

A Case of Spontaneous Intraperitoneal Rupture of an Acute Necrotic Fluid Collection Associated with Necrotizing Pancreatitis

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Patient: **Male, 61**
Final Diagnosis: **Intraperitoneal rupture of acute necrotic peri-pancreatic fluid collection**
Symptoms: **Abdominal and/or epigastric pain • abdominal distension • hypotension • shock**
Medication: —
Clinical Procedure: **Exploratory laparotomy with external pancreatic drainage • exploratory laparotomy, cholecystectomy, cystgastrostomy**
Specialty: **Surgery**





Objective: **Rare co-existence of disease or pathology**
Background: An acute necrotic fluid collection is a rare condition that occurs within four weeks of the onset of necrotizing pancreatitis. This report is of a case of spontaneous intraperitoneal rupture of an acute necrotic fluid collection that required emergency laparotomy.

Case Report: A 61-year-old man presented with worsening symptoms following hospital discharge for necrotizing pancreatitis. On hospital admission, a computed tomography (CT) scan showed changes of pancreatic necrosis and inflammation with a peripancreatic fluid collection. On the sixth day following admission, he developed hemodynamic instability and peritonitis. Repeat CT scan showed a reduction in the size of the peripancreatic collection but free intraperitoneal fluid, consistent with intraperitoneal rupture. At exploratory laparotomy, several liters of necrotic pancreatic fluid were drained from the abdomen, followed by admission to the intensive care unit (ICU) for continued resuscitation. On postoperative day 3, he underwent open cystgastrostomy, cholecystectomy, placement of a jejunostomy tube (J-tube), and abdominal closure. He remained in the ICU for several weeks until ventilatory support could be reduced, and was transferred to the hospital ward when he was able to tolerate J-tube and oral feeding. On postoperative day 35, he was transferred to a long-term care facility.

Conclusions: Acute pancreatitis is usually managed conservatively, and surgical management has become less common. A case of acute necrotic fluid collection arising within the first four weeks of onset of acute necrotizing pancreatitis is presented that underwent spontaneous intraperitoneal rupture leading to ascites, peritonitis, and hemodynamic instability, requiring emergency surgical management.

MeSH Keywords: **Pancreatic Fistula • Pancreatic Juice • Pancreatic Pseudocyst**

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/914571>

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Background

Acute pancreatitis can be due to gallstones, alcohol, trauma, and can occur following some medications [1–3]. According to the 2012 revised Atlanta classification, acute pancreatitis has two main presentations that include acute interstitial edematous pancreatitis and necrotizing pancreatitis. Interstitial edematous pancreatitis presents more commonly, with only 5–10% of acute cases presenting as necrotizing pancreatitis [1,4,5]. Peripancreatic fluid collections are a frequent complication of both types of pancreatitis, occurring in between 30–50% of cases [6].

The recently revised Atlanta classification subdivides acute fluid collections, which occur within four weeks of the onset of acute pancreatitis, into acute peripancreatic fluid collection (APFC), which can lead to pancreatic pseudocyst, and acute necrotic fluid collection (ANC), which contains necrotic debris [5]. Acute pancreatitis is usually managed conservatively, and the management of acute peripancreatic fluid collection is usually with supportive measures because the immature fibrous tissue of the wall of the collection is prone to rupture during surgical intervention [3]. Surgical management of the complications of acute pancreatitis, including infected pancreatic necrosis or pseudocyst, is becoming less common due to the increasing use of endoscopic or percutaneous drainage and debridement [4].

In most cases, the acute peripancreatic fluid collection and the acute necrotic fluid collection will resolve with time and supportive care, and surgical intervention is reserved for symptoms that include increasing size, or complication such as infection, hemorrhage, rupture, fistula formation, or obstruction [7,8]. Occasionally, fluid collections or pseudocysts can erode into adjacent hollow viscera of the gastrointestinal tract causing a fistulous connection and spontaneous internal drainage. The transverse colon and splenic flexure are the most common sites for fistula formation, followed by the duodenum, small intestine, and stomach. Fistula formation may be associated with symptoms that include diarrhea, hematochezia, or hematemesis depending on the fistula location and whether there is erosion into adjacent blood vessels [7]. The mechanisms associated with rupture and hemorrhage include the activation of lytic pancreatic enzymes that digest and disrupt the adjacent wall of a hollow viscus and blood vessels, compression of adjacent organs that results in local ischemia, and localized compression of the portal or splenic vein resulting in portal hypertension with hemorrhage [7,9]. The symptoms and location of the fistula determine surgical management, as gastric and enteric fistulas have a high rate of spontaneous closure, while duodenal and colonic fistulas are more likely to require surgical intervention for definitive management [10].

