

SHORT REPORT

Transcatheter Embolization of a Giant Gastroduodenal Artery Aneurysm: A Case Report

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We report a case of a 51-year-old patient with chronic pancreatitis and a giant gastroduodenal artery pseudoaneurysm. Noninvasive radiological procedures precisely defined the gastroduodenal artery pseudoaneurysm. Catheter angiography revealed the site of extravazation in the upper third of the gastroduodenal artery, and enabled successful embolization with coils. Follow-up CD sonography confirmed complete occlusion and secondary thrombosis of the giant pseudoaneurysm.

Keywords: Pancreatic pseudoaneurysm; Gastroduodenal artery; Therapeutic embolization.

Introduction

Gastroduodenal artery pseudoaneurysms are rare, however, they present life-threatening clinical condition. They develop mainly secondary to pancreatitis, but rare causes such as atherosclerosis, trauma, iatrogenic lesions, mycotic or tuberculous inflammation, and connective tissue disease have been described. Dominating symptoms of gastroduodenal artery pseudoaneurysm are symptoms of pancreatitis as a basic pathologic condition, and its rupture is manifested with dramatic clinical manifestation of abdominal bleeding and hemorrhagic shock, which is associated with high mortality rate.^{1–4}

Case Report

A 51-year-old male patient, alcohol addict, was admitted to our hospital due to recurrent onset of nausea, hematemesis and epigastric pain. On admission to our hospital mild anemia (hemoglobin 105),

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slight hyperglycemia, and mild amylosuria were found, and Karnofsky score was 80. During hospitalization the patient was hemodynamically stable, without further drop in red blood cell count.

To clarify the cause of upper gastrointestinal bleeding, an esophagogastroduodenoscopy was performed, which showed normal endoscopic finding without esophageal and gastric varices. Endoscopic ultrasonography (EUS) revealed an inhomogeneous structure of pancreatic body and tail, with multiple calcifications and a distally dilated tortuous pancreatic duct. In the region of the pancreatic head a 7.5×5-cm pseudoaneurysm was identified, with turbulent arterial flow within the mass on CD sonography.

Plain and contrast-enhanced abdominal CT scan (Fig. 1) confirmed diagnosis of chronic pancreatitis and pseudoaneurysm in the pancreatic head. The CT findings suggested the possibility of the secondary blood vessel erosion and bleeding into the formed pancreatic head pseudocyst.

A diagnostic angiography with selective common hepatic artery angiogram, and superselective gastroduodenal artery angiogram showed a punctiform extravazation of the contrast medium in the proximal third of the gastroduodenal artery, A 7.5×5 cm pseudoaneurysm was revealed in the parenchymal and venous phase (Fig. 2(a) and (b)). A catheter was



Fig. 1. Axial nonenhanced CT of upper abdomen demonstrating expansive mass in the pancreatic head and extensive calcifications in pancreatic body and tail.

placed deeply in the gastroduodenal artery under the level of extravazation, and embolization with four 4×3 -mm Tornado coils (Cook, USA) was performed, starting in the distal part of the gastroduodenal artery, and continuing till the gastroduodenal artery orifice. Post-embolization angiogram confirmed successful embolization outcome with complete occlusion of the gastroduodenal artery and absence of blood flow in the pseudoaneurysm (Fig. 2(c)). The procedure was uneventful and lasted 60 min.

The immediate post-embolization period passed without any complications. An ultrasound 48 h after embolization revealed complete occlusion of the gastroduodenal artery and secondary thrombosis in the pseudoaneurysmal sac. A follow-up CD ultrasonography 3 months after embolization confirmed

significant decrease of the thrombosed pseudoaneurysm size ($3.5 \times 2.5 \text{ cm}^2$) with secondary partitioning.

