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ABOUT COVER

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CASE REPORT

Massive gastric bleeding - perforation of pancreatic pseudocyst into the stomach: A case report and review of literature

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Abstract

BACKGROUND

Pancreatic pseudocyst may cause serious gastrointestinal complications including necrosis, infection, and perforation of the gastrointestinal tract wall, but massive gastric bleeding is very rare.

CASE

We report a rare case of a 49-year-old man with life-threatening gastric bleeding from a pseudoaneurysm of the splenic artery perforating the stomach induced by pancreatic pseudocyst. During hospitalization, gastroscopy revealed a bare blood vessel in an ulcer-like depression of the greater gastric curvature, and computed tomography scan confirmed a pancreatic pseudocyst invading part of the spleen and gastric wall of the greater curvature. Arteriography showed that the bare blood vessel originated from a pseudoaneurysm of the splenic artery. The bleeding was controlled by the trans-arterial embolization, the patient's recovery was rapid and uneventful.

CONCLUSION

Massive gastrointestinal bleeding could be a rare complication of pancreatic pseudo aneurysm.

Key Words: Gastric bleeding; Pseudoaneurysm of the arteria lienalis; Pancreatic pseudocyst; Trans-arterial embolization; Case report

Core Tip: Massive hemorrhage of the gastrointestinal tract is an infrequent complication

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of the pancreatic pseudocyst and pseudoaneurysm. We present herein, a novel case of a patient with life-threatening gastric bleeding from a pseudoaneurysm of the splenic artery as a complication of pancreatic pseudocyst perforating into the stomach, with trans-arterial embolization as a potential therapeutic modality for achieving hemostasis.

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INTRODUCTION

Erosion caused by the pancreatic inflammatory process or pseudocyst development in an adjacent vessel may lead to a pseudoaneurysm. Its rupture in the gastrointestinal tract can target the pancreatic duct, stomach, duodenum, or colon[1,2]. Massive hemorrhage of the gastrointestinal tract is an infrequent complication of pancreatic pseudocyst and pseudoaneurysm but can be lethal, with a reported death rate of approximately 50%[3,4]. Therefore, spontaneous rupture of a pancreatic pseudocyst into adjacent organs with massive bleeding from a pseudoaneurysm requires rapid management. Here, we report a novel case of a 49-year-old man with life-threatening gastric bleeding from a pseudoaneurysm of the splenic artery as a complication of pancreatic pseudocyst perforating into the stomach, with trans-arterial embolization (TAE) as a potential therapeutic modality for achieving hemostasis.

CASE PRESENTATION

Chief complaints

A 49-year-old male presented to the emergency room with pain in the left upper abdomen and melena, accompanied by symptoms of dizziness and weakness.

History of present illness

Patient had intermittent left upper abdomen pain and melena for 5 d.

History of past illness

He had a history of alcoholism and was diagnosed with pancreatitis and type 2 diabetes for 1 year.

Physical examination

On admission, physical examination revealed only slight tenderness in the left upper abdomen and pale conjunctiva of eye. No muscular tension or rebound tenderness was noted. Digital rectal examination showed negative results.

Laboratory examinations

Laboratory tests showed that hemoglobin was 63 g/L (normal range: > 120 g/L). The fecal occult blood result was positive, and the remaining biochemical tests including amylase were normal.

Imaging examinations

Gastroscopic examination revealed an ulcer-like depression on the upper part of the greater gastric curvature and mucus secretions adhered to the epithelial surface. The surrounding mucosa exhibited thickening and edema with obscured structural outlines. The gastric folds could not be fully extended after gas charging. We suspected that upper gastrointestinal bleeding was caused by a gastric ulcer or gastric cancer. The condition improved after proton pump inhibitors and octreotide pumping hemostasis treatment for 1 wk, but the patient suddenly excreted watery dark red stool again, accompanied by massive hematemesis. Gastroscopy was repeated, and

oozing blood was found in the ulcer-like depression of the gastric greater curvature previously observed, blood vessels were exposed after repeated rinsing (Figure 1). Computed tomography (CT) scan confirmed widespread subversion of pancreatic parenchyma, with evidence of multiple inhomogeneous hypodense and partially confluent cystic formations. The pancreatic pseudocyst invaded part of the spleen and greater curvature of the stomach; the invaded gastric mucosa was irregularly thickened and emitted an uneven signal (Figure 2). Emergency digital subtraction angiography (DSA) revealed that the pseudoaneurysm arose from the splenic artery (Figure 3).

