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Detecting Emphysematous Cholecystitis Using Plain Radiograph

IMAGE

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A 68-year-old woman was referred to the hospital with a 3-day history of intermittent abdominal pain in the right upper quadrant and nausea without vomiting. Her medical history was insignificant, other than the presence of hypertension. On admission, her blood pressure was 140/94 mmHg and her body temperature was 36.7°C. A physical examination revealed abdominal tenderness in the right upper quadrant, a negative Murphy's sign, and abdominal distention. Laboratory reports indicated a white blood cell count of 18.13×10^3/μL with 92.6% neutrophils, a C-reactive protein level of 273.8 mg/L, and total bilirubin and liver enzyme levels within normal limits. Plain abdominal radiography images showed a pear-shaped hyperlucency in the supine position (Fig. 1a) and illustrated an air-fluid level in the gallbladder in the erect position (Fig.1b). Notable distention of gas-filled bowel loops was visible in both images. Subsequent computed tomography (CT) revealed gallbladder distention with wall thickening, pericholecystic fat stranding, and intraluminal and cystic duct air (Fig. 1c). The patient was diagnosed with emphysematous cholecystitis (EC) with a paralytic ileus and an urgent laparoscopic cholecystectomy was performed. No gallstone was found in the resected gallbladder or evidence of abnormal communication with the gastrointestinal tract. The postoperative course was uneventful. Histopathological findings indicated extensive gangrene and necrosis in the gallbladder wall.

EC is a rare variation of acute cholecystitis (1). The diagnosis is confirmed with the detection of air in the lumen, gallbladder wall, and occasionally, in the bile ducts. Most cases of EC are caused by thrombosis or occlusion of the cystic artery with ischemic necrosis of the gallbladder wall and subsequent infection caused by gas-forming pathogens (2). This is histopathologically different from acute cholecystitis, which is caused by cholelithiasis obstructing the gallbladder neck. EC has a high incidence of gangrene and perforation of the gallbladder, resulting in a mortality rate of >15% (1). However, the symptoms of patients with EC are often non-specific and may initially be indistinguishable from those of simple acute cholecystitis (2). Moreover, gas formation and gangrene may lead to rapid denervation of the gallbladder wall and a positive Murphy's sign may not be present. While CT imaging is the most sensitive method to facilitate a diagnosis of EC, careful interpretation of characteristic radiographic findings of air in the anatomical position of the gallbladder can be very helpful to arriving at the correct diagnosis (3).

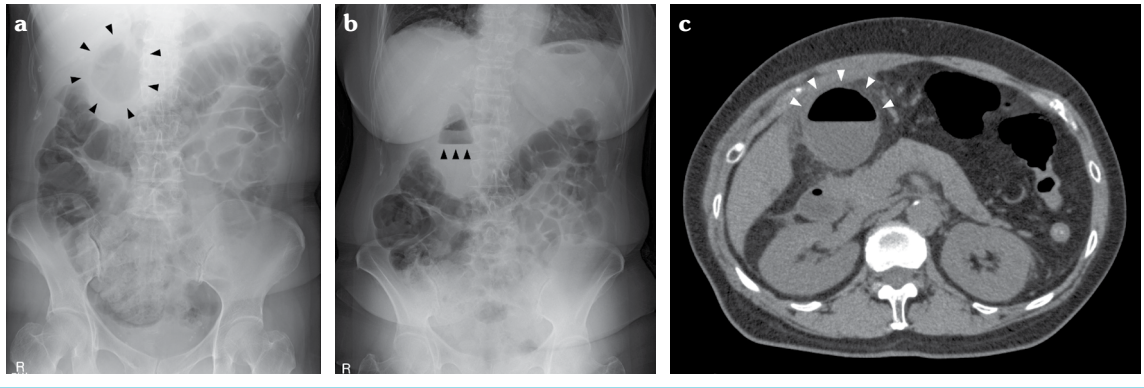

Figure 1. Plain abdominal radiographs taken in the (a) supine and (b) erect position demonstrating a pear-shaped hyperlucency (a, black arrowheads) and the air-fluid level of the gallbladder (b, black arrowheads) in the right upper abdomen. Plain abdominal computed tomography axial plane view image demonstrating distention of the gallbladder with wall thickening, pericholecystic fat stranding, and intraluminal air (c, white arrowheads)

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