Discussion

Visceral artery pseudoaneurysm most often occurs as a complication in both acute and chronic pancreatitis.⁵ Inflammatory attacks can provoke erosion of peripancreatic blood vessels, and, in case of pancreatic pseudocyst coexistence, they can cause rupture into the pseudocyst with consequent aneurysm or pseudoaneurysm formation.^{1,3,6} Pancreatic pseudoaneurysms have been reported in 3.5–10% of patients with chronic pancreatitis. Their symptoms are usually covered by symptoms of chronic pancreatitis, and as soon as they rupture into gastrointestinal tract, biliary tree, peritoneal cavity or retroperitoneum, they manifest with dramatic clinical symptoms of hemorrhagic shock with consequent high mortality rate.^{2,3,6,7}

In diagnostic management of the patients, non-invasive diagnostic procedures are the priority: Ultrasonography with CD, EUS, contrast-enhanced CT, and MRI. Using these methods, the pseudoaneurysm size, parietal thrombus width, and intrapancreatic pseudoaneurysm topography could be defined. Due to visualization of the exact gastroduodenal artery lesion, measurement of gastroduodenal artery width and possible existence of arteriovenous fistula, catheter angiography remains mandatory for precise planning of the interventional or surgical procedure on gastroduodenal artery pseudoaneurysm.^{1,2,6,7}

The optimal treatment modality of arterial pseudoaneurysms in pancreatitis is controversial, with operative and interventional treatment as options.^{5,8} Minimal invasiveness, fast performing, and necessity of local anesthesia only, are the main advantages of

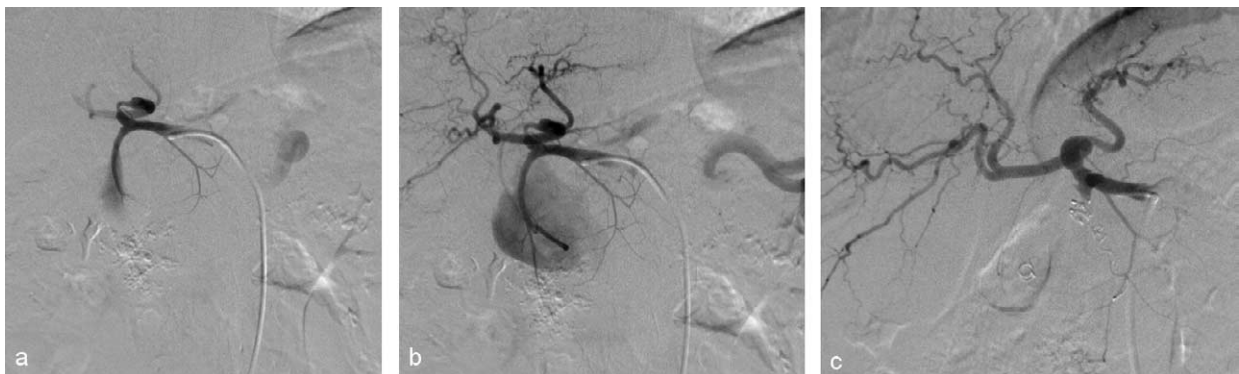


Fig. 2. Common hepatic artery angiography. (a) Early arterial phase: Punctiform lesion in the upper third of the gastroduodenal artery with initial filling of the pseudoaneurysm. (b) Late arterial phase: Gastroduodenal artery pseudoaneurysm. (c) After gastroduodenal artery embolization with coils: Complete occlusion of the gastroduodenal artery without enhancement of the pseudoaneurysm.

endovascular interventional procedure, opposite to complex, long-lasting surgical procedures of pancreaticoduodenal region in high-risk patients. Especially, poor prognosis and post-surgical recovery is seen in patients with pseudoaneurysm rupture with mortality rate between 16 and 50%.^{1,3,7,9,10} Successful cases of percutaneous thrombin injection in the management of a pseudoaneurysm secondary to pancreatitis have also been described.^{11,12}

The selection of embolization material depends on the pseudoaneurysm site and size, the artery lesion width, and on the practical experience of the radiologist. We applied four Tornado Cook coils, starting in distal part of gastroduodenal artery, and continuing till the gastroduodenal artery orifice. In case of giant pseudoaneurysms, treatment with coils and embolizing detachable balloons of adequate dimensions is often preferred, over fluid embolizing materials. Fluid embolizing materials could cause undesired ischaemic changes of the gastric wall and pancreatic parenchyma by possible regurgitation in the celiac trunk basin.

Postembolization secondary changes, including intraaneurysmatic thrombosis and regression, develop rapidly and mostly without any complications. On follow-up examination of this patient performed 3 month after embolization, we saw the reduction of thrombosed pseudoaneurysm of about 50%. In any hemodynamically stable patient, embolizing interventions are the method of choice in the treatment of giant gastroduodenal artery pseudoaneurysms due to their safety, effectiveness and minimal invasiveness.

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