

Gallbladder Torsion: US, CT, and MRI Findings

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Herein, we report on US, CT, and MRI images showing the real structural changes of gallbladder torsion.

An 87-year-old woman was admitted to our hospital with acute abdominal pain. The US, CT, and MRI images revealed pericystic fluid and a distended gallbladder with an irregular structure. The gallbladder's body and fundus were located outside of the hepatic bed with a limited fixation and with exfoliation of the mucosa and constriction of the neck, indicating acute gangrenous cholecystitis (Figs. 1 and 2). We performed an emergency cholecystectomy. During the operation, we confirmed the enlarged, distended, and gangrenous floating gallbladder with greater than 360° counter clockwise torsion around the cystic duct as shown by the preoperative US, CT, and MRI images (Fig. 3).

Although gallbladder torsion is often difficult to assess pre-operatively, it is usually easy to diagnose acute cholecystitis requiring emergency surgery. However, as the typical images of this rare pathological condition have accumulated, gallbladder torsion can be accurately diagnosed. It is important to diagnose in the early phase because this condition will easily and rapidly progress, resulting in sepsis and septic shock. Some authors have reported the typical features of gallbladder torsion appearing on US, CT,

and MRI images. US findings are generally non-specific but usually indicate an enlarged gallbladder outside of its normal anatomical position with wall thickening, a three-layered structure, and pericystic fluid.¹ Typical CE-CT images have been reported as ischemic changes, a swollen gallbladder in an abnormal anatomical position indicating a “floating”, “wandering”, or “pedunculated” gallbladder with a V-shaped distortion of the extrahepatic bile ducts due to cystic duct traction, the presence of an enhanced cystic duct on the right side of the gallbladder, and a “cystic duct knot sign”. The so called whirl sign is a rare but specific CT finding.² Several signs determined by magnetic resonance cholangiography (MRC) have been reported, including a V-shaped distortion of the extrahepatic bile duct, a twisting and tapering interruption of the cystic duct, gallbladder deviation to the midline, and different intensities of the gallbladder, extrahepatic bile ducts, and cystic duct. MRI findings include a high-intensity area within the gallbladder wall on T1-weighted images, suggesting haemorrhagic infarct and necrosis such as submucosal haemorrhage. T2-weighted images indicate necrosis of the gallbladder wall.

In our case, the US images were reviewed and a “knot”-like hyperechoic nodular appearance of the torted cystic duct close to the gallbladder neck was clearly apparent, which is called the “cystic duct knot sign”.³ The US images were also compatible with those of the CT and MR findings. If gall bladder torsion is suspected in patients presenting with the clinical manifestations of acute cholecystitis, this rare condition should be assessed using US for a complete and accurate diagnosis.

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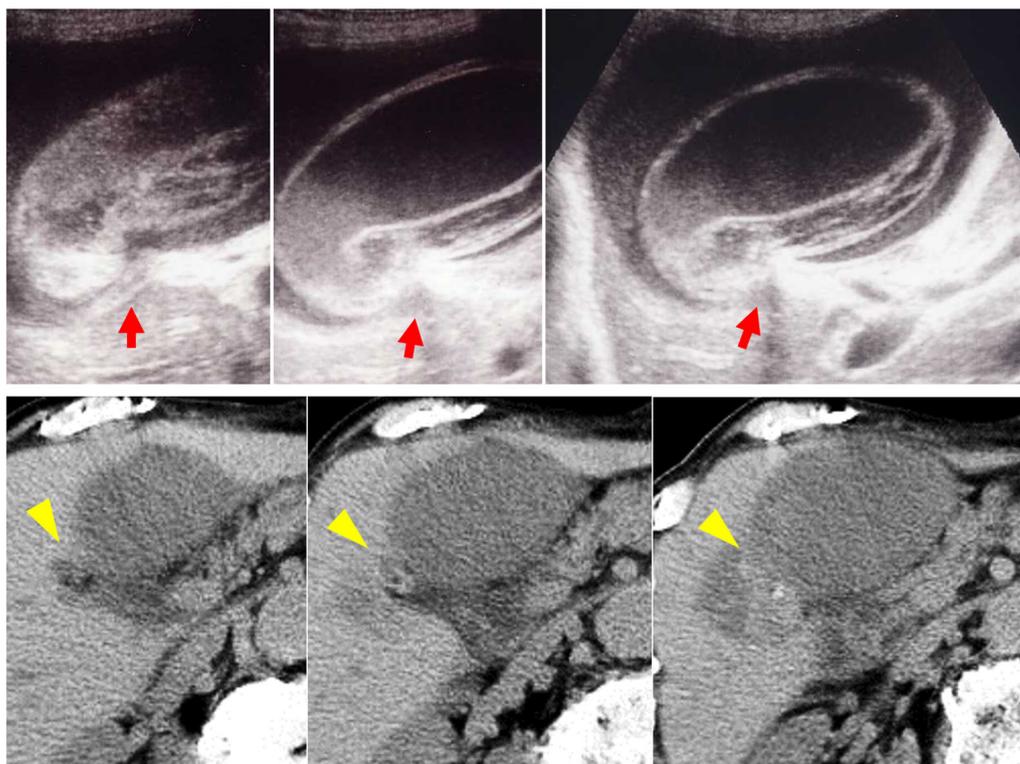