FINAL DIAGNOSIS

Finally, the patient was diagnosed with upper gastrointestinal bleeding from a pseudo aneurysm of the arteria lienalis secondary to perforated pancreatic pseudoaneurysm invading into the stomach.

TREATMENT

The patient underwent surgical treatment with TAE (coil embolization) of the splenic artery, which was successfully performed and the bleeding was effectively controlled (Figure 4).

OUTCOME AND FOLLOW-UP

One week after the operation, the patient's recovery was rapid and uneventful.

DISCUSSION

The incidence of pancreatic pseudocyst associated with hemorrhage is approximately 5%-10%, with a mortality rate of about 50%[3,4]. The clinical feature varies depending on the location and severity of the bleeding, thus presenting in different forms, from abdominal pain to hypovolemic shock[5,6]. Massive bleeding has been reported in 2%-10% of patients with pancreatitis and occurs as upper or lower gastrointestinal tract bleeding[7,8]. The rapid development of an abdominal painful mass suggests intracystic bleeding. Intraperitoneal bleeding causes abdominal distension and hemorrhagic shock.

The main pathogenesis involves erosion of the pancreas, peripancreatic vessels, and surrounding tissues because of elastase and trypsin, which weaken tensile strength and cause rupture or bleeding after pseudoaneurysm formation. The splenic artery is the most frequently involved site of pancreatitis complicated with pseudoaneurysm[9]. Other sites include the gastroduodenal artery, the pancreaticoduodenal artery, and the hepatic artery. We conducted a review of published case reports. These reports described patients with pancreatic pseudoaneurysms that communicated with the bowel lumen in the past 5 years (Table 1)[10-26]. When the cyst invades the gastrointestinal tract, bleeding can appear in the abdomen, stomach, duodenum and even the lower digestive tract, presenting as massive bloody stool and hematemesis or chronic intermittent bleeding after abdominal pain[27,28]. Regarding hemorrhage of the digestive tract or abdominal cavity in pancreatitis, localization of the bleeding in a timely and accurate manner is very important. CT and B-ultrasound are the first choices for imaging evaluation of pancreatitis. These methods clarify the severity and extent of pancreatitis to determine whether the condition is associated with pancreatic abscess or pseudoaneurysms, and accurately assess the condition of peripancreatic vessels[29,30]. Computed-tomography angiography (CTA) can improve the diagnostic positive rate during the bleeding period. CTA can demonstrate the full extent of a pseudoaneurysm, in case of partial thrombosis, and its effect on the adjacent viscera. But CTA has the disadvantage of radiation exposure, which is particularly critical in young patients[31]. DSA is the gold standard for the diagnosis of hemorrhage of pancreatic pseudoaneurysms, contrast agent extravasation can be found when the bleeding is greater than 0.5 mL/min, which is important for the diagnosis of

Table 1 Summary of case reports in the literature of gastrointestinal bleeding from pancreatic pseudoaneurysm

Ref.	Age in yr	Sex	Involved hollow viscus and bleeding part	Treatment
Fujio *et al*[10], 2017	75	Male	Jejunum	TAE
Eftimie *et al*[11], 2017	55	Male	Colon	Surgery
	59	Male	Stomach	Surgery
Budzyński *et al*[12], 2016	42	Female	Stomach	TAE
O'Brien *et al*[13], 2016	88	Female	Colon	TAE
Zhang *et al*[14], 2016	58	Female	Stomach	TAE
Zhao *et al*[15], 2014	64	Male	Colon	Surgery
Razik *et al*[16], 2016	62	Female	Duodenum	TAE
Hoshimoto *et al*[17], 2016	61	Male	Stomach	TAE
Larrey Ruiz *et al*[18], 2016	40	Male	Duodenum	TAE and Surgery
Chia *et al*[19], 2015	24	Male	Stomach	Surgery
Sawicki *et al*[20], 2015	57	Male	Stomach and abdominal cavity	Surgery
Ferreira *et al*[21], 2015	54	Male	Duodenum	TAE
Shah *et al*[22], 2015	69	Male	Duodenum	TAE
Maddah *et al*[23], 2015	32	Female	Stomach	Surgery
	54	Male	Stomach	Surgery
Peynircioğlu *et al*[24], 2015	62	Male	Duodenum	TAE
Mandaliya *et al*[25], 2014	61	Female	Duodenum	TAE
Herrera-Fernández *et al*[26], 2014	34	Female	Stomach	Surgery

TAE: Trans-arterial embolization.

