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CASE REPORT

Successful resolution of gastric perforation caused by a severe complication of pancreatic walled-off necrosis: A case report

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Abstract

BACKGROUND

Pancreatic walled-off necrosis (WON) rarely causes critical gastric necrosis and perforation, which may develop when pancreatic WON squashes against the stomach. The Atlanta 2012 guidelines were introduced for acute pancreatitis and its related clinical entities. However, there are few reported cases describing the clinical course and resolution of pancreatic WON.

CASE SUMMARY

We report the case of a 45-year-old man who presented to the urgent emergency department with gastric perforation caused by a severe complication of pancreatic WON on computed tomography. The patient underwent an emergency distal pancreatectomy, splenectomy, and gastric wedge resection. Postoperative findings showed re-perforation of the gastric wall at a previously resected margin. Furthermore, endoscopic examination revealed an ulcerative area with a defect in the fundus. After diagnostic endoscopy, endoscopic vacuum-assisted closure was performed, and continuous suction was transferred over all tissues in contact with the sponge surface. The patient recovered without any further complications and was discharged in good condition at postoperative week 8. No recurrence occurred during the 6-mo follow-up period.

CONCLUSION

When managing a patient with serious gastric perforation complicated by pancreatic WON, a multidisciplinary treatment approach should be considered.

Key Words: Acute necrotizing pancreatitis; Endoscopy; Vacuum assisted closure; Gastric rupture; Surgery; Case report

Core Tip: Pancreatic walled-off necrosis (WON) rarely causes critical gastric necrosis and perforation. Cases of successful resolution of gastric perforation complicated by pancreatic WON are hardly encountered. Due to their rarity, discussing each clinical experience is necessary.

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INTRODUCTION

Pancreatic walled-off necrosis (WON) developing in the course of necrotizing pancreatitis occurs 4 or more weeks after its onset[1]. Although systemic inflammation commonly wanes 14 d after the onset of symptoms, infected necrosis progresses in approximately 30% of patients with necrotizing pancreatitis[2]. Gastric complication related to pancreatic WON is a rare complication of acute pancreatitis. To date, cases of gastric perforation, a serious complication of pancreatic WON, are hardly encountered and similar cases to ours are few[3-5]. Successful resolution in cases of gastric perforation complicated by pancreatic WON is hardly seen. Due to their rarity, discussing each clinical experience is necessary. Moreover, we are eager that clinicians will gain a better understanding of the clinical course of gastric complications related to WON.

CASE PRESENTATION

Chief complaints

A 45-year-old man, drinking at least 3 times a week for 3 mo due to social and personal issues, presented with abdominal pain for 21 d.

History of present illness

The patient reported no present illness.

History of past illness

The patient reported no past illness.

Personal and family history

The patient reported no relevant medical or family history.

Physical examination

Upon presentation, the patient's vital signs were stable. However, he showed paleness. Physical examination revealed signs of peritoneal irrigation such as a distended abdomen with rigidity and tenderness in the epigastric region.

Laboratory examinations

Table 1 reveals biochemistry values upon admission.

Imaging examinations

Contrast-enhanced computed tomography (CT) showed, adjacent to the huge WON, wall defect, demonstrating a perforation in the stomach fundus and splenic infarction. Contrast-enhanced CT scanning demonstrated the huge WON at the intra- and extrapancreatic areas (Figure 1A and B).

Table 1 Biochemistry values upon admission

Value	Unit	Reference range	On admission
White blood cell count	10^9/uL	3.8-11.0	12.78
Neutrophil count	10^9/uL	1.5-7.0	9.25
Hemoglobin	g/dL	13.5-17.5	8.40
Hematocrit	%	39.0-53.0	25.00
Platelet count	10^9/uL	140-420	697.00
C-reactive protein	mg/dL	0-0.5	9.24
Lactate dehydrogenase	U/L	135-225	274.00
Lactic acid	mmol/L	0.7-2.5	2.20
Sodium	mmol/L	138-148	119.00
Potassium	mmol/L	3.5-5.3	3.69
Serum amylase	U/L	36-128	29.30
Serum lipase	U/L	22-51	80.10

