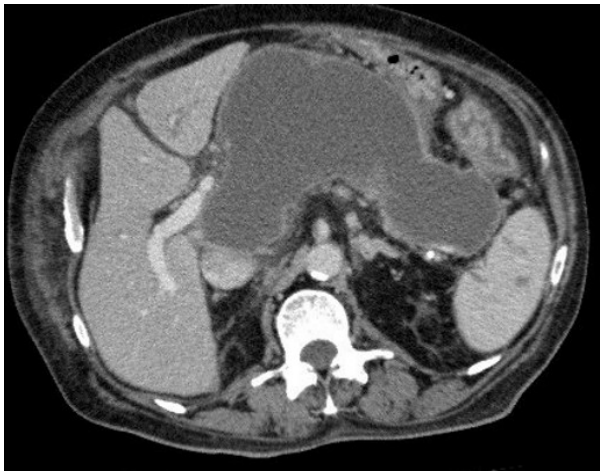

Figure 1. Computer tomography showing the pancreatic pseudocyst.

endoscopy until 9 days later, when it was clear that the cardiovascular status of the patient would remain stable. Endoscopy showed only gastritis; there were no ulcers or cancers that could have accounted for the drop in hemoglobin level. Concurrently a non urgent echocardiogram was arranged to assess the left ventricular function. It showed normal left ventricular ejection of 60% and an incidental cystic intra-abdominal lesion. It was only then that computer tomography (CT) was performed to clarify the nature of this cystic lesion. CT detected a 17x11 cm pancreatic pseudocyst (Figure 1). There was intracystic density consistent with blood. In retrospect, the patient probably developed an episode of acute pancreatitis a month earlier, when he first had abdominal pain, although the serum amylase was less than 3-times elevated; the etiology of the pancreatitis was gallstone pancreatitis but there was no sign of biliary obstruction with normal liver function test and a non dilated bile duct on CT. The episode of pain prior to the acute myocardial infarction probably reflected bleeding into the pseudocyst cavity. Two days later, he developed a transient episode of severe abdominal pain. The hemoglobin level dropped to 8.9 g/dL. CT was repeated and showed that while the pseudocyst remained largely stable in size and configuration, there

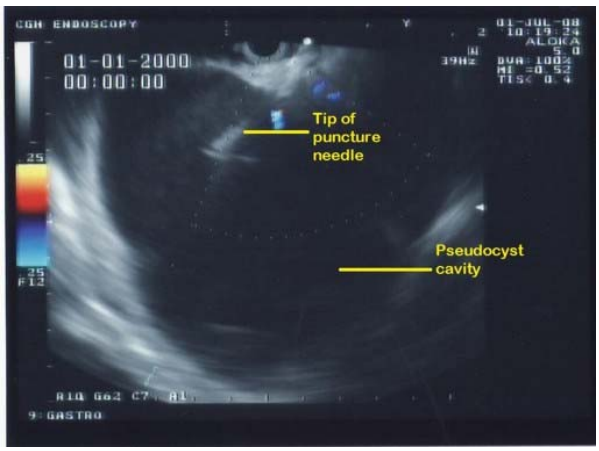

Figure 2. EUS-guided puncture of the pancreatic pseudocyst.

was radiological evidence of perforation at the region of the left hypochondrium with new inflammatory changes and fluid collections with high density consistent with blood. In addition, he suffered another episode of acute myocardial infarction, as evidenced by new ST segment depression in the anterolateral leads of the electrocardiogram as well as an elevation of the troponin T level to 1.29 ng/mL. He was also transiently hypotensive requiring inotropic support. He was judged to be too high risk for surgery, but because of the risk of frank rupture with peritonitis, which could be catastrophic and fatal, the option of non surgical drainage was raised. After discussion, the patient and his family opted for EUS-guided transmural drainage which was performed a day after the second episode of acute myocardial infarction. The patient was sedated with a combination of intravenous midazolam and fentanyl. A therapeutic echoendoscope (GF UCT160^{TM}, Olympus, Tokyo, Japan) was used. The pseudocyst (Figure 2) was visualized and under Doppler ultrasound guidance, it was punctured using a 19G needle (EUSN-19-T^{TM}, Cook Endoscopy, Winston-Salem, NC, USA) *via* a transgastric approach. A 0.035" guidewire (Hydra Jagwire^{TM} Guidewire, Boston Scientific, Natick, MA, USA) was then inserted through the needle into the pseudocyst cavity and the needle was withdrawn. The puncture tract was progressively dilated using a wire-guided needle knife (KD-441Q, Olympus, Tokyo, Japan) followed by balloon dilatation (Figure 3) to 8 mm (CRE^{TM}, Boston Scientific, Natick, MA, USA) and a 10 Fr 7 cm double pigtail stent (Solus^{TM}, Cook Endoscopy, Winston-Salem, NC, USA) was inserted (Figures 4 and 5). The patient tolerated the procedure well and no cardiopulmonary complications developed. Clopidrogel was started a day later for the treatment of acute myocardial infarction. His abdominal symptoms improved and oral feeding was gradually reintroduced.

