An Unusual Case of Intra-Abdominal Air

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Question: A 52-year-old man with a history of hypertension and diabetes mellitus was admitted because of right upper abdominal pain of 3 days’ duration. He complained of nausea, abdominal fullness, and fever. He also noted that his skin had become yellow and his urine tea-colored. His symptoms were not made worse by eating and were unaffected by postural change.

On physical examination, the patient was in acute distress. The temperature was 38.6°C, the pulse rate 104 bpm, the blood pressure 98/57 mm Hg, and the respiratory rate 30 breaths per minute. The abdomen was soft and mildly distended, with tenderness in the right upper quadrant. The Murphy's sign was positive, but there were no peritoneal signs. There was no operation scar, palpable mass, or organomegaly. The remainder of physical examination was unremarkable. Laboratory studies revealed leukocytosis with shift to the left (white blood cell count, 24,090/µL; segmented neutrophils, 76%; and band forms, 6%). The serum aspartate aminotransferase was 411 IU/L, alanine aminotransferase 663 IU/L, gamma glutamyl transpeptidase 160 IU/L, alkaline phosphatase 230 IU/L, and serum bilirubin total/direct 10.3/7.5 mg/dL. Plain abdominal radiography revealed a radiolucent halo in the right upper quadrant of the abdomen (Figure A).

What is your diagnosis?

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Abdominal computed tomography revealed gallstones with an air-fluid level in the gall bladder, gas accumulation in the gall bladder wall, and air in the retroperitoneal space (Figure B, C, arrowheads). Emergent exploratory laparotomy and cholecystectomy were performed. Histologically, transmural necrosis with diffuse neutrophil infiltration, hemorrhage, and gas-containing spaces were present in the gallbladder wall (Figure D). Emphysematous cholecystitis was diagnosed. Culture of the bile yielded *Clostridium perfringens*. The patient recovered without sequelae after operative intervention and antibiotic treatment.

Emphysematous cholecystitis is one of the lethal gas-forming infections within the abdomen and pelvis, with reported mortality rate as high as 15%-25%. Most cases are associated with diabetes mellitus and peripheral atherosclerotic disease. Delay in making the diagnosis, sometimes because of obscure initial manifestations, may lead to severe complications, such as perforation of the gallbladder and pneumoperitoneum. In this case, the plain abdominal radiograph was typical of emphysematous cholecystitis, and abdominal computed tomography is required to evaluate the extent of severity of this uncommon disease. Emergent exploratory laparotomy and cholecystectomy are mandatory in the presence of intra-abdominal free air.

In conclusion, emphysematous cholecystitis is an uncommon cause of pneumoretroperitoneum. The life-threatening condition needs prompt diagnosis and treatment, especially in patients with comorbidities such as diabetes.

**References**