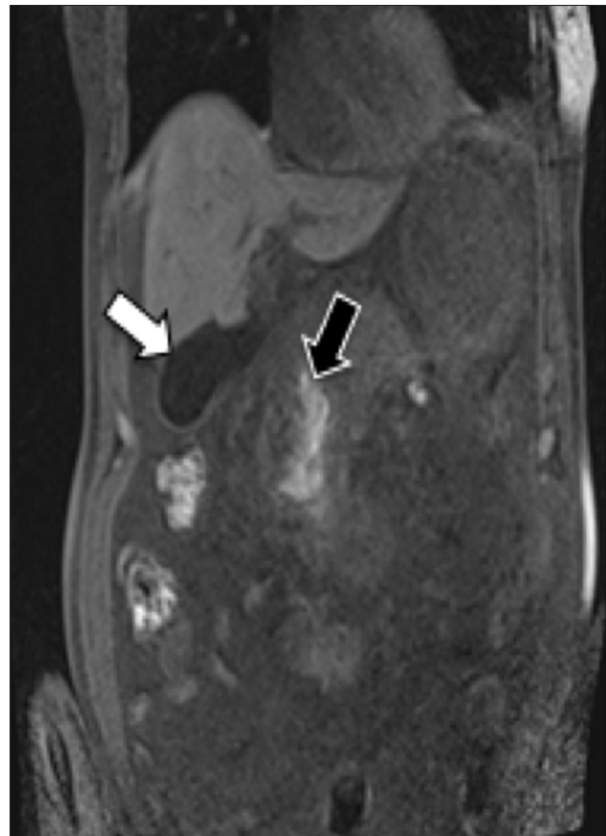


Figure 1. Magnetic resonance cholangiopancreatography (MRCP) with intravenous contrast shows an acute necrotic fluid collection associated with necrotizing pancreatitis. An acute necrotic fluid collection associated with necrotizing pancreatitis is shown measuring 14.0×7.4×6.9 cm with reduced enhancement of the pancreatic parenchyma. The white arrow shows a normal gallbladder without evidence of cholecystitis or choledocholithiasis. The black arrows show the pancreas with reduced enhancement and a surrounding fluid collection.

This report is of a case of spontaneous intraperitoneal rupture of an acute necrotic fluid collection due to acute necrotizing pancreatitis, associated with ascites, peritonitis, and hemodynamic instability, which required emergency surgery.

Case Report

A 61-year-old man was admitted to the emergency department with abdominal pain, nausea, and vomiting. Five days previously, he had been discharged from hospital following recent hospital admission for necrotizing pancreatitis due to gallstones. He had been managed conservatively and follow-up had been planned for the evaluation of elective cholecystectomy.

