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SHORT COMMUNICATION

Bile duct obstruction following migration of coils placed for managing hepatic artery pseudoaneurysm after biliary stent placement

Obstrucción biliar luego de migración de *coils* colocados para el manejo de pseudoaneurisma de la arteria hepática posterior a la colocación de prótesis biliar

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The development of a pseudoaneurysm at the level of the hepatic artery or splenic artery is a rare complication that can be found in 0.5% of biliopancreatic surgical procedures, such as cholecystectomy,[1] or endoscopic procedures, such as metallic[2,3] or plastic[4,5] biliary stent placement. Pseudoaneurysms may be incidental findings on axial images[3] or manifest as the triad of gastrointestinal bleeding, abdominal pain, and jaundice. Treatment has traditionally been surgical, but in recent years, coil embolization has become the management of choice, with coil placement guided by radiology or endoscopic ultrasound.[6,7]

Few cases of coil migration into the bile ducts, with subsequent obstructive complications, have been reported in the literature. Such complications are primarily managed endoscopically.

A 68-year-old woman came to the emergency service, presenting with acute biliary pancreatitis, with signs of gallstones (Fig. 1a). She was referred for endoscopic retrograde cholangiopancreatography (ERCP), during which stones were extracted, and a 10 Fr plastic biliary stent was placed. Fifty-six days later, the patient presented with radiating, ''girdling'', epigastric abdominal pain and episodes of melena, as well as a 5 g/dl drop in hemoglobin. Upper endoscopy documented the presence of hemobilia. She underwent ERCP with clot cast extraction and metallic biliary stent placement.

Computed tomography (CT) angiography was performed, revealing a pseudoaneurysm in the right hepatic artery (Fig. 1b). It was successfully managed through superselective embolization, with no complications (Fig. 1c).

Fourteen months later, the patient sought medical attention due to pain in the right hypochondrium, associated with jaundice and choluria. Hepatobiliary ultrasound identified intrahepatic and extrahepatic bile duct dilation, associated with direct hyperbilirubinemia and elevated alkaline phosphatase.

The patient was diagnosed with recurrent choledocholithiasis and underwent ERCP. The preliminary x-ray revealed the presence of radio-opaque, filiform material

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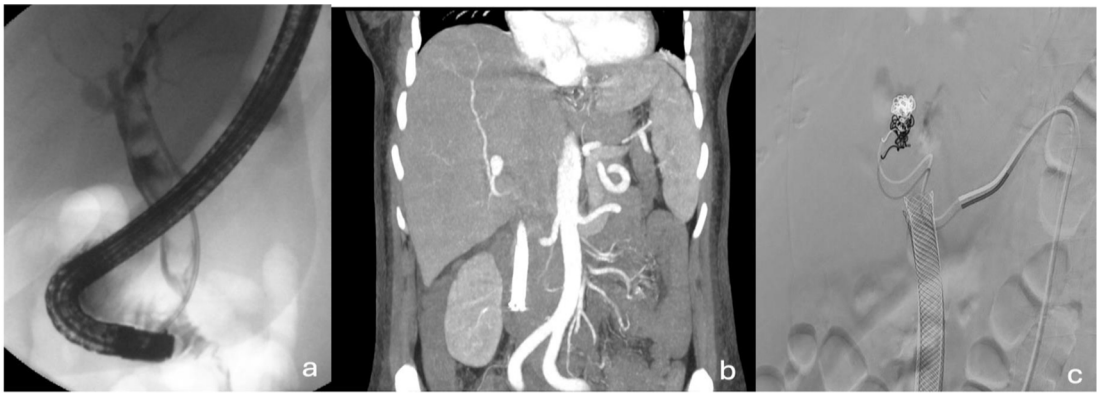

Figure 1 (a) Initial cholangiography, documenting multiple gallstones. (b) CT angiography showing the pseudoaneurysm in the left hepatic artery. (c) Super-selective coil embolization of the pseudoaneurysm in the hepatic artery.

