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Interventional Radiology

Biliary obstruction necessitating choledochojejunostomy as a complication of endovascular coil erosion

Omar Safi Zuberi DO, Lu Anne V. Dinglasan MD, MHS*

Department of Radiology, University of Louisville, Louisville, KY

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ABSTRACT

We report the case of a 55-year-old patient presenting with biliary obstruction caused by coil migration from a recently performed embolization of a post-traumatic gastroduodenal artery pseudoaneurysm. Based on imaging findings, biliary drain placement was initially performed and the subsequent endoscopy demonstrated coil erosion into the common bile duct and duodenum, resulting in choledochoduodenal fistula. Choledochojejunostomy was thereafter performed to bypass the area of injury.

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Introduction

Endovascular coil embolization of visceral pseudoaneurysms is a well-established, minimally invasive option for treating acute intraperitoneal hemorrhage related to post-traumatic visceral pseudoaneurysms. Nontarget embolization resulting in end-organ ischemia or systemic migration into terminal vascular beds is a known potential risk of the procedure [1]. Other reported complications include intraprocedural dissection, pseudoaneurysm rupture, embolism, access artery pseudoaneurysm, and, although rare, coil migration [2]. We report a case of biliary obstruction secondary to coil erosion after gastroduodenal artery (GDA) embolization.

Case report

A 55-year-old man presented to interventional radiology for acute intraperitoneal hemorrhage following a rollover motor vehicle accident as the unrestrained driver in October 2016. Blood pressure at the scene was 70/30 mm Hg, with good response after a 500 mL bolus of normal saline. Blood pressure upon arrival to the emergency department was 106/59 mm Hg, with a heart rate of 86 beats/min. Relevant initial labs included a hemoglobin level of 13.0 g/dL, an elevated blood alcohol level of 300 mg/dL, and an elevated lipase level of 286 units/L.

The patient then underwent cross-sectional imaging, which demonstrated right C6-7 facet fractures, pseudoaneurysm of

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* Corresponding author.

E-mail address: lading01@louisville.edu (L.A.V. Dinglasan).

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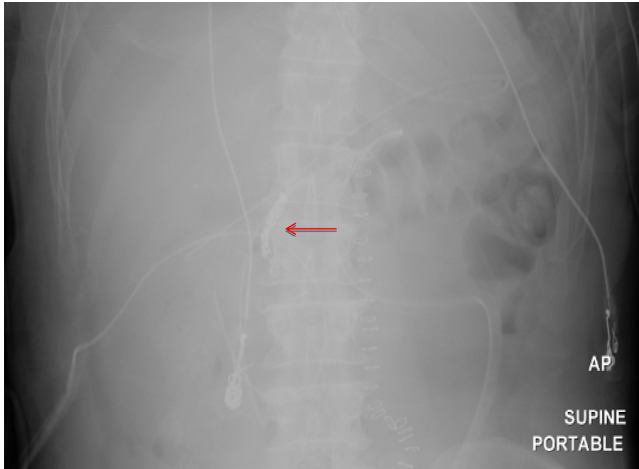


Fig. 1 – AP supine radiograph of the abdomen demonstrates the coils (arrow) post embolization in an expected location. AP, anterior-posterior.

the thoracic aorta at the isthmus with an associated mediastinal hematoma, bilateral pulmonary contusions, grade 3 liver laceration, and low-grade splenic laceration. A pseudoaneurysm arising from the GDA was seen with areas of active extravasation in the region of the pancreatic head, gallbladder, and multiple foci around the duodenal C-loop, suggesting pancreatic or mesenteric duodenal injury.

The patient was taken directly to the operating room for an exploratory laparotomy and endovascular aortic repair. Extensive electrocautery of the liver and cholecystectomy were performed. Mesenteric hematoma was seen with no signs of expansion. Extensive bleeding from a single vessel believed to be a branch of the portal vein near the junction of the head or body of the pancreas was seen, which was oversewn with 3-0 Prolene sutures (Ethicon) and hemoclips. No gross injury to the pancreas was noted. Endovascular thoracic aortic pseudoaneurysm repair utilizing a 26 mm × 10 cm GORE TAG stent (Gore) was performed. The patient was transfused with 6 units of packed red blood cells during the procedure and remained relatively hemodynamically stable with systolic pressures maintained in the low 100s mm Hg.