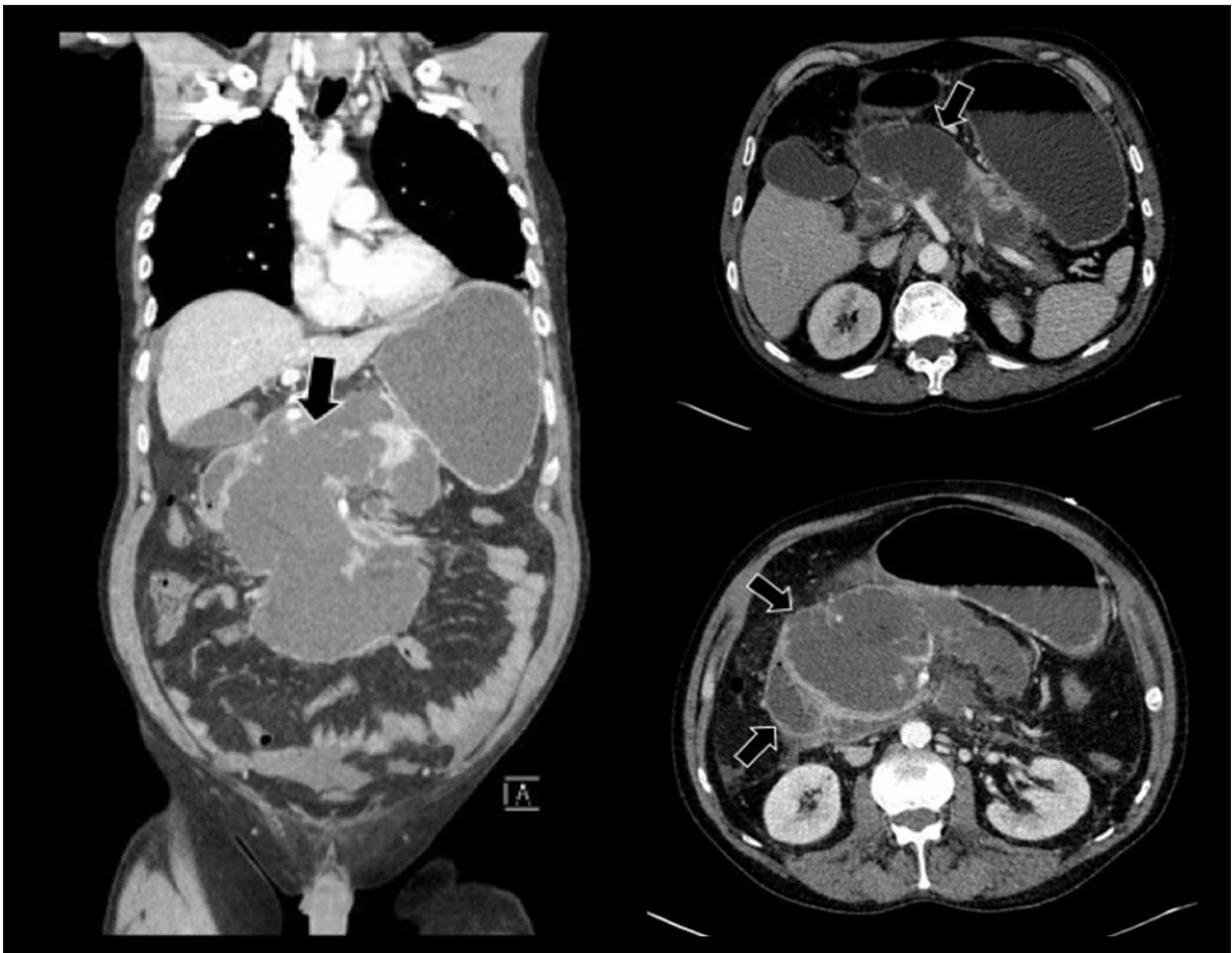


Figure 2. Computed tomography (CT) imaging of the abdomen with intravenous contrast shows an acute necrotic fluid collection associated with necrotizing pancreatitis. A large multiloculated collection of peripancreatic fluid is shown that has not significantly changed from the previous imaging with magnetic resonance cholangiopancreatography (MRCP). The black arrows show the pancreas with reduced enhancement and a surrounding fluid collection.

Imaging of the abdomen was performed using magnetic resonance cholangiopancreatography (MRCP) with intravenous contrast, which cholelithiasis without choledocholithiasis or cholecystitis, necrotizing pancreatitis, the development of a loculated peripancreatic fluid collection centered around the pancreatic head and body (Figure 1). The patient was admitted to hospital and remained nil by mouth and was given intravenous (IV) fluids and pain medication. During the next five days, his symptoms improved on conservative management and he began to tolerate food. However, on the sixth day following hospital admission, the patient developed fever and leukocytosis, although his vital signs remained stable. He was treated empirically with IV antibiotics due to concern for possible infected pancreatic necrosis. An abdominal computed tomography (CT) scan (Figure 2) showed that the peripancreatic fluid collection was stable in size, although there was compression of the distal duodenum associated with dilation of the stomach and esophagus.

On the seventh day following hospital admission, the patient woke with severe abdominal pain, abdominal distension, nausea, and vomiting. He became hemodynamically unstable and developed respiratory distress, which was initially attributed to aspiration pneumonitis. He was intubated, a nasogastric tube was placed, and he was transferred to the intensive care unit (ICU). He had an initial aggressive volume resuscitation but ultimately required multiple vasopressors for hemodynamic support. Physical examination showed abdominal tenderness in keeping with peritonitis. A repeat CT scan (Figure 3) showed that the peripancreatic fluid collection had decreased in size but there was intraperitoneal free fluid consistent with rupture of an acute necrotic fluid collection associated with necrotizing pancreatitis.

