



Lumbar Artery Pseudoaneurysms Presenting as a Novel Complication of Severe, Necrotizing Pancreatitis

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ABSTRACT

Splanchnic artery pseudoaneurysms are a known complication of necrotizing pancreatitis. Lumbar artery pseudoaneurysms are rare and usually associated with trauma, renal biopsy, or spinal procedures. We present a rare case of lumbar artery pseudoaneurysms as a complication of necrotizing pancreatitis. A 55-year-old man initially presented with necrotizing biliary pancreatitis complicated by peripancreatic necrotic fluid collections and walled-off necrosis requiring multiple endoscopic ultrasound-guided necrosectomies. Inferoposterior extension of collections to the retroperitoneum caused lumbar artery pseudoaneurysms, leading to hemorrhagic shock from retroperitoneal and intraperitoneal hemorrhages.

KEYWORDS: necrotizing pancreatitis; pancreas; pancreatic cysts; pancreatic necrosis; pancreatic pseudocyst; pseudocyst

INTRODUCTION

Acute and chronic pancreatitis are known to cause several complications, including pancreatic fluid collections, splanchnic venous thrombosis, and pseudoaneurysms.¹ Pseudoaneurysms most commonly involve the splenic artery, gastroduodenal artery, and pancreaticoduodenal artery.² Lumbar artery pseudoaneurysms are rare and most often associated with blunt or penetrating trauma, although even rarer cases have been reported in association with renal biopsy as well as other spinal and paraspinal procedures.³⁻⁸ We present a rare case of lumbar artery pseudoaneurysms causing retroperitoneal hemorrhage as a complication of severe, necrotizing pancreatitis with peripancreatic walled-off necrosis (WON).

CASE REPORT

A 55-year-old man presented with a history of alcohol use and necrotizing biliary pancreatitis. Before the most recent admission, he had been hospitalized 2 times over 3 months after developing an acute portal vein thrombus requiring anticoagulation with therapeutic enoxaparin and large multiloculated peripancreatic fluid collections eventually forming WON. He had 2 EUS-guided cystogastrostomy procedures with a lumen-apposing metal stent and 1 double-pigtail catheter placed during the initial procedure. This was successfully deployed near the posterior wall of the gastric body adjacent to the pancreatic body after color Doppler imaging confirmed the absence of interposed blood vessels. Two weeks later, he underwent 2 endoscopic necrosectomies with removal of the initial lumen-apposing metal stent and pigtail catheter and placement of 2 double-pigtail catheters. Three weeks after this, he had a subsequent necrosectomy with replacement of the double-pigtail catheters. However, computed tomography imaging showed persistent WON (11.5 × 6.2 cm) with inferoposterior extension of peripancreatic necrotic collections (Figure 1).

A few days later, he had worsening abdominal pain and fevers. He was admitted for sepsis from necrotizing pancreatitis with white blood cell count 29.6 (10⁹ cells/L), hemoglobin 8.7 g/dL, and international normalized ratio 1.3. On hospital day 5, he became hypotensive and tachycardic with lactic acidosis, worsening anemia (hemoglobin 5.3 g/dL), an international normalized ratio of 1.9, and an activated partial thromboplastin time of 26 (normal range 25–35) seconds, requiring escalation to the intensive care unit for hemorrhagic shock.

