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Case Report

Necrotizing acute pancreatitis with gastric wall necrosis and biliopancreatic fistula: a case report

Mariana S. Duque[1]*, Mariana G. Lemos[1,2], Nuno P. Almeida[2,3], António S. Bernardes[1,2], José G. Tralhão[1,2]

[1]Department of General Surgery, ULS de Coimbra, Coimbra, Portugal
[2]Faculty of Medicine, University of Coimbra, Coimbra, Portugal
[3]Department of Gastroenterology, ULS de Coimbra, Coimbra, Portugal

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***Correspondence:**
Dr. Mariana S. Duque,
E-mail: mariana.duque25@gmail.com

ABSTRACT

Chronic pancreatitis (CP) is a condition characterized by chronic inflammation of the pancreatic gland. This multifactorial condition might be associated with different clinical manifestations but patients may also experience acute exacerbations. In rare cases, these acute episodes can lead to serious, life-threatening complications requiring surgery. Gastric wall necrosis is a rare complication of severe acute pancreatitis (AP) requiring a rapid specialized approach. Biliopancreatic fistula can also arise in this context, particularly in acute necrotizing pancreatitis. Both biliopancreatic fistula and gastric necrosis can determine serious management challenges, particularly regarding the surgical approach. We present the case of a male patient in his late fifties with history of alcohol-related CP. This patient experienced a new episode of acute necrotizing pancreatitis after several years of being clinically stable and asymptomatic. Initial management was performed in another centre. This included damage control surgery, due to gastric wall necrosis, with gastric partial resection without anastomosis and the patient was subsequently transferred to our center to continue treatment and restoration of esophagogastric continuity. In the second and final surgical approach, 10 weeks after the index surgery, esophagogastric anastomosis was performed and a biliopancreatic fistula was intra-operatively identified and managed with endoscopic retrograde cholangiopancreatography (ERCP) through the gastric stump with placement of a plastic biliary stent bypassing the fistula. Association of acute gastric wall necrosis and biliopancreatic fistula is a rare and challenging complication of AP. Although definitive treatment may need to be delayed to a secondary surgery, this case highlights the potential for successful management in specialized centres with an experienced biliopancreatic team.

Keywords: Acute necrotizing pancreatitis, Gastrectomy, Necrosis, Biliary fistula, Endoscopic Retrograde cholangiopancreatography

INTRODUCTION

Chronic pancreatitis (CP) is a complex pathological condition characterized by chronic inflammation of the pancreatic gland, with parenchymal fibrosis and atrophy.[1] As a result, patients with CP might suffer from chronic abdominal pain, endocrine and exocrine pancreatic dysfunction, pseudocysts, ascites, pleural effusion, pancreatic fistula and venous thrombosis requiring complex multidisciplinary approach.[2,3]

Anatomic changes related to CP include pseudocyst formation which might become symptomatic throughout the patient's lifetime.[4] Management of pancreatic fluid collections might be challenging, requiring complex endoscopic, requiring complex approaches, surgical, endoscopic or percutaneous.[5]

Patients with CP can also experience AP episodes, sometimes with severe complications. Initial management of AP includes fluid resuscitation, early enteral nutrition[6] and pain management.[7]

Gastric necrosis is a known, yet rare, complication of AP requiring partial or total gastrectomy.[8,9] However, fearsome complications may arise from this procedure, including anastomotic dehiscence or intra-abdominal collections. In this setting, a damage-control approach-leaving the oesophageal and gastric stumps closed-may be the correct temporary measure, although reoperation to re-establish esophagogastric continuity is a challenging procedure.

On the other side, the development of a biliopancreatic fistula in the setting of AP is typically a consequence of necrotizing pancreatitis. It can result from necrosis and erosion through the pancreatic and biliary duct walls, from pseudocyst-biliary communication when the pseudocyst erodes into the adjacent common bile duct or gallbladder, or from infected necrosis.[10]

The simultaneous occurrence of these severe complications is rather rare and must be managed in a multidisciplinary approach.

We present a case that illustrates the successful, albeit complex, staged surgical and endoscopic management of both gastric necrosis and a biliopancreatic fistula following acute necrotizing pancreatitis.