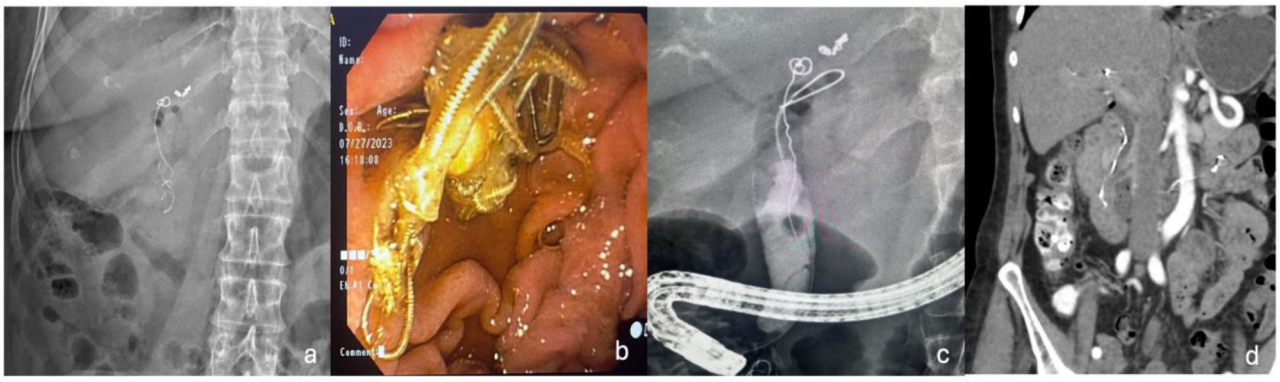

Figure 2 (a) Preliminary x-ray showing the partial migration of the embolization material into the bile duct and duodenum. (b) Endoscopic evidence of the vascular embolization metallic material in the duodenum. (c) Cholangiographic image of the gallstone associated with the material that migrated into the bile duct. (d) CT angiography ruling out flow to the level of the pseudoaneurysm after the partial migration of the material into the bile duct and up to the fourth part of the duodenum.

coming from the liver parenchyma and extending through the bile duct until reaching the small bowel (Fig. 2a). With the duodenoscope, said metallic material was identified protruding through the papilla (Fig. 2b). Cholangiography was performed that additionally revealed a filling defect inside the common bile duct, consistent with a stone (Fig. 2c). A stone extraction balloon was introduced, achieving stone removal, as well as displacing part of the metallic material from the bile duct into the duodenum.

The procedure was suspended, and CT angiography was carried out, showing there was no flow to the level of the pseudoaneurysm. Thus, the risk for a new bleeding episode after endoscopic coil extraction was considered low (Fig. 2d).

A new ERCP was performed and the material that migrated into the bile duct and the duodenum was extracted using a foreign body forceps, with no complications.

Patient progression was satisfactory one year after the procedure, with no signs of jaundice or paraclinical cholestasis and no episodes of bleeding.

The incidence of complications associated with self-expanding metallic biliary stents reaches 24%. Presentation is generally early, and the most frequent complications are cholangitis, pancreatitis, acute cholecystitis, liver abscess, bile duct perforation, duodenal perforation, and hemobilia.[3] Hemobilia has been described more frequently with the placement of plastic stents, as opposed to metallic stents. Its presentation may be secondary to periductal inflammation, following adhesion between the wall of the stent and the hepatic artery, contributing to the formation of a pseudoaneurysm.[3]

The procedure of choice for pseudoaneurysm is angiography with embolization of the entity. It is mainly performed when the pseudoaneurysm is dependent on small vessels, with no significant distal flow, and located peripherally to the hepatic hilum, with clinical success rates between 79 and 100%. It can be carried out with coils, which is the most widely used method, or with thrombin injection, gel foam, or cyanoacrylate.

The spontaneous migration of embolized material is rare and its clinical behavior is similar to that of biliary obstruction due to gallstones. Said migration occurs between one and several months after the placement of the endovascular material.[1]

The cause of migration is not clear, but mechanisms, such as inflammation, malignancy, or infection around the pseudoaneurysm that lead to the erosion of the pseudoaneurysm's wall by the coil and its migration to

other organs (in our case, the bile duct), have been proposed.[8]

The time from embolization to manifestations of migration is reported at between a few weeks and several years.

Sixty percent of coil migration cases reported in the literature present with biliary obstruction, requiring endoscopic or surgical management. Ten percent of those cases were identified as incidental findings and their expectant management, as described in some of the cases, is still a subject of debate.[8]

Ethical considerations

The author declares he has obtained informed consent from the patient to use the clinical and imaging information included in this case report, emphasizing that sensitive information and personal data will not be published. Likewise, the document was authorized for publication by the research and ethics committee of the *Fundación Santafé de Bogotá*.

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Declaration of competing interest

The author declares that there is no conflict of interest.

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