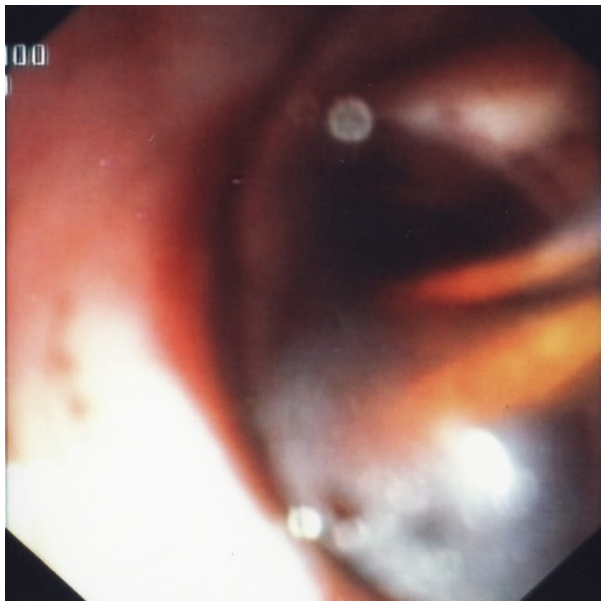

Figure 3. Balloon dilatation of the puncture site was performed to facilitate insertion of a 10 Fr double pigtail transgastric stent.

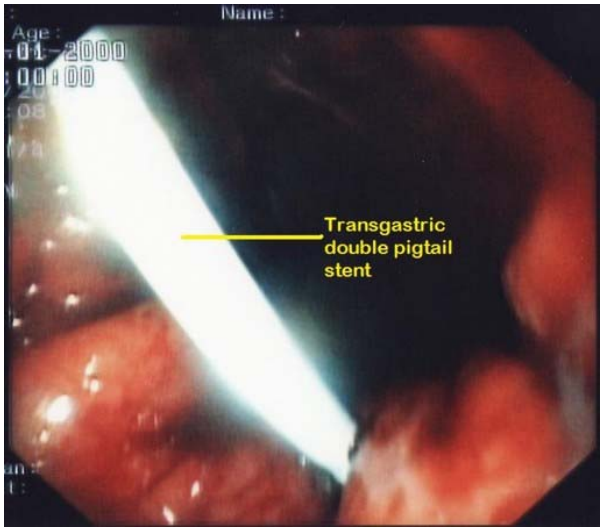

Figure 4. Endoscopic view of a double pigtail transgastric stent.

A week later CT showed interval regression in the size of the pseudocyst (13.5 by 5.5 cm). To facilitate faster resolution, 2 more 10 Fr 7cm transgastric stents were inserted and he was then discharged. Three weeks later, endoscopic retrograde pancreatography (ERP) was performed to evaluate the pancreatic duct integrity. It showed a pancreatic tail fistula (Figure 6) and this was treated by insertion of a 7 Fr pancreatic stent. Two months later CT showed resolution of the pseudocyst while ERP demonstrated healing of the pancreatic duct fistula. The transgastric and pancreatic stents were removed. CT was repeated after a further 3 months and showed no pseudocyst recurrence.

DISCUSSION

There are no published data concerning EUS-guided pseudocyst drainage in the context of a ruptured pseudocyst in a patient with acute myocardial infarction. In this case, the patient probably had an unrecognized episode of acute gallstone pancreatitis when he first presented with abdominal pain a month prior to the detection of ruptured pseudocyst. The perforation was heralded by an episode of intracystic bleeding that precipitated the first acute myocardial infarction episode. Subsequently perforation occurred and triggered another acute myocardial infarction. Although there was spontaneous sealing at the site of perforation, as evidenced by the fact that the contours of the pseudocyst remained largely unchanged, there was a very real risk of another episode that would result in frank rupture with peritonitis and death.

As a rule, EUS-guided pseudocyst drainage would have been regarded as the first treatment option, when the expertise is available. A review that compared EUS guided pseudocyst drainage with percutaneous and surgical alternatives showed that the complication rates were higher for surgical (28-34%, with 1-8.5% mortality) and percutaneous drainage (18%, with 2% mortality), compared to EUS-guided transmural drainage (1.5%, with 0% mortality) [2]. In the context of perforation, surgery would have to be considered very strongly. However, this case was complicated by two episodes of acute myocardial infarction, and hence was assessed to be a very high surgical risk. Less invasive alternatives had to be explored, including conservative management with no further interventions, percutaneous drainage and endoscopic drainage. Given the fact that progressively severe complications occurred, with initial bleeding followed by perforation, conservative management alone would clearly not be possible, since a potentially fatal free perforation could occur. Percutaneous drainage is at this point a very viable less invasive option. However, it does have its inherent risks. It necessitates an