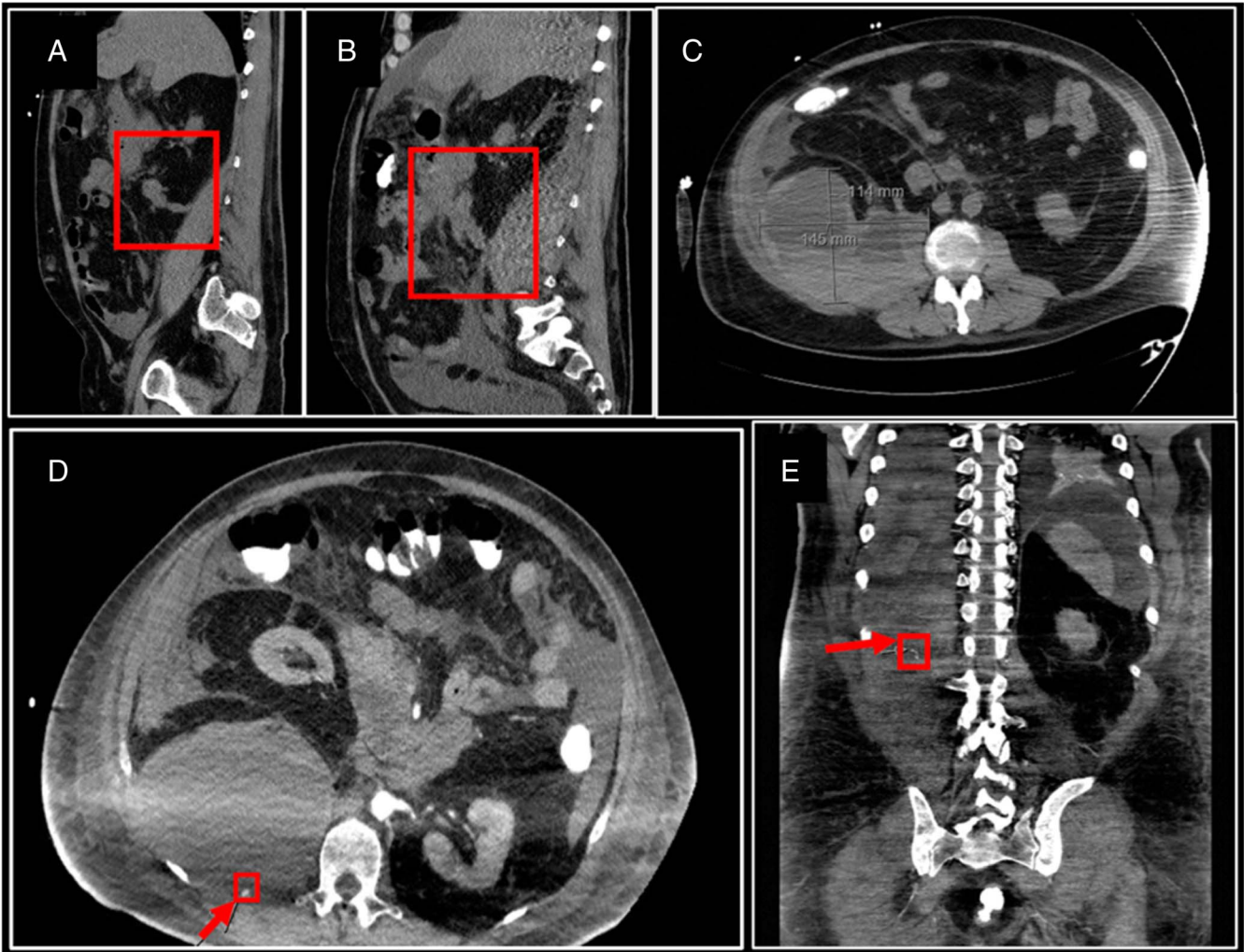


Figure 1. (A) Noncontrast CT before admission identifying early inferoposterior extension of peripancreatic inflammation. (B, C) Noncontrast CT during admission, 4 days before EUS, identifying further inferoposterior extension near iliopsoas muscles and a 14.5 × 11.4 cm retroperitoneal hematoma. (D, E) CT angiography showing a focus of linear serpiginous arterial contrast in the upper aspect of the retroperitoneal hematoma, suspicious for active arterial bleeding. The splenic and gastroduodenal arteries were patent, with no evidence of active hemorrhage or pseudoaneurysm. The red squares highlight the inferoposterior extension of the peripancreatic inflammation (A, B). The red squares were used to show the sites of active arterial bleeding (D, E). CT, computed tomography; EUS, endoscopic ultrasound.

Computed tomography identified a retroperitoneal hematoma with intraperitoneal hemorrhage (Figure 1). Enoxaparin was discontinued, but despite a massive transfusion protocol and administration of protamine sulfate, he had only temporary improvement in blood pressure and anemia continued to worsen, concerning for persistently active hemorrhage.