CASE REPORT

We present the case of a male in his late fifties with a known history of CP with endocrine and exocrine pancreatic dysfunction. He had experienced an episode of acute necrotizing pancreatitis 8 years prior with multiorgan failure (MOF), presumably alcoholic. Follow-up has documented pseudocysts, the largest one with nine cm diameter, with no signs of the infectious complications.

This patient presented to the hospital in another country with sudden severe abdominal pain, being diagnosed with an acute necrotizing pancreatitis once more, with MOF. During the diagnostic workup, abdominal computed tomography (CT) revealed the proximal gastric wall necrosis.

As the patient was critically-ill, he underwent damage-control surgery with proximal hemi-gastrectomy and splenectomy. Considering the intense local inflammatory environment and absence of clinical stability, the surgical team decided against doing the esophagogastric anastomosis, leaving the esophageal and gastric stumps closed. The patient was then admitted in the intensive care unit (ICU). Postoperative period was complicated with multi-organ dysfunction syndrome and a left subphrenic abscess, which was drained percutaneously.

One month after the index surgery, the patient was transferred to our centre to continue treatment. Esophagogastric tract continuity was not restored at time of transfer.

He presented with no abdominal or thoracic complaints, nourished through a central venous access with total parenteral nutrition. He had a percutaneous abdominal pig-tail drain on the left hypochondrium and a naso-esophageal tube.

After admission at our institution, baseline assessment included blood work and abdominal CT. Blood tests were unremarkable, and the CT revealed a 10 cm left subphrenic abscess with a pigtail catheter placed within the collection (Figure 1). Another peri-pancreatic abscess was also identified with 3 cm diameter.

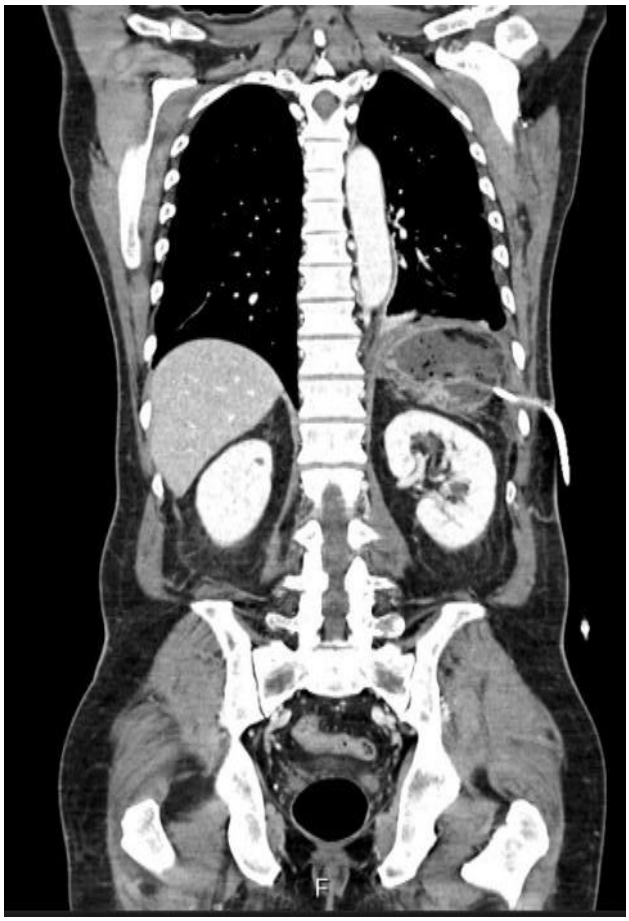

Figure 1: Intra-abdominal left subphrenic abscess with pig-tail drain.

Fistulogram through the pig-tail drain revealed opacity of the largest abscess with no gastrointestinal tract opacification (Figure 2), excluding gastric stump fistula. Magnetic resonance cholangiopancreatography (MRCP) findings were suggestive of a fistulous communication between the main pancreatic duct and the larger peripancreatic collection in the tail region (Figure 3) and revealed a slight dilation of the main biliary duct (7 mm).