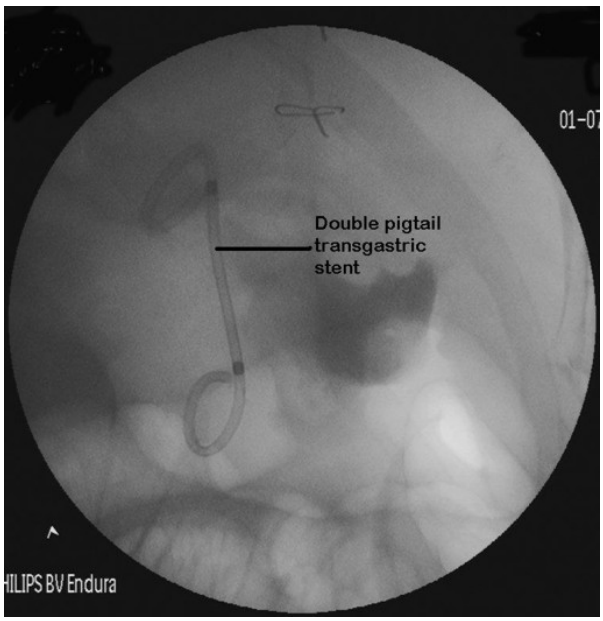

Figure 5. Radiological view of a double pigtail transgastric stent.

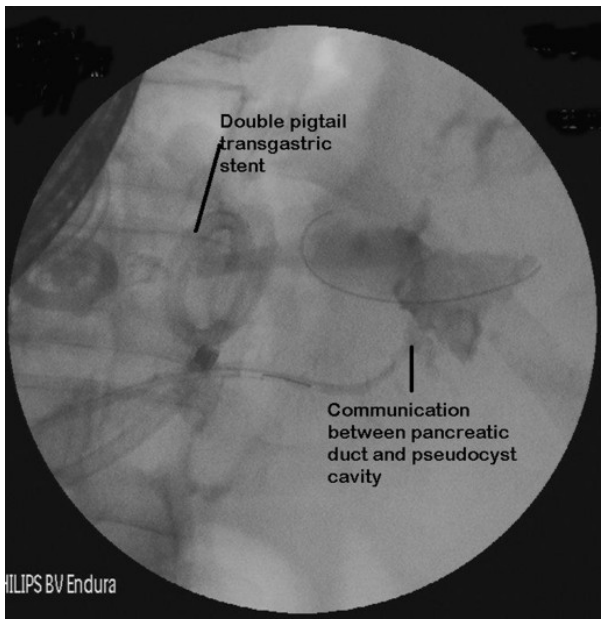

Figure 6. Presence of a communication between the pancreatic duct and the pseudocyst cavity.

external indwelling drainage catheter, and complications such as bleeding, inadvertent puncture of adjacent viscera, perforation and secondary infection may occur. A prolonged period of external drainage may be needed and a pancreatico-cutaneous fistula could occur [1].

After discussion of the management options the patient and his family members opted for EUS-guided endoscopic drainage. This has the advantages of close proximity and direct access to the pseudocyst cavity with no need to traverse other organs during the drainage procedure, the ability to perform drainage even in the absence of endoscopic bulging, and the potential to decrease the risk of bleeding by avoiding interposed blood vessels through the use of Doppler ultrasound. The problems of cutaneous infection and external fistulas are also avoided. However, performing endoscopy in a patient during an active acute myocardial infarction is fraught with potential risks [3]. The patient is at an increased risk for cardiopulmonary complications such as arrhythmia, worsening ischemia, hypotension and respiratory compromise and this has justifiably resulted in endoscopists being hesitant to perform endoscopic interventions. Currently there are no clear guidelines concerning when to perform endoscopy after an episode of acute myocardial infarction. It is common to wait for 4 to 6 weeks prior to performing an elective surgery [4], and this practice has frequently been adopted into clinical practice for endoscopy. On the other hand, there are data that support the utility and safety of therapeutic endoscopy in patients with acute myocardial infarction, especially in the context of upper gastrointestinal bleeding [5, 6]. Although frequently endoscopy is delayed to a week, it has also been safely performed at a shorter time frame. In a retrospective study that examined endoscopy performed within a time frame of up to 30 days after acute myocardial infarction, the overall cardiopulmonary complication rate was 1.48%. These complications occurred when endoscopy was performed within 24 hours of the acute myocardial infarction (11.8% when considering only endoscopies performed within 24 hours). On the other hand, no cardiopulmonary complications were observed during endoscopy after 24 hours [7].

No doubt this is only a single case report, and one cannot generalize its applicability to all cases. However, it does illustrate an important point. Within the constraints of a narrow therapeutic window, as illustrated in this case of a patient with contained perforation and acute myocardial infarction, successful EUS-guided pseudocyst drainage is possible. This treatment modality should be borne in mind and could be offered as a treatment option in selected cases of contained perforation or in the context of acute myocardial infarction, with a potential for lower morbidity in the intermediate and long term when compared to surgery and percutaneous drainage.

Conflict of interest None

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