Introduction

Pseudoaneurysms of visceral arteries are uncommon but well-characterized vascular abnormalities that result from atherosclerotic change, trauma or intra-abdominal inflammation; they may also result from a congenital anomaly. Pseudoaneurysms of the cystic artery caused by cholecystitis, however, have only been reported sporadically. Moreover, a right hepatic artery pseudoaneurysm that arises from evolved calculous cholecystitis is extremely rare. As far as we are aware, only 1 case has been reported in the English-language literature.

Case Report

A 73-year-old man presented with episodes of acute, right upper abdominal pain of 3 days duration. On arrival at our institution, he had a high fever of 39.2°C. He had no history of hepatobiliary disease, abdominal trauma, or abdominal surgery. Physical examination demonstrated right upper abdominal tenderness and icteric sclera. Blood analysis showed an elevated white blood cell count of 14,600/mm³, hemoglobin level of 12.9 g/dL, C-reactive protein level of 3.61 mg/dL, aspartate aminotransferase level of 161 U/L, alanine aminotransferase level of 233 U/L, total bilirubin of 6.15 mg/dL, with a direct fraction of 4.36 mg/dL, and a γ-glutamyl transpeptidase level of 385 U/L.

Non-contrast-enhanced computed tomography (CT) revealed a large gallstone in the neck of the gallbladder and a small pericholecystic fluid collection, which were suggestive of acute cholecystitis. In this case report, we describe the appearance on magnetic resonance angiography (MRA) of a right hepatic artery pseudoaneurysm associated with cholecystitis, which ruptured into the gallbladder.
Figure 2. Oblique coronal T2-weighted magnetic resonance imaging (TR: 1,393 ms; TE: 92 ms) revealed a laterally displaced gallstone (black arrow) caused by the pseudoaneurysm (thick white arrow). A low-signal-intensity material suggestive of blood clot or hemorrhage was also noted within the gallbladder and the common bile duct (thin white arrow).

Discussion

A pseudoaneurysm of the right hepatic artery caused by cholecystitis, which has ruptured into the gallbladder, is rarely encountered. To the best of our knowledge, this is the first right hepatic artery pseudoaneurysm with rupture into the gallbladder that has been demonstrated by contrast-enhanced MRA. Contrast-enhanced MRA is a useful diagnostic tool for high-accuracy vascular evaluation because there is no radiation exposure and it is minimally invasive. Although the resolution of contrast-enhanced MRA is not as high as that of conventional angiography, it is sufficient to evaluate pathological conditions in the larger vascular structures in nearly all parts of the body. As techniques improve and better understanding of parameters ensues, contrast-enhanced MRA is becoming increasingly competitive with digital angiography and contrast-enhanced CT angiography as an alternative minimally invasive method.

Our patient experienced an initial episode of acute calculous cholecystitis, and within 3 weeks, formation of a right hepatic artery aneurysm within the gallbladder lumen had occurred. The development of the
pseudoaneurysm of the right hepatic artery was so rapid that it was not seen on the previously obtained contrast-enhanced CT scan. Progressive development of the pseudoaneurysm occupied the gallbladder neck and body and displaced the large gallstone from the gallbladder neck to the fundus. The mechanism remains uncertain. The patient had cholecystolithiasis and severe cholecystitis. This suggests that bile leakage into the liver parenchyma could have occurred after the severe inflammatory reaction in the gallbladder, and the large gallstone could have eroded the wall of the right hepatic artery, thus forming a pseudoaneurysm.6

Hemobilia caused by a ruptured pseudoaneurysm in the gallbladder was suggested by T2-weighted MRI and validated by gastroscopy thereafter. Bleeding pseudoaneurysm is a rare but frequently fatal complication in patients with cholecystitis. The mortality rate of patients who harbor a bleeding visceral pseudoaneurysm is between 12.5% and 37%. If the patient is left untreated, the mortality rate becomes significantly higher (90%), because the incidence of spontaneous rupture reaches 50%.7 Nonoperative management is an appropriate treatment for vascular lesions and is indicated for patients with relatively stable hemodynamics. Successful treatment of pseudoaneurysm of the right hepatic artery, which consists of pseudoaneurysm embolization followed by elective cholecystectomy, has been reported.6 Unfortunately, sepsis with unstable hemodynamics was encountered before we could arrange embolization of the pseudoaneurysm for our patient. Embolization could have simplified the subsequent surgical procedure.

In conclusion, a case of right hepatic artery pseudoaneurysm in the gallbladder, which resulted from calculous cholecystitis, was demonstrated by preoperative MRI.

References