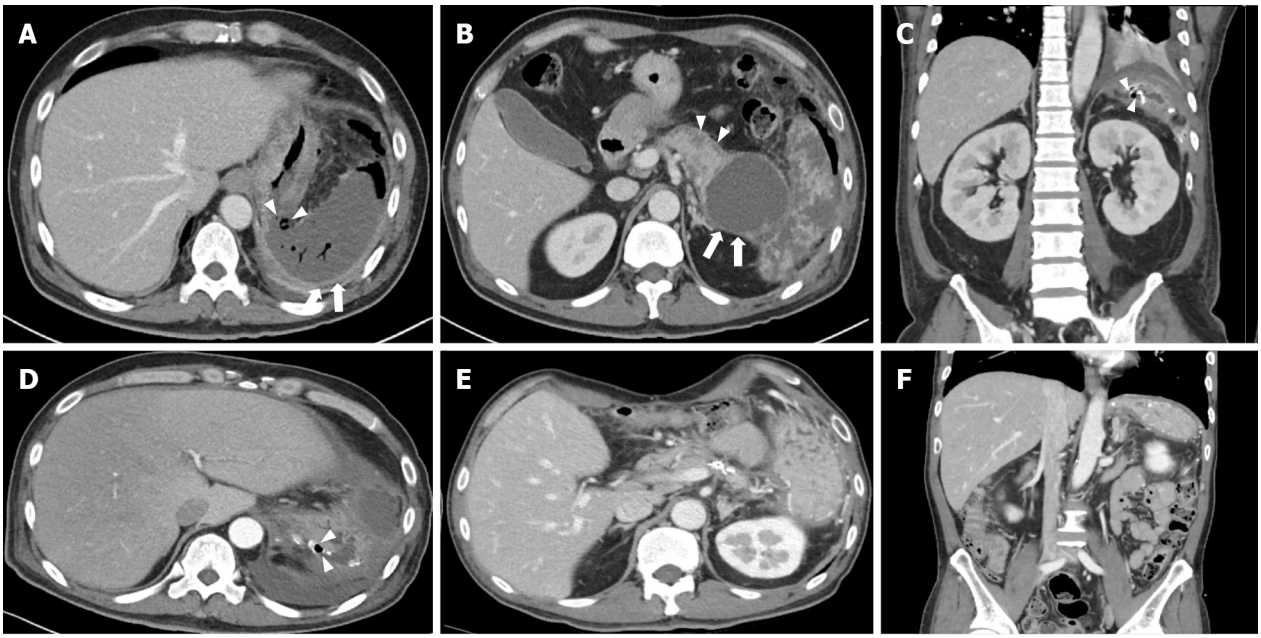

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Figure 1 Abdominal contrast-enhanced computed tomography images in a 45-year-old man. A: Adjacent to the huge walled-off necrosis, there is a wall defect, demonstrating perforation of the stomach fundus (arrowheads) and splenic infarction (white arrow); B: Contrast-enhanced computed tomography (CT) scanning demonstrated the huge walled-off necrosis at the intra- (arrowheads) and extrapancreatic areas (white arrows); C: Axial view of contrast-enhanced CT image; D: Coronary view of portal venous phase CT on postoperative day 18 shows significant wall defect on previous staple line (arrowheads); E and F: Axial and coronary views of portal venous phase CT at the 3-mo follow-up. CT images show improved process of loculated fluid collection with air bubble at pancreatic bed and left subphrenic space.

FINAL DIAGNOSIS

Based on the preoperative CT and histopathology results, the final diagnosis was gastric perforation caused by a severe complication of pancreatic WON.

TREATMENT

Ceftriaxone and metronidazole were initially administered. After identifying the organisms, piperacillin-tazobactam, fluconazole, and vancomycin were administered after consultation with infectious disease specialists. Postoperative