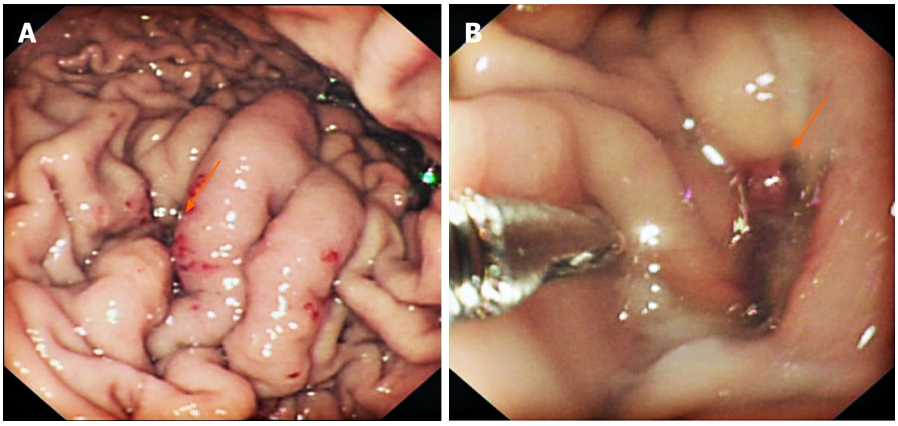

Figure 1 Gastroscopy images. A: The first gastroscopy showed an ulcer-like depression of the gastric greater curvature (orange arrow); B: The second gastroscopy showed exposed blood vessels in the ulcer-like depression of the greater curvature (orange arrow).

hemorrhage position. We compared three therapeutic modalities (Table 2).

In such cases, effective therapeutic procedures include percutaneous, intravascular embolization (TAE), or immediate laparotomy[28], laparotomy during hemorrhagic shock can give rise to serious complications. Endovascular treatment has several advantages compared to open surgical repair, allowing accurate localization of pseudoaneurysm and assessment of collateral vessels; it is associated with a lower post-operative morbidity and mortality (4%-19%) compared to surgery and a high rate of technical success (67%-97%)[32]. Moreover, if rebleeding occurs, the procedure can be promptly repeated. Therefore, for patients who are at risk for massive bleeding, accompanied with unstable vital signs, selectively DSA examination should be

Table 2 Advantages and disadvantages of therapeutic options

Therapeutic options	Advantages	Disadvantages
Endoscopic	Minimally invasive, accurate localization, rapid, safe, high success rate, few complications, and rapid recovery	Limited for operating site, rebleeding
Endovascular	Minimally invasive, accurate localization, rapid, safe, high success rate, few complications, and rapid recovery	Radiation exposure, rebleeding
Surgical	Selection after endoscopy and endovascular are ineffective in the treatment of gastrointestinal bleeding	Massive trauma, many complications, slow recovery

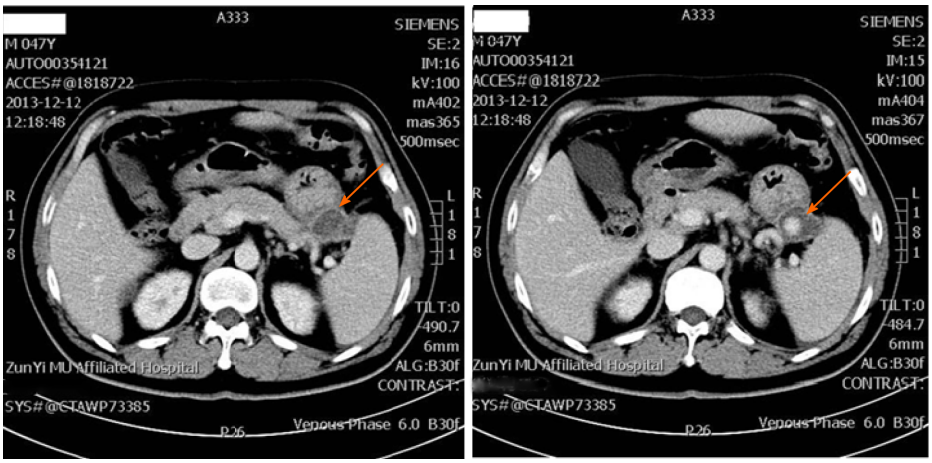

Figure 2 Computed tomography images confirmed that the pancreatic pseudocyst invaded part of the spleen and greater curvature of the stomach.

