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Case Report

Rupture of Splenic Artery Pseudoaneurysm

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Abstract **Rupture of splenic artery pseudoaneurysm is a rare but serious condition, which needs in time proper investigations and treatment. This article represents a case of 37-year-old man with history of alcoholic pancreatitis presented with sudden abdominal pain and cardiac arrest. After CPR and resuscitation, he was sent for abdominal computerized tomography and operation. Even the operation was successful, the patient died 2 days later. High index of suspicion and fast effective approach would give better outcome.**

Key words: **pancreatitis, pseudoaneurysm rupture, splenic artery**

Introduction

Splenic artery pseudoaneurysm is an uncommon condition but frequently accompanied by fatal complications such as rupture and bleeding. The most common cause of pseudoaneurysmal formation is pancreatitis. History about past illness, trauma and surgery may guide to think of this condition and to confirm diagnosis with proper investigation such as angiography, doppler ultrasonography or CT scan. The way in which a splenic artery pseudoaneurysm manifests itself is usually nonspecific and requires high index of suspicion for diagnosis. Because of such dangerous hemorrhagic complications, survival depends on immediate diagnosis, appropriate endovascular and/or surgical approaches.

Case Report

A 37-year-old man had severe epigastric pain and dyspnea for 1 hour. On the way to hospital, he became restless, then lost of consciousness 5 minutes before arrival. Cardiac arrest occurred at the emergency room. After 18 minutes of CPR, he was admitted in ICU with blood pressure 99/45 mmHg. Surgical consultation was requested to evaluate bulging abdomen. The patient had a history of acute alcoholic pancreatitis one month ago. Bedside abdominal ultrasonographic examination demonstrated free fluid and ultrasound guided abdominal paracentesis showed frank blood. Patient had unstable blood pressure and was transferred to operating room immediately. Operative finding showed hemoperitoneum 2,000 ml,

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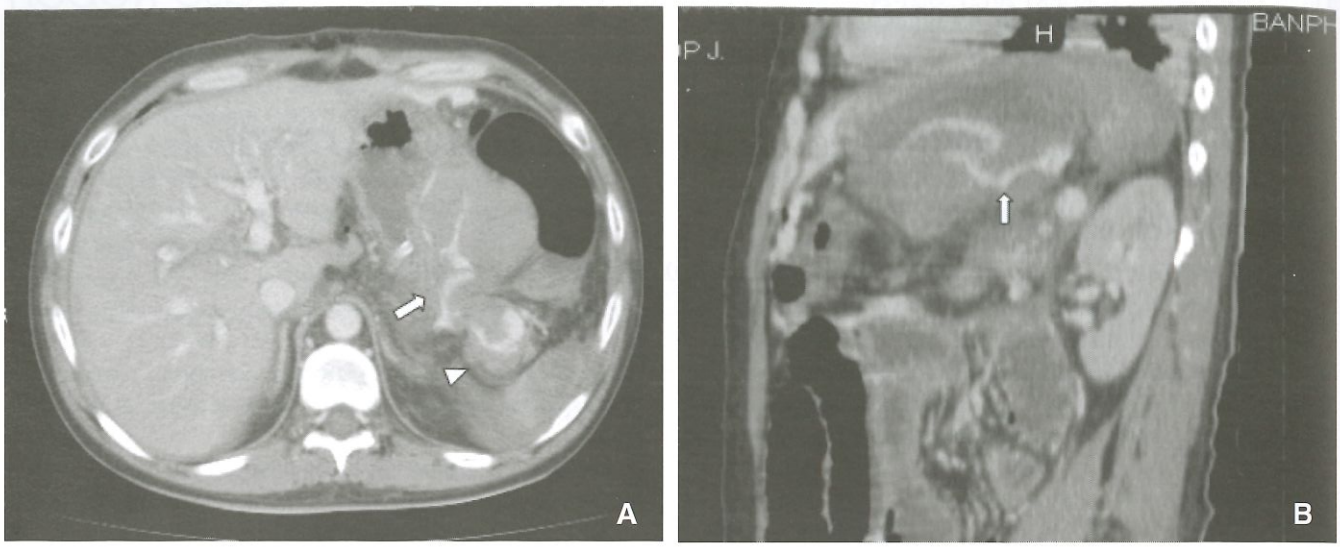


Figure 1 A, B, Computed tomography demonstrates abnormal dilatation of splenic artery(arrowhead) and leakage of contrast material into lesser sac (arrow).

