PICTORIAL MEDICINE

Mycotic cystic artery pseudoaneurysm successfully treated with transcatheter arterial embolisation

An 82-year-old man was admitted to hospital for management of an acute cerebral infarct. During his rehabilitation he was given antibiotics for pneumonia. After the antibiotic treatment commenced, he developed hypovolaemic shock and fresh rectal bleeding. His haemoglobin level dropped from 102 g/L to 75 g/L. Oesophagogastroduodenoscopy found mild gastric erosion. Computed tomography (CT) revealed a distended gallbladder containing hyperdense material, suggestive of either hyperdense sludge or blood (Fig 1a). He responded well to blood transfusion, but biochemical testing showed an elevated serum alkaline phosphatase level (1064 IU/L), so another CT study was arranged. The second CT study revealed air inside the gallbladder and a small area of contrast staining in the gallbladder wall (Fig 1b). His haemoglobin level remained low, so hepatic, coeliac and mesenteric digital subtracted angiography was performed. A hepatic angiogram performed with a 5-F catheter (Cobra 1, Cook, Bloomington, US) demonstrated a pseudoaneurysm arising from a branch of the cystic artery (Figs 2a and 2b), with contrast extravasating into the biliary ductal system (Fig 2c). Embolisation of the cystic artery branch after superselective cannulation with a 2.7-F microcatheter (Progreat, Terumo, Somerset, US) was accomplished with microcoils (two 2 mm/2 cm microcoils [Cook] and three 2 mm/3 mm microcoils [Vortex, Boston Scientific, Cork, Ireland]) and 355-500 μm polyvinyl alcohol microparticles (Ivalon). The post-embolisation angiogram showed complete obliteration of the pseudoaneurysm, while the patency of the hepatic arteries was preserved (Fig 2d). The patient's condition improved after embolisation.

Discussion

A cystic artery pseudoaneurysm is a very rare complication of cholecystitis. To our knowledge, fewer than 20 cases have been reported. Although cholecystitis occurs commonly, mycotic cystic artery pseudoaneurysms are rare. This phenomenon may be explained by the observation that the cystic artery is usually thrombosed during cholecystitis rather than developing focal wall necrosis.[1] Other causes of cystic artery pseudoaneurysms include injury during surgery,[2] vascular disease such as polyarteritis nodosa[3] and a bleeding tendency.[4] Cystic artery pseudoaneurysms are prone to rupture; 45% will bleed into the biliary system and cause haemobilia.[5]

Patients with cystic artery pseudoaneurysms may present with right hypochondral pain, jaundice and gastro-intestinal haemorrhaging, a syndrome

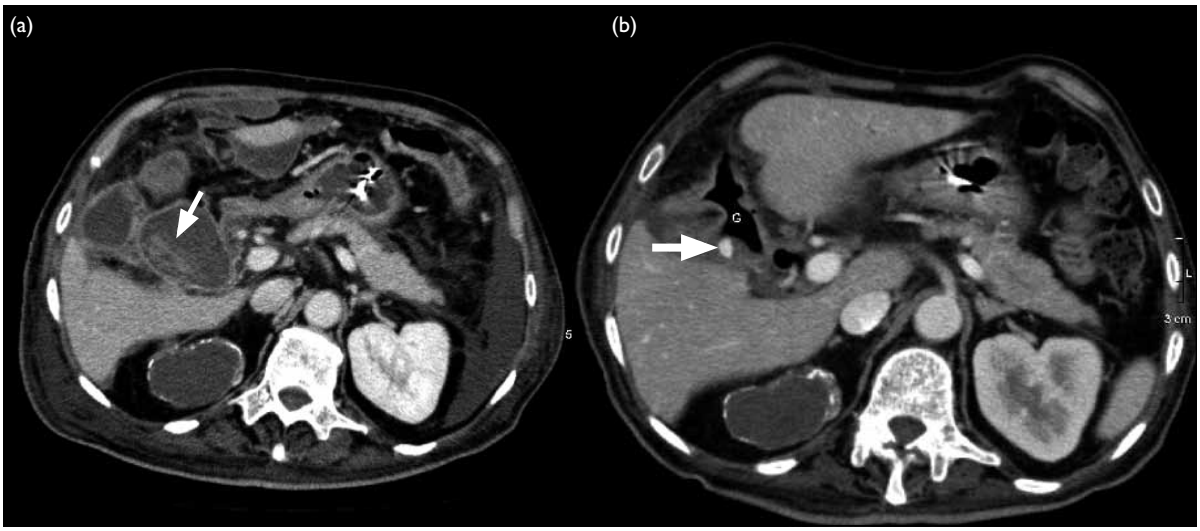

FIG 1. Contrast-enhanced computed tomographic images showing (a) the distended gallbladder containing hyperdense material (arrow), suggesting either hyperdense sludge or blood. Fluid is seen at left side of abdomen, and (b) air is noted inside the gallbladder (G). Suspicious contrast staining is noted at the gallbladder wall (arrow)

known as Quinke's triad. About 40% of these patients are anaemic. An upper endoscopy usually reveals haemobilia, and an ultrasound may show a distended gallbladder with internal echogenicity.[6] A multiphasic contrast-enhanced CT can be used to demonstrate a cystic artery pseudoaneurysm, especially so if a three-dimensional reconstruction technique is used.[7] Digital subtracted angiography allows both confirmation of the diagnosis and therapeutic intervention. Digital subtracted angiography with transcatheter arterial embolisation (TAE) is a useful method for unstable or high-risk patients as it allows an urgent operation to be avoided. The surgeon can elect to perform definitive surgery when the patient's condition has stabilised. Thrombosis of the cystic artery does not usually lead to ischaemia of the gallbladder because the gallbladder bed blood supply is usually adequate.[8] There have been no reports of gallbladder gangrene after TAE of cystic artery pseudoaneurysms. Nevertheless, because gallbladder gangrene is a potentially life-threatening complication, we consider it essential that patients be closely monitored after the procedure.