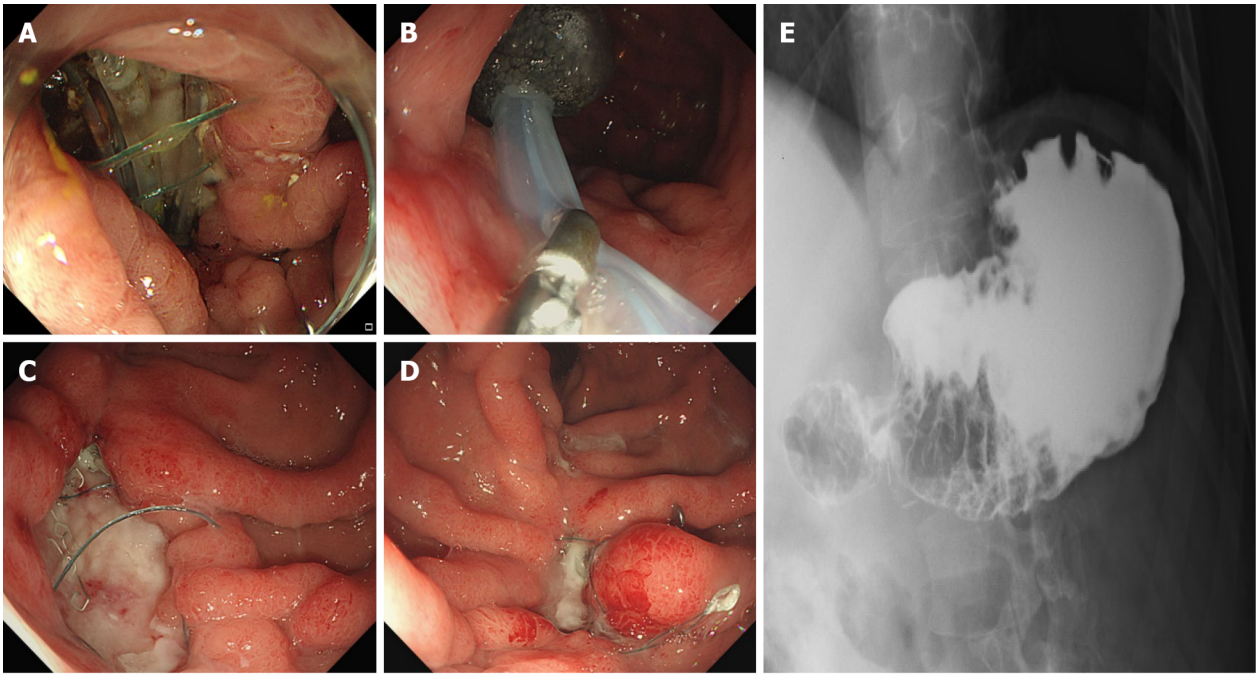

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Figure 2 Treatment. A: 45-year-old man is diagnosed with a 3-cm gastric perforation at the anastomosis site on postoperative day 18; B: A polyurethane sponge is inserted into the cavity of the anastomotic leak with nasogastric continuous suction; C: The perforation site is downsized with granulation tissue during the fourth endoscopic vacuum-assisted closure (EVAC); D: The cavity is closed after seven EVAC procedures; E: Follow-up upper gastrointestinal radiography shows no contrast leakage from the stomach.

serum amylase and lipase levels were within the normal range. Drain fluid amylase was 1052 U/L at postoperative day (POD) 1 and 17.6 U/L at POD 7. After necrosectomy, the patient received supportive medical treatment, including parenteral nutrition and diet, starting on POD 7. Thereafter, the patient suddenly experienced unsuspected abdominal discomfort at POD 18. Follow-up CT (Figure 1C and D) and endoscopy revealed a 3-cm gastric perforation at the anastomotic site (Figure 2A). Reoperation was not an option due to severe inflammation. Based on discussions with gastroenterologists, endoscopic vacuum-assisted closure (EVAC) was performed, and continuous suction was applied to the perforated site through a nasogastric drainage tube with a polyurethane sponge (KCI Inc., San Antonio, TX, United States) (Figure 2B). Surgical drain was removed due to maintaining a negative pressure on sponge. Drain fluid amylase level was 3.0 U/L and had an output of < 20 mL. EVAC treatment was continued for 3 wk with sponge exchange every 72 h until the wound cavity had healed (Figure 2C and D). Follow-up upper gastrointestinal series showed no contrast leakage from the stomach (Figure 2E). The patient was discharged in good condition at postoperative week 8.

OUTCOME AND FOLLOW-UP

At the 3-mo follow-up, CT showed significant improvement (Figure 1E and F). The patient was followed up as an outpatient for 6 mo without showing recurrence or readmission event including glucose control, and is doing well at work after getting a job.