The patient was transferred as an emergency to the operating room for exploratory laparotomy. More than two liters of ascites was evacuated from the abdominal cavity. There was

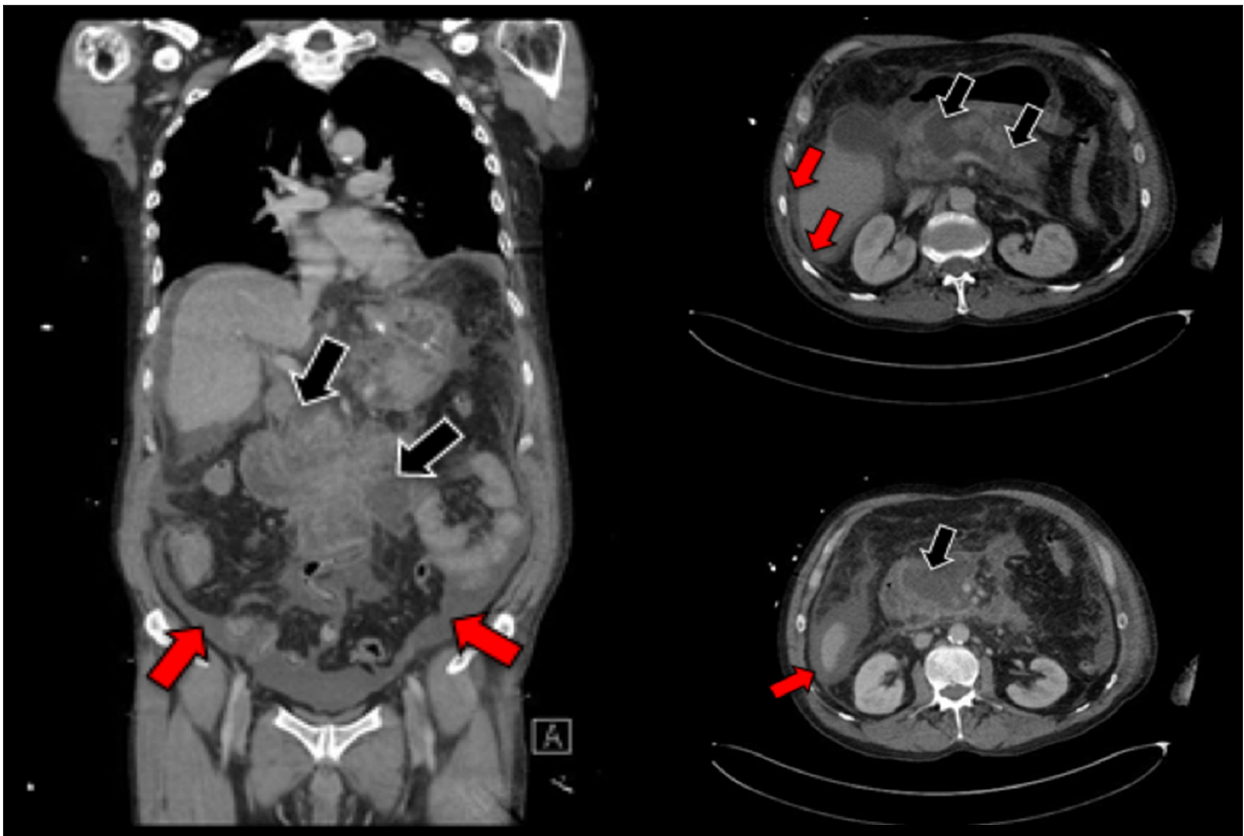


Figure 3. Computed tomography (CT) imaging of the abdomen with intravenous contrast shows the reduced size of the peripancreatic fluid collection but signs of peritoneal rupture. The peripancreatic fluid collection is reduced in size. There is a sudden appearance of ascites that suggests spontaneous intraperitoneal rupture. The black arrows show the peripancreatic fluid collection. The red arrows show the ascites.



Figure 4. Intra-operative photograph taken at emergency exploratory laparotomy. Saponification of the transverse colon mesentery is shown with drainage of necrotic pancreatic fluid, consistent with the site of intraperitoneal rupture.

saponification throughout the mesentery of the transverse colon, and one of the larger areas of saponification was actively draining cloudy pancreatic fluid, consistent with the site of

intraperitoneal rupture (Figure 4). In the operating room, radiopaque silicone Blake drains were placed in the lesser sac and at the base of the mesentery of the transverse colon at the site of the intraperitoneal rupture. The abdomen was left open and an ABThera™ open abdomen negative pressure therapy (NPT) system (KCI USA Inc., San Antonio, TX, USA) was used. The patient underwent postoperative resuscitation in the intensive care unit (ICU) and his condition improved with antibiotic treatment and external drainage. Intra-operative fluid cultures grew Gram-positive *Micrococcus* and he was treated with IV meropenem.