Fig. 1 US and CT findings; US images showing twisting of the cystic duct and traction of hepatoduodenal ligament (upper series), and CT images showing a swollen gallbladder and its fundus was displaced below the midline (lower series)

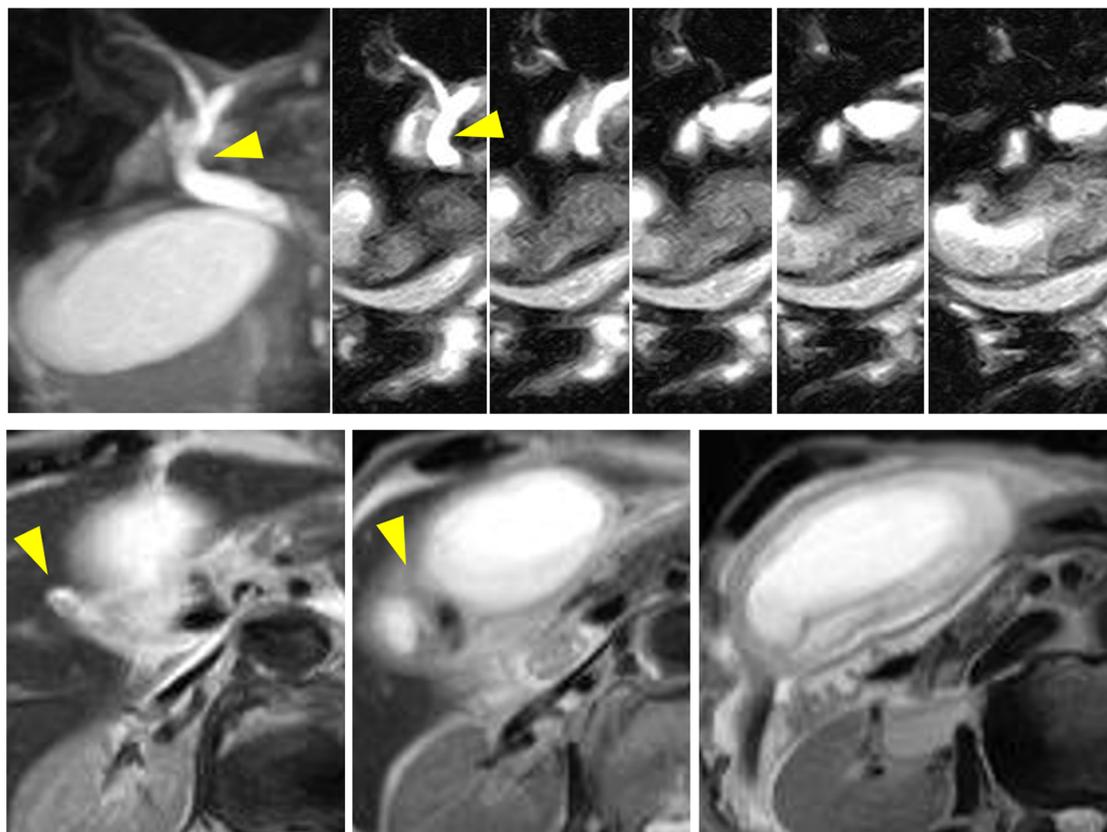


Fig. 2 MRC and T2-weighted MR findings; MRC images showing tapering of the cystic duct and interruption (arrow) and he extrahepatic bile duct exhibits a V-shaped distortion (arrow head, upper series), and MR images showing thickening of the gallbladder wall and pericystic fluid collection (lower series)

Fig. 3 Intraoperative findings and resected specimen: dark-red swollen floating gallbladder that was twisted by greater than 360° in a counter clockwise rotation (left upper photograph and lower schema), and limited attachment of the gallbladder from the liver bed, which brought torsion (right)



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