The immediate postoperative hemoglobin level was 9.7 g/dL, which downtrended to 5.8 g/dL the next morning. The patient remained hemodynamically stable; however, because of persistent hemoglobin drop, interventional radiology was consulted for suspicion of persistent extravasation from vascular injury to the GDA based on preoperative imaging.

Utilizing standard technique to gain access, a 5-Fr SOS catheter was used to select the celiac artery. Selective angiography was performed, demonstrating a pseudoaneurysm off the proximal GDA adjacent to its origin at the common hepatic artery. A Renegade microcatheter (Boston Scientific) and a 0.016-inch Fathom microwire (Boston Scientific) were then used to select the GDA, where embolization was performed with 9 coils. No areas of active contrast extravasation were noted on postembolization angiography. Postembolization radiography demonstrated a tight coil pack in the GDA (Fig. 1). The patient remained hemodynamically stable post procedure with the hemoglobin appropriately responding to transfusion and rising

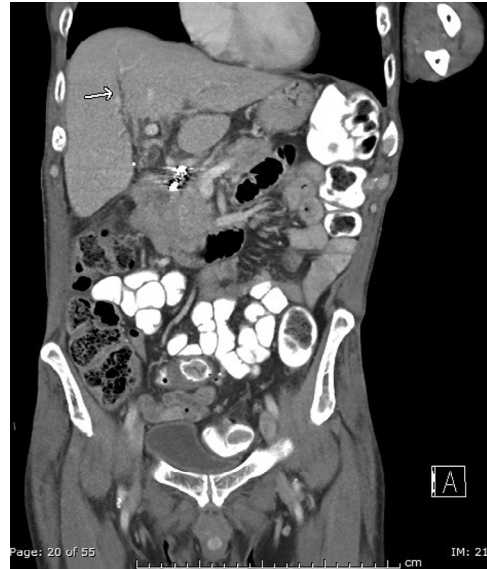


Fig. 2 – Coronal computed tomography of the abdomen and pelvis with contrast from December 2016 demonstrates an artifact caused by the coils, which appear intact, with mild intrahepatic biliary duct dilatation (arrow).

from 8.5 to 10.1 g/dL post procedure. The lipase level normalized to 34 units/L by day 3. Amylase levels 3 days after admission were elevated at 479 units/L but normalized to 79 units/L by day 6. By day 10, lipase and amylase levels had elevated again to 70 and 152 units/L, respectively, and then further increased to 100 and 207 units/L the next day. Subsequent lipase and amylase were not available for review. The patient's total bilirubin increased from 0.8 mg/dL on the day of admission to a peak of 7.3 mg/dL on day 9, but normalized by day 21. The patient was then discharged to an acute rehab facility 21 days after initial presentation.

In December 2016, the patient returned for a computed tomography (CT) of the abdomen and pelvis (Fig. 2). This demonstrated embolization coils in an expected location of GDA and no vascular abnormalities. In April 2017, the patient presented to his primary care provider's office for a routine International Normalized Ratio check and was jaundiced. Labs noted the total bilirubin level to be 6.3 mg/dL, alkaline phosphatase of 993 units/L, alanine aminotransferase of 167 units/L, and aspartate aminotransferase of 209 units/L. International Normalized Ratio was also elevated to 10.0. The patient was admitted to an outside hospital for further workup. An ultrasound demonstrated a dilation of the common bile duct (CBD), with the soft tissue density concerning for debris versus mass. Magnetic resonance cholangiopancreatography reported moderate dilation of the intrahepatic bile ducts and the CBD, with truncation of the CBD just proximal to the pancreatic head concerning for cholangiocarcinoma (Fig. 3). CT of the abdomen and pelvis demonstrated a worsening of the intrahepatic biliary ductal dilatation. A percutaneous external biliary drain was placed, improving the patient's total bilirubin level to 3.1 units/L, which was then converted to an internal-external drain (Fig. 4). Endoscopic retrograde cholangiopancreatography (ERCP) was performed, which demonstrated no stones or mass;

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