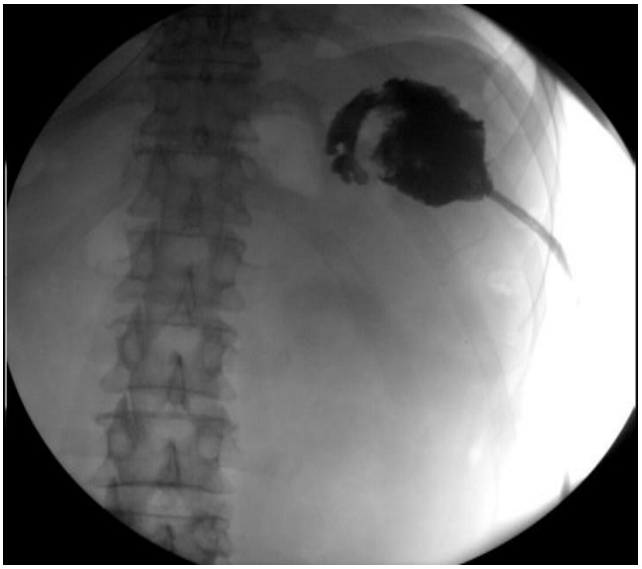

Figure 2: Fistulogram through the drain - opacity of the abscess with no gastrointestinal tract opacification.

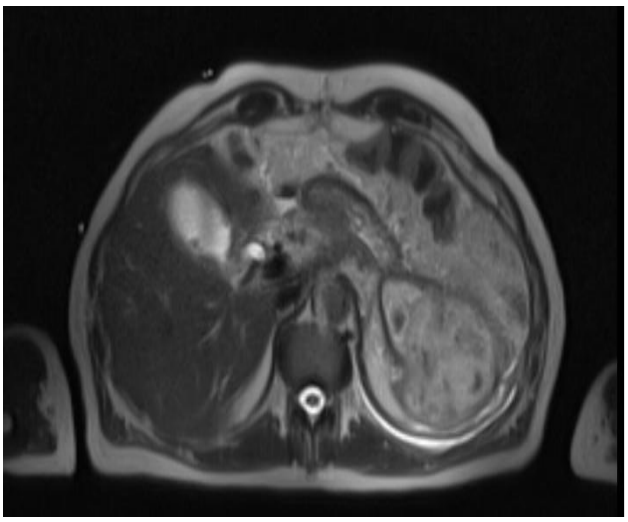

Figure 3: MRCP showing a large, encapsulated fluid collection (abscess) in the left hypochondrium, adjacent to the pancreatic tail.

The patient received a six week course of parenteral nutrition and rehabilitation program in our institution. He also received antibiotic treatment, with an eight-day course of intravenous Piperacillin/Tazobactam and Metronidazole. A second surgery was performed 10 weeks after the initial damage-control procedure (six weeks after transfer to our institution).

Laparotomy revealed intense adhesive peritonitis (Figure 4) and a left subphrenic abscess. Esophageal and gastric stumps identification was particularly challenging due to the intense inflammatory process within the left hypochondrium. A 32-Fr “Fouchet” esophageal tube insertion helped identify the esophageal stump, which was then referenced.

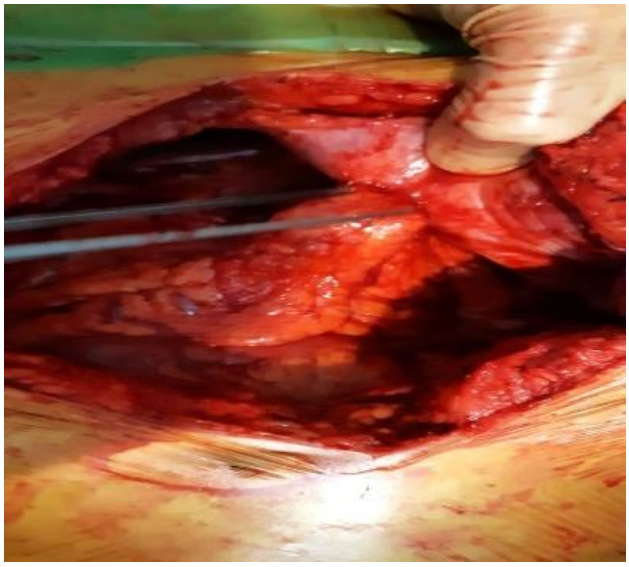

Figure 4: Intense adhesive peritonitis after median laparotomy.