Computed tomography angiography showed a small serpiginous area of internal arterial enhancement, consistent with active arterial bleeding into the hematoma (Figure 1). Interventional radiology performed an angiogram that identified L2 and L3 distal lumbar artery focal pseudoaneurysms with extravasation (Figure 2); thus, coil embolization was performed (Figure 2). Additional angiographic evaluation was performed with selective catheterization and imaging of the celiac axis with attention to the right upper quadrant, superior mesenteric artery, and right internal iliac artery. No focal pseudoaneurysm, evidence of

vasculitis, or active extravasation was identified within these vascular territories. After his blood pressure stabilized, he was transferred to our tertiary care center in a critical condition.

The patient had continued blood transfusion requirements and was emergently taken to the operating room for exploratory laparotomy for evacuation of retroperitoneal and intraperitoneal hematomas. During the initial surgery, large clots with active arterial bleeding were seen and successfully controlled with electrical cautery. During the hospitalization, the patient also required subsequent surgeries for re-exploration and cholecystectomy. He required several transfers to the intensive care unit, and the hospital course was also complicated by nonobstructive ileus, pleural effusion requiring thoracentesis, bacteremia, and hydronephrosis from retroperitoneal inflammation. At the end of this 4-week hospital stay, an esophagogastroduodenoscopy was performed for dilation of the posterior cystogastrostomy of

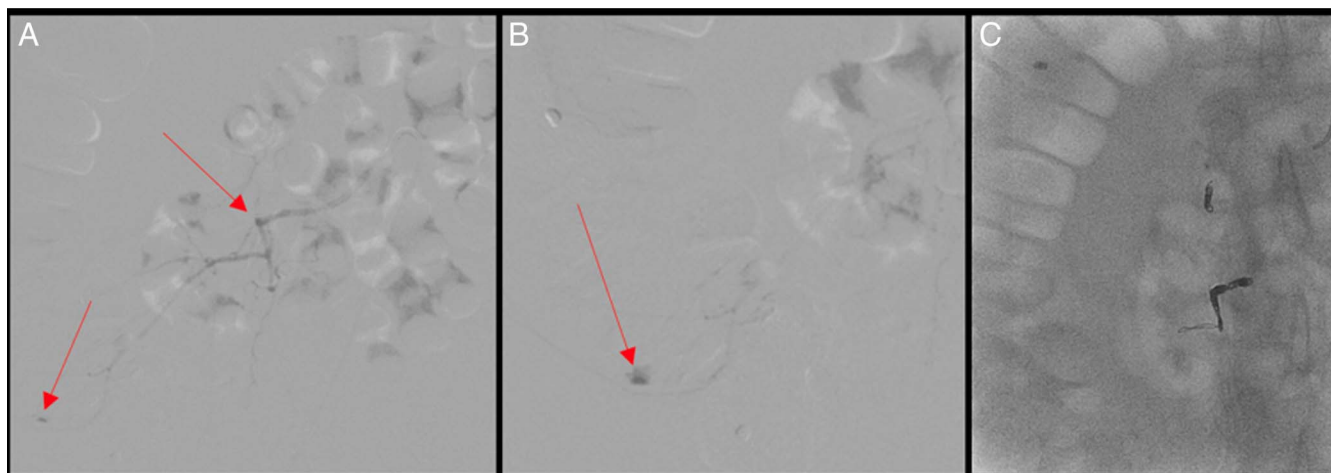


Figure 2. (A) Interventional radiology angiogram of the L3 lumbar artery demonstrating pseudoaneurysms arising from the distal muscular branches. (B) Active extravasation from distal L3 lumbar pseudoaneurysm. (C) Successful coil embolization of L2 and L3 lumbar arteries. The red arrows show the exact location of the pseudoaneurysms on angiography.

the stomach and necrosectomy was performed with 2 double-pigtail stents left in place. To our knowledge, the patient is currently living and has not had further complications. Figure 3 shows a time line of the patient’s imaging, procedures, and interventions over the total 5-month period.