5 cm pulsatile expansible mass over tortuous abdominal aorta at base of transverse mesocolon, large blood clot in lesser sac without active bleeding. Concealed rupture visceral aneurysm was suspected, then abdomen was closed temporarily and patient was transferred to perform abdominal CT scan while blood pressure 100/60 mmHg. CT scan demonstrated active bleeding from rupture splenic artery aneurysm (Figure 1 A, B). There were multiple aneurysms from branches of celiac artery, superior mesenteric artery and right iliac artery (Figure 2 A-D). After CT scan, he developed hypotension and was re-operated again. Sterile skin draping was extended include left chest wall for emergency aortic control. After intraperitoneal blood and blood clot was removed, dissection of left triangular ligament for supraceliac aortic clamping was attempted, but it was time consuming due to dense adhesion from previous inflammation process. Patient underwent left anterolateral thoracotomy with intrathoracic aortic clamping. Spleen and tail of pancreas was mobilized, aortic clamp was removed and applied over pancreas proximal to bleeding site. Distal pancreas and spleen were resected finally.

Postoperative period, patient had multiple organ failure and died 2 days later. Pathological report described rupture of pseudoaneurysm of splenic artery.

Discussion

Splenic artery aneurysms are rare. The estimated prevalence varying from 0.2-10.4%[3], but pseudoaneurysms are more rare. The most affected site of visceral artery pseudoaneurysm is splenic artery. In a study from the Mayo Clinic, there were only 10 splenic artery pseudoaneurysms collected in 18 years[1].

Pathophysiology and clinical presentations

The causes of splenic artery pseudoaneurysm are pancreatic diseases (acute or chronic pancreatitis, pancreatic pseudocyst) 52%, abdominal trauma 29%, post operative complication 3%, peptic ulcer disease 2%[1]. Pathogenesis of pancreatic pseudoaneurysm includes autodigestion of splenic and peripancreatic arteries by enzyme-rich fluid, often within pseudocyst, leading to weakening wall of artery and ruptured into pseudocyst turns pseudocyst into pseudoaneurysm. Pseudocyst can directly erode into adjacent artery and therefore turning pseudocyst into pseudoaneurysm[4]. The common site of visceral artery pseudoaneurysm next to splenic artery (30-50%) are gastroduodenal artery (10-15%), pancreaticoduodenal artery(10%), left gastric artery, hepatic artery and intrapancreatic arteries[5].

Different form splenic artery aneurysm, patient with splenic artery pseudoaneurysm is always symptomatic[3]. The most common presentation is bleeding defined as hematochezia or melena (26.2%), hemorrhage into pancreatic duct (hemosuccus pancreaticus) (20.3%) and hematemesis (14.8%). The second common is abdominal pain (29.5%).