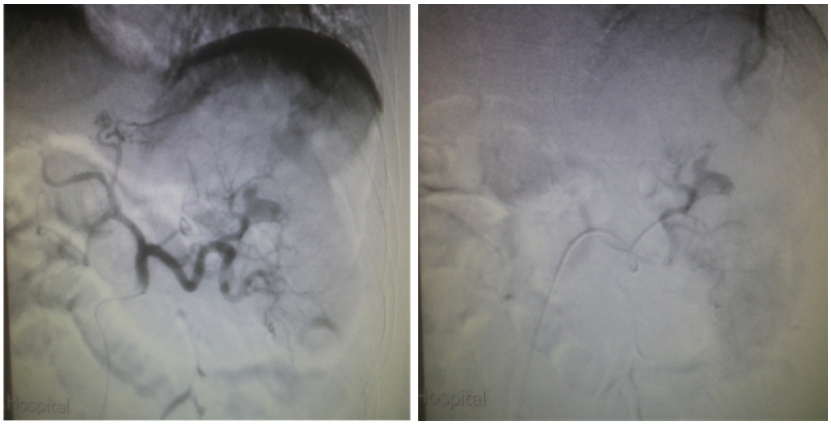

Figure 3 Angiography found a pseudoaneurysm of the splenic artery.

performed immediately to identify the bleeding location, and TAE is likely to be the first choice for temporary control of bleeding. Supplementary endovascular options include use of liquid embolic agents, temporary embolic materials (Gelfoam slurry; Upjohn Co., Kalamazoo, MI, United States) or coil embolization[33]. Many endovascular treatment options are today available mainly depending on expendability of parent artery and size of pseudoaneurysmal neck. Parent artery is expendable when adequate extensive collateral circulation is present; in this case aggressive coil embolization can be performed. Coil embolization of expendable arteries is preferable distally and proximally to the site of extravasation (the so called "sandwich" technique), thereby preventing backflow from the collateral circulation[34,35]. Rebleeding has been reported in 37% of patients, and urgent surgery should be limited to when embolization fails. Even after successful immediate embolization[28], the safety and success rate of TAE treatment for the pseudoaneurysm hemorrhage need to be improved in the future.

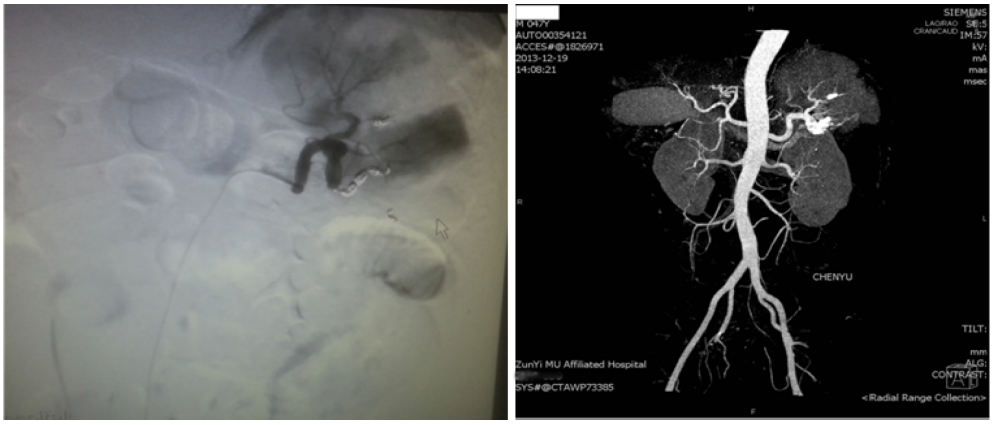

Figure 4 Trans-arterial embolization (coil embolization) of the splenic artery was successfully performed.

CONCLUSION

Gastrointestinal bleeding is a relatively rare but potentially lethal complication of pancreatic pseudoaneurysms. Endovascular treatment should always be considered the first-line option for the management of peripancreatic pseudoaneurysm in patients who are at risk of massive bleeding, accompanied by unstable vital signs.

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