Spontaneous biliary-colonic fistula in association with biliary calculus disease

A 34-year-old male patient presented with history of right upper abdominal pain of 1 week duration. He also complained of diarrhoea for the past 2 to 3 months. He had undergone cholecystectomy 2 years ago for cholelithiasis.

Imaging Findings:

A large calculus is visualised within the proximal aspect of the left hepatic duct near its confluence with the right hepatic duct causing significant dilatation of the intrahepatic biliary radicles in left lobe of liver. Another calculus is visualised within one of the dilated intrahepatic radicles in left lobe of liver. A small calculus is also visualised in the distal common bile duct.

Significant air pockets are noted within the right hepatic duct and intrahepatic biliary radicles in right lobe of liver in keeping with pneumobilia. No air pockets are noted within the dilated biliary radicles in left lobe of liver. The hepatic flexure of colon is noted in close proximity to the inferior surface of liver with a well-defined tract connecting the right hepatic duct and the hepatic flexure of colon. The common hepatic and common bile duct could not be visualised, likely due to decompression by proximal fistula.

Discussion:

Biliary enteric fistulas comprise a rare group of disorders. Among these, cholecystoduodenal fistulas are the most common group constituting about 70 %, while cholecystocolonic fistulas constitute about 8 to 26% [1, 2]. Choledochoduodenal fistulas are extremely rare with only a few cases reported in literature. Reported associations include possible cholangitis, agenesis of gall bladder, cholangiocarcinoma, cystic duct remnant and common bile duct calculus [3, 4, 5, 6, 7]. Biliary calculus disease was also the presumed cause of fistula formation in our case. Common presenting complaints in patients with a biliary enteric fistula include abdominal pain and diarrhoea. Steatorrhoea and an increased risk of recurrent cholangitis have also been described [1, 3].

Pneumobilia detected on plain radiographs, ultrasound and CT examinations is suggestive of biliary enteric fistula formation in the right clinical setting. Barium studies and hepatobiliary scintigraphy have been used to diagnose biliary colonic fistulas in a few reported cases [3, 8]. With the advent of thin section isovolumetric images in CT and MRI it is likely that the actual fistulous communication will be visualised more often using these modalities. Our case had cholecystectomy for cholelithiasis two years prior to presentation. The calculi within the hepatic duct...
and intrahepatic biliary radicles might have been missed prior to surgery or new calculi might have formed later. It is likely that the small calculus in the distal common bile duct obstructed biliary drainage, thus facilitating formation of an alternative route of drainage through the adjacent hepatic flexure of colon. On CT, where subjects are routinely examined in supine position, air pockets in the biliary tree usually ascend into the non-dependent biliary radicles of the left lobe of liver. The presence of pneumobilia exclusively within the radicles in the right lobe of liver along with dilatation of the radicles in the left lobe of liver in our case necessitated a search for possible obstruction to the left hepatic duct and aided in confirming the location of the large calculus. This type of spontaneous biliary enteric fistula where the fistulous tract exclusively connected biliary radicles, draining only one lobe of the liver with the colon, has not been previously documented to the best of our knowledge.

Treatment is directed towards the underlying cause for the fistula, calculus disease in this case. Definitive treatment involves surgical excision of the fistulous tract with some form of anastamosis between the biliary tract and duodenum/jejunum for biliary drainage [3, 9].

Differential Diagnosis List: Biliary-colonic fistula in association with biliary calculus disease, Post surgical/post procedural pneumobilia, Lax ampullary sphincter with pneumobilia

Final Diagnosis: Biliary-colonic fistula in association with biliary calculus disease

References:
Description: Axial CT section shows pneumobilia within the intrahepatic biliary radicles in right lobe of liver. The radicles in left lobe appear dilated and fluid-filled with a calculus (black arrow) within one of these radicles. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: A large calculus (black arrow) is seen within the left hepatic duct close to its confluence with the right hepatic duct causing upstream intrahepatic biliary dilatation. Pneumobilia is seen within radicles in right lobe. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: A calculus is seen within the proximal left hepatic duct causing dilatation of intrahepatic biliary radicles in left lobe of liver. Pneumobilia is seen within radicles in right lobe of liver. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: A small calculus (black arrow) is seen within the distal common bile duct. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Significant pneumobilia with dependent fluid is seen within biliary radicles in right lobe of liver. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Pneumobilia is seen within biliary radicles in right lobe of liver. Significant dilatation of intrahepatic biliary radicles in left lobe of liver is seen. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: The large calculus in proximal left hepatic duct is faintly visualised. Pneumobilia in right lobe of liver and intrahepatic biliary dilatation in left lobe of liver are also seen. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Abnormal communication of the biliary tract with the hepatic flexure of colon is seen (black arrow). Origin: Ramnad MRI and CT Scans, Ramnad, India.
**Description:** The hepatic flexure of colon (black arrow) is seen in close proximity to the inferior surface of the liver. No abnormal wall thickening is seen in this region. **Origin:** Ramnad MRI and CT Scans, Ramnad, India.
Description: No abnormal wall thickening or mass lesions are seen in the hepatic flexure of the colon (black arrow). The gall bladder is not visualised in keeping with history of surgery. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Figure 3

Description: Coronal reformatted image showing the large calculus in the proximal left hepatic duct (white arrow). The hepatic flexure of colon (black arrow) is noted extending close to this calculus.

Origin: Ramnad MRI and CT Scans, Ramnad, India.
**Description:** An abnormal fistulous tract (black arrow) is noted connecting the biliary radicles in right lobe of liver with the hepatic flexure of colon. Significant pneumobilia is also seen in right lobe of liver.

**Origin:** Ramnad MRI and CT Scans, Ramnad, India.
Description: The abnormal fistulous tract (black arrow) between biliary radicles in right lobe of liver and the hepatic flexure of colon is well demonstrated. The fistula likely appeared at the level of the right hepatic duct. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: CT topogram image shows a faint gas-filled out-pouching (black arrow) from the hepatic flexure region of the colon extending into the right upper quadrant of abdomen. Origin: Ramnad MRI and CT scans, Ramnad, India.