DISCUSSION

The Atlanta Symposium (2012) introduced guidelines to globalize the definitions of acute pancreatitis and related clinical entities[6]. Of all the entities, necrotizing pancreatitis most commonly manifests as necrosis involving both the pancreatic and peripancreatic tissues[7]. Pancreatic necrosis constitutes substantial additional morbidity, with mortality rates as high as 20%-30%[8]. Surgical volumes of interventions have significantly decreased over the years, as minimally invasive strategies have proven effective[9]. However, emergency surgery, irrespective of time, is indicated for cases of gastrointestinal perforation caused by necrotizing pancreatitis[10]. Pancreatic WON is a mature, encapsulated, acute necrotic collection with a well-defined inflammatory wall observed on contrast-enhanced CT. Our patient showed a heterogeneous, fully encapsulated collection with small air pockets inside the cyst and near the peritoneal space. Conventional management of infected WON depends on the availability of expertise and severity of the comorbid medical status. Endoscopic drainage is a commonly used procedure in patients without gastrointestinal perforation. However, there is a high complication rate and longer hospital stay associated with drainage procedures[11]. From the point of view of

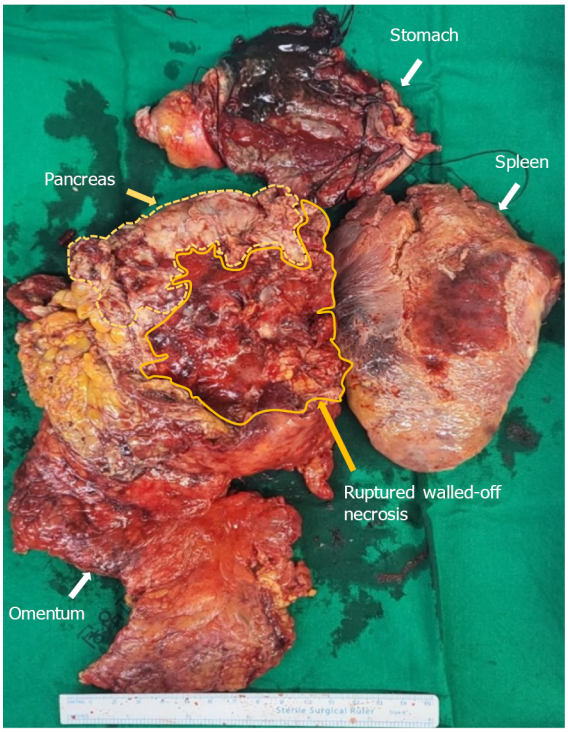

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Figure 3 Surgical specimen after distal pancreatectomy, splenectomy, and gastric wedge resection. Note that the pancreatic walled-off necrosis is ruptured during operation. Each specimen is resected separately.

surgical management of necrotizing pancreatitis, a previous report has emphasized that formal resection should be avoided to lower the event of bleeding and fistula formation and protect normal tissue. Thus, repeated debridements with continuous drainage were commonly performed. However, those procedures could be usually associated with immediate and long-term complications such as gastrointestinal perforation, infection, organ failure, and fistula. Morbidity rates of 34%-95% have been reported[7,9]. In our case, we initially performed formal distal pancreatectomy and adjacent necrotic tissue resection with surgical drainage (Figure 3). Cholecystectomy was not performed because there was no evidence of gallstone pancreatitis. Regarding gastric perforation with pancreatic WON, there are no surgical guidelines due to the rarity of this disease entity. We suggest that formal resection would be a better procedure for removing necrotic tissue as much as possible without further surgical debridement. Reperforation occurred during postoperative care with proper conservative care, including nutritional support and antibacterial therapy with antifungal agents. In terms of complications, suitable treatment in patients with gastric perforation requires collaboration among surgeons, radiologists, and gastroenterologists. Endoscopic closure techniques are promising alternatives to surgical treatment[12]. A retrospective study including 71 patients compared stent placement with EVAC for nonsurgical closure of intrathoracic leakage. The overall closure rate was higher in the EVAC group (84.4%) than in the stent group (53.8%). EVAC appears to be an effective alternative to other methods for treating anastomotic leaks[13]. After diagnostic endoscopy, the sponge was placed at the leakage site and released using a pusher. Our patient changed sponges seven times over 3 wk. After successful resolution, the patient was initiated on an oral diet without complications. Clinical cases showing resolution of pancreatic WON with gastric perforation is hardly reported. Therefore, discussing multidisciplinary clinical approaches is essential.

CONCLUSION

Encountering a patient with serious gastric perforation complicated by pancreatic WON, formal distal pancreatectomy, adjacent necrotic tissue resection, and surgical drainage with a multidisciplinary treatment approach could be considerable options for improving the therapeutic outcome.

FOOTNOTES

Author contributions: Noh BG, Yoon M, Park YM, Seo HI, Kim S, Hong SB, Park JK, and Lee MW contributed to the acquisition of data for this study; Noh BG analyzed the data and wrote the manuscript; Yoon Mh designed the case report; and all authors have read and approved the final manuscript.

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