LETTER / Gastrointestinal imaging

Gallbladder volvulus: A rare case of acute cholecystitis

A. Gog\textsuperscript{a}, B. Robert\textsuperscript{a,*}, C. Mouly\textsuperscript{b}, M. Castier\textsuperscript{a}, C. Chivot\textsuperscript{a}, C. Gondry-Jouet\textsuperscript{a}, T. Yzet\textsuperscript{a}

\textsuperscript{a} Abdominal and Gastrointestinal Imaging Department, Medical Imaging Department, place Victor-Pauchet, 80054 Amiens cedex 01, France
\textsuperscript{b} Department of Metabolic and Gastrointestinal surgery, place Victor-Pauchet, 80054 Amiens, France

KEYWORDS
Volvulus; Gallbladder; Gangrenous Cholecystitis; Computed tomography; Emergency

Case report

A 78-year-old female patient was admitted to the emergency department with severe hypochondrial and right flank pain present for 48 hours. She had a past history of an episode of atrial fibrillation, hypertension and kyphoscoliosis. Clinical examination revealed guarding in the right hypochondrium and a painful resistant mass in the right flank. She was apyrexial. Laboratory tests showed an acute phase reaction with a leukocytosis of 23,000/mm\textsuperscript{3} and raised CRP of 323 mg/L (N < 5 mg/L). In view of the clinical and laboratory findings, she had contrast-enhanced abdominal and pelvic CT scan with an injection of iodinated contrast agent which showed severe distension of the gallbladder with defective local wall uptake, a liquid effusion around the gallbladder and cystic duct volvulus (Fig. 1). A diagnosis of gangrenous cholecystitis as a result of gallbladder volvulus was made and she had an urgent cholecystectomy. Intra-operative findings confirmed a necrotic gallbladder with 180\degree torsion of the cystic pedicle confirming the volvulus (Fig. 2). The patient improved and she left the department of gastrointestinal surgery seven days later.

Discussion

Gallbladder volvulus is a rare cause of atraumatic, acute abdomen which is often very difficult to diagnose pre-operatively. It occurs predominantly in older people with a female to male sex ratio of 3:1. A few cases have been reported in children [1–3]. The pathophysiology involves torsion of the gallbladder around the cystic pedicle. Gallbladder torsion is...
A. Gog et al.

Figure 1. Abdominal CT scan with iodinated contrast injection (portal phase) in axial sections (A,B,C) and oblique coronal reconstructions (D,E) showing a very distended gallbladder in an abnormally low horizontal position associated with an effusion around the gallbladder and defective wall uptake (head of white arrow) together with torsion of the cystic pedicle due to the volvulus (black arrow).

Figure 2. Intra-operative images confirming the diagnosis of gangrenous cholecystitis (black arrow) complicating gallbladder volvulus (short white arrow). Note the presence of a long, wide, Gross type A mesocyst (head of white arrow) after release of the gallbladder torsion.

predisposed to by two types of congenital abnormalities according to the Gross classification [4]: type A is a long wide mesocyst and type B is an incomplete mesocyst. These two anatomical variations produce a floating gallbladder appearance. Loss of fatty tissue and elasticity causing visceroptosis in the elderly, increased peristalsis in the neighboring gastrointestinal organs and kyphoscoliosis are also acquired risk factors. In our case, the patient had pronounced kyphoscoliosis with gallbladder ptosis associated with a long wide mesocyst intra-operatively. The volvulus may be complete (360°) or incomplete (180°) and may be complicated by gangrenous cholecystitis and then peritonitis if it ruptures.

The clinical presentation is a combination of severe hypochondrial and right flank pain, abdominal guarding and
occasionally a palpable painful large gallbladder. Abdominal ultrasound is the first line investigation to investigate painful diseases in the right hypochondrium. In acute cholecystitis, which complicates volvulus, the gallbladder is very distended and in an abnormally low position associated with an effusion around the gallbladder and the gallbladder walls are hypoechoic and laminated in appearance. Abdominal computer tomography (CT) with iodinated contrast injection shows the gallbladder to be horizontal and located outside of the gallbladder bed together with torsion of the cystic pedicle and a ‘‘whirl sign’’. Gallbladder distension in volvulus is often more pronounced than in acute cholecystitis due to gallstones. The gallbladder wall abnormalities are best examined by CT and show a combination of thickening and even defective wall uptake if ischaemia is present [5–9]. In our case, the choice of first line CT was guided by the patient’s medical history and the severity of her acute phase reaction, suggesting severe acute cholecystitis with a higher risk of needing to convert to surgery with laparotomy [10–12]. Multi-plane CT reconstructions also showed appearances of gallbladder torsion around the cystic duct and guided treatment by giving a diagnosis of gangrenous cholecystitis.

Treatment is surgical with urgent cholecystectomy because of the risk of gallbladder perforation. Initial release of the torsion on the gallbladder can reduce the risk of damage to the biliary tract [9,13,14].

Conclusion

Gallbladder volvulus is a rare cause of acute cholecystitis, which is occasionally difficult to diagnose pre-operatively. Ultrasound and particularly CT scans can visualize an abnormally low gallbladder position, torsion of the gallbladder pedicle and the wall abnormalities associated with gangrenous cholecystitis.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References