The intra-abdominal abscess was drained, followed by irrigation of the cavity with normal saline solution. After gastric stump identification and mobilization, a biliopancreatic fistula was detected in the anterior side of the pancreatic head, probably related to a communication with the smaller peripancreatic collection. ERCP was performed through the surgically opened gastric stump (Figure 5), and cholangiography confirmed the presence of a biliary leak (Figure 6). Following biliary sphincterotomy, a plastic biliary stent was placed in the common bile duct. Selective catheterization of the pancreatic duct was unsuccessful, presumably due to ductal stenosis. Finally, gastrointestinal continuity was re-established via a mechanical end-to-side circular esophagogastrostomy using a 25-mm stapling device.

Figure 5: ERCP was performed through the opened gastric stump.

Figure 6: Intraoperative cholangiogram via ERCP showing contrast extravasation from the common bile duct (arrow), confirming the presence of a biliary leak composing the biliopancreatic fistula.

The postoperative course was uneventful, with no major complications. A pancreatic fistula was detected in the abdominal drain output and was managed conservatively through periodic irrigation of the drain with small volumes of normal saline. Oral intake was resumed with a liquid diet on postoperative day 8. The patient was discharged on postoperative day 23, tolerating a soft food diet. The abdominal drain was removed at 6 weeks, and the biliary stent was removed via ERCP 8 weeks after surgery. At 4.5 years of follow-up, the patient remained asymptomatic except for occasional gastroesophageal reflux.

DISCUSSION

We present a complex case of multimodal management of two rare AP complications.

Approximately 20% of patients with AP suffer gross necrosis of the pancreatic parenchyma.[11] Gastric wall necrosis is a rare, yet possible, complication in this setting. As previously described in literature, this may be related to obstruction of small gastric vessels affecting microcirculation.[9,12] Pancreatitis related hypovolemia causing poor tissue perfusion, as well as enzymatic tissue destruction, have also been suggested as possible pathological mechanisms leading to gastric wall hypoperfusion and subsequent destruction.[13]

Erosion of surrounding structures due to the intense inflammatory process and enzymatic leak in AP may also be responsible for other local complications such as upper gastrointestinal bleeding or biliary complications, including biliopancreatic fistula formation.[14]

Damage control surgery may present as the only lifesaving option in cases of gastric wall necrosis, postponing non-essential procedures (esophagogastric anastomosis) to second-stage interventions. This is the reason why the first surgical team decided not to perform a primary anastomosis. Confronted with such an hostile environment, the surgeons opted for initial damage-control surgery, planning for later stabilization and reoperation when deemed feasible.

With this staged approach, local control of septic process and full recovery of pancreatitis-induced organ failure was possible before re-intervention. Nutritional and physical rehabilitation was also a priority before gastrojejunal anastomosis. We believe this timely but cautious approach was key to favourable outcome of this case.

On the other hand, this waiting period was also useful to further plan the next approach. Preoperative planning with CT, MRCP and fistulogram were useful to anticipate challenges and provide adequate resources in patient management. MRCP is an excellent diagnostic imaging modality to document local complications and to obtain anatomical detailing the area in the preoperative setting.[15]

A significant challenge in this case was the unexpected intraoperative discovery of a biliopancreatic fistula. ERCP proved to be a powerful tool in this specific circumstance as a minimally invasive approach to a complex biliary complication.[16] The unexpected finding of a biliopancreatic fistula intra-operatively could have been a major setback in this patient's surgical management. On-site management of the fistula with plastic biliary stent was crucial and only possible due to the multidisciplinary collaboration with Gastroenterologists and Radiologists. This approach likely prevented the need for future interventions, such as ERCP or percutaneous biliary procedures, to manage the biliary fistula that would be very difficult since the patient would have an altered surgical anatomy. Endoscopic or percutaneous management of biliary fistulas often requires multiple trials, costly material and several readmissions to the hospital.[17]

CONCLUSION

We consider that complex cases like the one presented must be approached on highly differentiated centres with broad range of healthcare services, including a trained biliopancreatic team, with general surgeons, gastroenterologists and interventional radiologists.

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