On postoperative day 2, abdominal imaging showed a persistent peripancreatic fluid collection near the posterior stomach. The patient was taken back to the operating room on postoperative day 3 and underwent open cystgastrostomy, cholecystectomy, jejunostomy tube (J-tube) placement, and abdominal closure. He had a prolonged stay in ICU due to delay in discontinuing ventilatory support but was eventually extubated and tolerated enteral nutrition. He was transferred to the surgical ward where he continued his recovery, and oral feeding recommenced. The surgical drains were removed when the

fluid drainage became minimal. His postoperative course was complicated by the development of an intra-abdominal abscess that required percutaneous drainage. Contrast-enhanced imaging showed no evidence of a leak at the cystgastrostomy site. The patient was discharged from hospital on postoperative day 35, and continued his recovery and rehabilitation in a long-term care facility with ongoing IV antibiotic therapy.

Discussion

This report is of a case of spontaneous intraperitoneal rupture of an acute necrotic fluid collection due to acute necrotizing pancreatitis, associated with ascites, peritonitis, and hemodynamic instability, which required emergency surgery. The revised Atlanta classification of acute fluid collections associated with acute pancreatitis includes acute peripancreatic fluid collection (APFC), which can lead to pancreatic pseudocyst, and acute necrotic fluid collection (ANC) containing necrotic debris [5].

Intraperitoneal rupture of acute peripancreatic fluid collection or pseudocyst is rare, but there have been several previously published cases that have reported intraperitoneal rupture after blunt abdominal trauma in patients with known pancreatic pseudocysts [11–13]. In these cases, clinical management approaches have depended on the hemodynamic status of the patient and abdominal examination and imaging. Most patients with pancreatic pseudocyst have been reported to undergo exploratory laparotomy with either internal or external drainage of the ruptured pseudocyst, although percutaneous drainage with peritoneal lavage has been described as a possible alternative treatment [14].

Spontaneous intraperitoneal rupture of pancreatic pseudocyst or cysts containing necrotic fluid has been less commonly reported, with only a few case reports in the published literature [6,15,16]. Two of the previously reported cases were associated with intracystic hemorrhage [6,15]. In 2016, Rocha et al. described two patients with spontaneous intraperitoneal rupture of pancreatic pseudocyst complicated by ascites [16]. One of the two patients underwent exploratory laparotomy with cystojejunostomy, as the draining site of the pancreatic cyst was clearly identified [16]. The second patient underwent exploratory laparotomy, but as the walls of the pseudocyst were not easily identified, the patient underwent external drainage and lavage [16]. In the case of the second patient, a pancreatic

fistula was successfully managed with total parenteral nutrition and treatment with octreotide for two weeks followed by removal of the drains and discharge from hospital [16].

In the present case, the management of the patient was driven by his rapid development of peritonitis and hemodynamic instability despite resuscitation, and he underwent exploratory laparotomy with drainage of a large volume of ascites. This patient had a significant degree of inflammation and saponification of the small bowel and although the site of intraperitoneal rupture was identified, and active drainage commenced, the patient was not stable enough to undergo a definitive internal drainage procedure at the time of initial operation. Therefore, multiple drains were sited and his abdomen was left open. He was resuscitated in the intensive care unit (ICU), and after clinical improvement, he returned to the operating room for internal drainage with cystgastrostomy with external drains left in place at the site of the intraperitoneal rupture. Also, in this case, given his history of gallstones, the patient underwent cholecystectomy, and a jejunostomy tube (J-tube) was sited to facilitate enteral feeding. Although this patient had an extended hospital course, he was discharged to a long-term care facility on postoperative day 35.

Conclusions

Spontaneous intraperitoneal rupture of an acute necrotic fluid collection due to acute necrotizing pancreatitis is rare. As this case report has shown, the decision to perform surgical management depends on the type and severity of clinical complications. In patients who are hemodynamically unstable with signs of peritonitis, open surgical intervention is required for drainage of the necrotic fluid, control of bleeding, and repair of damaged tissue, with continued patient resuscitation until final abdominal closure is performed. For patients without peritonitis who are clinically more stable, it may be possible to attempt percutaneous drainage of intraperitoneal fluid, with or without ongoing peritoneal lavage, or to use external drains and conservative management. As this case has shown, imaging of the abdomen should be performed as soon as possible to provide a clear diagnosis and to allow individualized treatment planning, including optimal surgical management.

Conflict of interest

None.

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