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Successful Resolution of Gastric Perforation Caused by a Severe Complication of Pancreatic Walled-Off Necrosis: A Case Report

Resolution of pancreatic Walled-Off Necrosis

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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 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 (EVAC) 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-month follow-up period.

CONCLUSION

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

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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.

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 days after the onset of symptoms, infected necrosis progresses in approximately 30 percent 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 days.

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, the patient 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. 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).

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 (PIP/TAZ), fluconazole, and vancomycin were administered after consultation with infectious disease specialists. Postoperative serum amylase and lipase levels were within 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 3A). 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, USA) (Figure 3B). 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 3C and D). Follow up upper gastrointestinal series showed no contrast leakage from the stomach (Figure 3E). The patient was discharged in good condition at postoperative week 8.

OUTCOME AND FOLLOW-UP

At the 3-month follow-up, CT showed significant improvement (Figure 1E and F). He 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 (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 reduced 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 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, it has a high complication rate and longer hospital stay associated with drainage procedures. [11] From the point of view of 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. 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 shortness of this disease entity and its rarity. We suggest that formal resection would be the 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 that 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 patients 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.

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Figure Legends

Figure 1 Abdominal contrast-enhanced computed tomography (CT) 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 CT scanning demonstrated the huge walled-off necrosis at the intra (arrowheads) and extrapancreatic areas (white arrow). C: Axial view of contrast-enhanced CT image and 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 view of portal venous phase CT at the 3-month follow-up. CT images showed improved process of loculated fluid collection with air bubble at pancreatic bed and left subphrenic space.

Figure 2 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.

Figure 3 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.

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3	Gang Xiao, Tao Xia, Yi-Ping Mou, Yu-Cheng Zhou. "Reoperation for heterochronic intraductal papillary mucinous neoplasm of the pancreas after bile duct neoplasm resection: A case report", World Journal of Gastrointestinal Surgery, 2023 Crossref	27 words — 2%

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