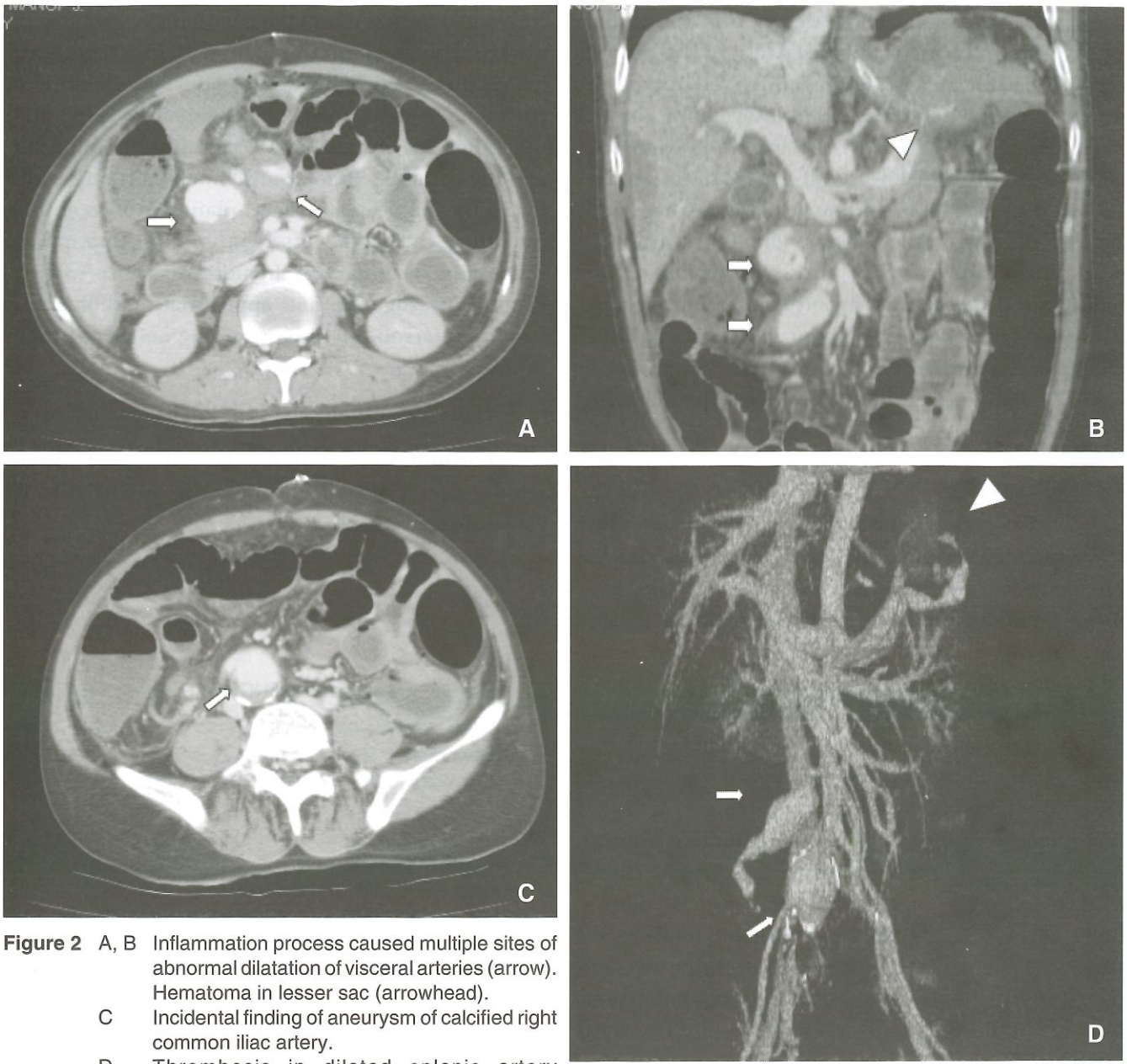


Figure 2 A, B Inflammation process caused multiple sites of abnormal dilatation of visceral arteries (arrow). Hematoma in lesser sac (arrowhead).
C Incidental finding of aneurysm of calcified right common iliac artery.
D Thrombosis in dilated splenic artery (arrowhead), silent dilation of visceral artery and right common iliac artery (arrow).

Nonspecific symptoms are nausea, vomiting, chest pain and back or flank pain. Only 2.5% of cases present incidentally[1]. The size of the psuedoaneurysm is not a determinant of rupture.[2] The risk of rupture of a splenic artery pseudoaneurysm is 37% with the mortality rate of 90% when untreated[3]. In case of pancreatitis, the highly suggestive symptoms for ruptured pseudoaneurysm included anemia of unexplained cause, recurrent or intermittent hematemesis or hematochezia, rapid enlargement of pseudocyst or pulsatile abdominal mass and the syndrome known as hemosuccus pancreaticus.[4] A pseudoaneurysm may rupture into a pseudocyst, gastrointestinal tract, peritoneal cavity or pancreatic parenchyma causing fatal complication. Prompt diagnosis and immediate treatment are mandatory.

Angiography is the gold standard investigation for these patients, but it is not always available. The initial imaging is usually Doppler ultrasonography. The sonographic appearance varies depending on size of lesion, presence and extent of patency of lumen, which is continuous with vessel, size of thrombus,

presence of hemorrhage and degree of calcification. The typical finding is multilayered lesion with central or peripheral anechoic lesion, which is continuous with arterial lumen. Most useful information can be obtained from abdominal CT scan including diagnostic confirmation, diseased vessel(s), extent of thrombus, size and extent of lesion, presence of hemorrhage and status of distal and other organs. On non-contrast CT scan, pseudoaneurysm shows hypodense or multilayered lesion, and hyperdense lesion if acute hemorrhage. Contrast enhanced CT scan shows enhancement within lesion continuous with diseased vessel[6]. MRI is also useful especially in patient with renal failure.

Treatment

Due to high risk of rupture and high mortality rate if splenic artery pseudoaneurysm ruptures, various interventions have been used for both ruptured and intact pseudoaneurysms. In patient with stable vital sign, transcatheter embolization at artery proximal and distal to the arterial pathology can be performed with improving success rate. Other treatment options included percutaneous injection of thrombin into the sac of pseudoaneurysm[2] and endovascular stenting. If the patient is hemodynamically unstable, surgery is the treatment of choice. The most common surgical procedure is splenectomy with or without distal pancreatectomy. Ligation alone is associated with high failure rate. Surgery is the better modality of treatment for ruptured psuedoaneurysm associated with pseudocyst than transcatheter embolization because of the difficulty of embolizing large pseudocyst cavity[1].

Conclusion

Although splenic artery pseudoaneurysm is rare, surgeons may experience this condition in their routine works. It is usually accompanied by life-threatening hemorrhagic complication. The major cause of pseudoaneurysmal formation is pancreatitis followed by abdominal trauma, post operative complication and peptic ulcer. Preoperative imaging is very useful for confirming diagnosis and planning of treatment including radiologic intervention for therapeutic hemostasis or temporary hemostasis before surgery. Prompt investigation and appropriate radiologic or surgical intervention give promising better outcome.

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