Pseudoaneurysm development of splanchnic arteries in severe, necrotizing pancreatitis is a rare complication² that carries significant morbidity and mortality.⁹ Typically, this is caused by autodigestion from proteolytic pancreatic enzymes, which causes arterial wall weakening and degradation of elastic tissues.^{9–11} In addition, a long-standing pseudocyst or WON can induce a pseudoaneurysm by direct compression or ischemia.¹⁰ Aside from 1 similar case,¹¹ lumbar artery pseudoaneurysms have only been reported in patients with spinal, paraspinal, or retroperitoneal surgery; biopsy of a retroperitoneal organ; or trauma (both blunt and penetrating).^{3–8}

Although endovascular angiography has the highest diagnostic yield¹² and coil embolization has improved success rates, recurrence of pseudoaneurysms and overall mortality remain high.⁹ These patients often have multiple complications of pancreatitis, which may include splanchnic venous thrombosis. Like our case, these patients require therapeutic anticoagulation, which can also increase risk of hemorrhage from pseudoaneurysms. Although most cases of lumbar artery pseudoaneurysms have been successfully managed with coil embolization,^{3–8} treatment may involve a combination of endoscopy, radiology, and surgery to minimize risk of rebleeding and to reduce mortality.^{9,12}

Our case highlights a complicated disease course in a patient with biliary pancreatitis with severe peripancreatic necrosis, WON development, and no known history of risk factors of lumbar artery pseudoaneurysm formation. We believe the inferior and posterior extension of peripancreatic necrosis that

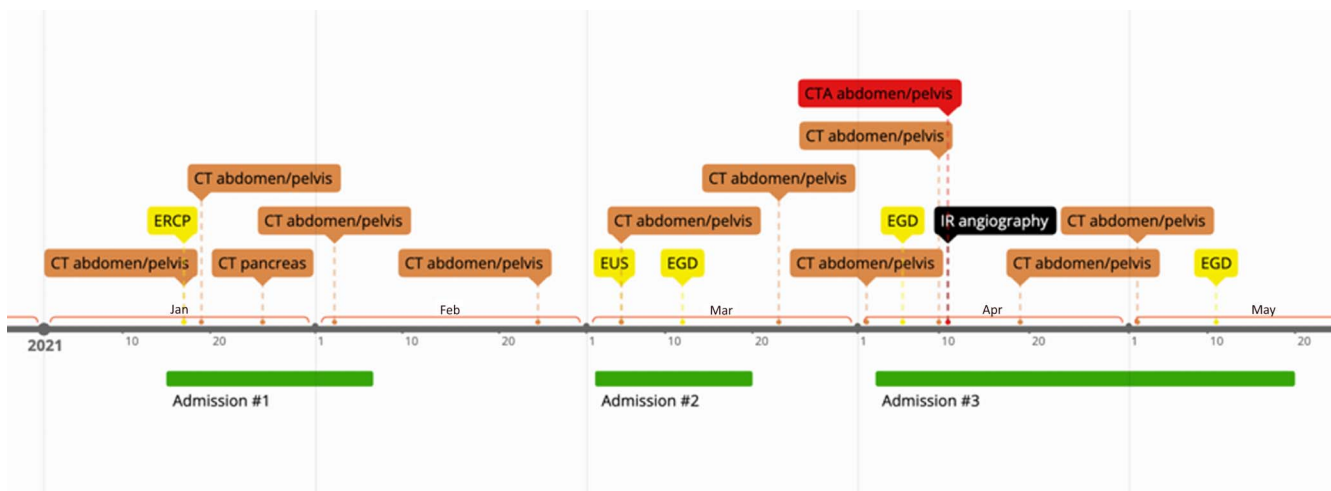


Figure 3. Time line diagram for the disease course including CT images, endoscopic procedures (EGD, EUS, and ERCP), and IR angiography. CT, computed tomography; EGD, esophagogastroduodenoscopy; ERCP, endoscopic retrograde cholangiopancreatography; EUS, endoscopic ultrasound; IR, interventional radiology.

eventually extended into the retroperitoneum resulted in lumbar artery pseudoaneurysms. This is a peculiar complication of pancreatitis but should be noted for consideration of alternative sources of potentially life-threatening bleeding in these patients.

DISCLOSURES

Author contributions: A. Khurana performed the chart review, gathered relevant data, and wrote the manuscript. V. Chittajallu aided in the editing and formatting process for the manuscript. S. Reed performed the angiography on this patient. C. Sutter helped gather appropriate images and provide insight into the suspected pathophysiology related to this case report. B. Glessing is the principal investigator for this case report. B. Glessing is the article guarantor.

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All attempts have been exhausted in trying to contact the patient, next of kin, and/or parent/guardian for informed consent to publish their information, but consent could not be obtained.

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