John LY Leung, MB, BS, FHKAM (Radiology)
Email: leungly@ha.org.hk
WK Kan, MB, ChB, FHKAM (Radiology)
Sunny CS Cheng, MB, BS, FHKAM (Radiology)
Department of Radiology
Pamela Youde Nethersole Eastern Hospital
Chai Wan, Hong Kong

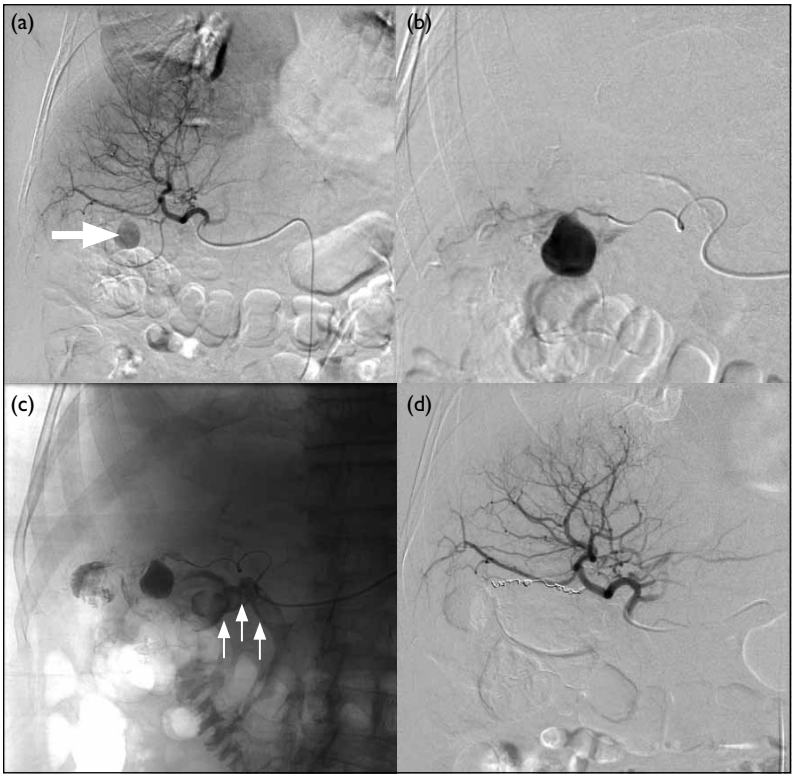

FIG 2. (a) Right hepatic angiogram shows a pseudoaneurysm (arrow). (b) Cystic artery angiogram after selective cannulation with a microcatheter confirms the pseudoaneurysm arising from the cystic artery. (c) Cystic artery angiogram shows contrast extravasating into the biliary system and the duodenum. Filling defects are seen inside the gallbladder, cystic duct and common bile duct (arrows), suggesting blood clots. (d) Post-embolisation right hepatic angiogram shows successful embolisation of the cystic artery pseudoaneurysm. The patency of the right hepatic artery has been preserved

References

1. Strickland SK, Khoury MB, Kiproff PM, Raves JJ. Cystic artery pseudoaneurysm: a rare cause of hemobilia. Cardiovasc Intervent Radiol 1991;14:183-4.
2. Moses V, Keshava SN, Wann VC, Joseph P, Sitaram V. Cystic artery pseudoaneurysm after laparoscopic cholecystectomy presenting as haemobilia: a case report. Trop Gastroenterol 2008;29:107-9.
3. Mori M, Kohzaki S, Makino K, et al. Spontaneous intracholecystic hemorrhage due to polyarteritis nodosa. J Comput Assist Tomogr 1998;22:730-1.
4. Kaafarani H, Taher A, Haddad MC, Haidar A, Mourad FH. Spontaneous intracholecystic bleeding in a patient with von Willebrand's disease. Gastrointest Endosc 2003;58:809-11.
5. Delgadillo X, Berney T, de Perrot M, Didier D, Morel P. Successful treatment of a pseudoaneurysm of the cystic artery with microcoil embolization. J Vasc Interv Radiol 1999;10:789-92.
6. Laing FC, Frates MC, Feldstein VA, Goldstein RB, Mondro S. Hemobilia: sonographic appearances in the gallbladder and biliary tree with emphasis on intracholecystic blood. J Ultrasound Med 1997;16:537-43.
7. Akatsu T, Tanabe M, Shimizu T, et al. Pseudoaneurysm of the cystic artery secondary to cholecystitis as a cause of hemobilia: report of a case. Surg Today 2007;37:412-7.
8. England RE, Marsh PJ, Ashleigh R, Martin DF. Case report: pseudoaneurysm of the cystic artery: a rare cause of haemobilia. Clin Radiol 1998;53:72-5.