



Ultrasound in Emergency Medicine

HEMORRHAGIC CHOLECYSTITIS: A CASE OF EXPEDITED DIAGNOSIS BY POINT-OF-CARE ULTRASOUND IN THE EMERGENCY DEPARTMENT

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Abstract—Background: Hemorrhagic cholecystitis is a rare complication of acute cholecystitis and is a potentially fatal diagnosis. It may be difficult to detect because the symptoms are similar to more common diagnoses. Point-of-care ultrasound is a useful imaging technique in the emergency setting and is readily available to allow for immediate interpretation and application of the results to guide medical decision making. **Case Report:** We report a 76-year-old man with a history of hypertension, hyperlipidemia, diabetes, atrial fibrillation on warfarin, and coronary artery disease presenting with epigastric pain radiating to the back, nausea, and vomiting who was found to have hemorrhagic cholecystitis with gallbladder perforation. Ultrasound of the abdominal right upper quadrant showed a large, hyperechoic, nonshadowing, globular structure visualized within the lumen of the gallbladder extending from the neck through the body. The gallbladder wall was noted to be 0.72 cm with wall edema, focal pericholecystic fluid, and a positive sonographic Murphy sign suggestive of acute cholecystitis. The abnormal appearance of the gallbladder contents was suspected to be blood. Computed tomography angiography was performed and confirmed the diagnosis of acute hemorrhagic cholecystitis with perforation. Blood was noted to track from the cystic duct to the gallbladder lumen. **Why Should an Emergency Physician be Aware of This?:** To our knowledge, this is a unique case of hemorrhagic cholecystitis visualized on bedside ultrasound. This case shows that the use of point-of-care ultrasound by emergency medicine providers can facilitate the rapid recognition and treatment of specific, life-threatening hepatobiliary pathology while excluding alternate diagnoses. © 2019 Elsevier Inc. All rights reserved.

Keywords—acute cholecystitis; bedside ultrasound; biliary pathology; cholecystitis; emergency medicine; emergency ultrasound; hemorrhagic; POCUS; point-of-care ultrasound; ultrasound

INTRODUCTION

The acute abdomen requires rapid and specific diagnosis because several etiologies demand urgent operative intervention, and undue delay in diagnosis and treatment may adversely affect outcome (1). Hemorrhagic cholecystitis can be easily overlooked because its symptoms mimic more common hepatobiliary pathology presenting with right upper quadrant (RUQ) pain, a positive Murphy sign, and leukocytosis (2). Point-of-care ultrasound (POCUS) is a useful imaging technique that is commonly used in the emergency department (ED) that is inexpensive and readily available in the setting of acute abdominal pain. It can help to reduce the number of possible differential diagnoses by exclusion or by displaying the actual diagnosis. Hemorrhagic cholecystitis carries a high morbidity and mortality rate, particularly when it is complicated by perforation, necrosis, or potentially massive hemorrhage (3). Prompt identification using POCUS at the bedside can facilitate urgent surgical intervention.

CASE REPORT

A 76-year-old man with a history of hypertension, hyperlipidemia, diabetes, atrial fibrillation on warfarin, and coronary artery disease presented to the ED with a 1-day history of epigastric pain radiating to the back, nausea, and vomiting. The patient described the pain as severe, constant, and worse after eating. On arrival to the ED the patient had a heart rate of 110 beats/min, blood pressure of 98/57 mm Hg, and was febrile (100.5°F). His physical examination was significant for a positive Murphy sign with guarding but no rebound. He had normal peripheral pulses and equal bilateral blood pressures.

POCUS of the abdominal RUQ, obtained with a Sonosite X-Porte curvilinear C6-2 probe (Sonosite, Bothell, WA), revealed a large, hyperechoic, nonshadowing, globular structure visualized within the lumen of the gallbladder extending from the neck through the body. The gallbladder wall was noted to be 0.72 cm with wall edema, focal pericholecystic fluid, and a positive sonographic Murphy sign, suggestive of acute cholecystitis (Figures 1–3). The patient was immediately started on broad spectrum antibiotics and a surgical consult was placed. The abnormal appearance of the gallbladder contents was suspected to be blood. Computed tomographic angiography was performed and confirmed the diagnosis of acute hemorrhagic cholecystitis with perforation. Blood was noted to track from the cystic duct to the gallbladder lumen. The patient was found to have a white blood cell count of 26.86 k/ μ L, a total bilirubin of 1.8 mg/dL, aspartate transaminase of 332 U/L, alanine aminotransferase of 178 U/L, a lipase of 7761 U/L, and an international normalized ratio of 4.3. The patient was admitted to the surgical intensive care unit; however, his blood pressure became more labile and he was deemed to be too unstable for emergent cholecystectomy. Anticoagulant reversal agents were administered, and the patient was brought to interventional

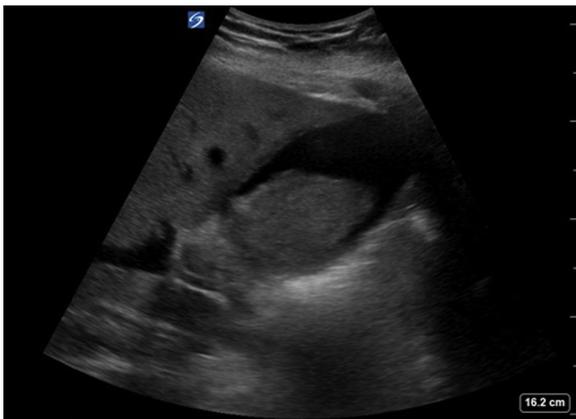


Figure 1. A large, hyperechoic, nonshadowing, globular structure visualized within the lumen of the gallbladder extending from the neck through the body.



Figure 2. The gallbladder wall was noted to be 0.72 cm with wall edema.

radiology where he had the successful placement of an 8-Fr percutaneous cholecystostomy tube. The interventional radiologist noted that blood was aspirated from the gallbladder lumen during the procedure. Specimen samples were sent for culture and sensitivity from which *Escherichia coli* grew. The patient made a good recovery and was discharged from the hospital 7 days later.

DISCUSSION

Acute cholecystitis is a common disease that accounts for 5% of ED visits for abdominal pain and 3% to 9% of hospital admissions for the same complaint (4). Gallstones are a common etiology of acute cholecystitis in >90% of patients (5). Impaction of the stones in the cystic duct or gallbladder neck causes an obstruction accompanied by luminal distention and inflammation, ultimately leading to necrosis of the gallbladder. Acute cholecystitis may present with many different complications, including hemorrhagic cholecystitis, which is rare and carries a high morbidity and mortality. It usually develops in the setting of cholelithiasis and gangrenous cholecystitis (6).



Figure 3. Focal areas of pericholecystic fluid suggestive of gallbladder wall perforation.

Transmural inflammation causes mural necrosis and ulceration and results in hemorrhage into the lumen of the gallbladder (6). Clots can form inside the gallbladder that may distend it and contribute to gallbladder perforation into the abdomen. Gore et al. stated that the clinical presentation of hemorrhagic cholecystitis “may be identical to uncomplicated acute cholecystitis with fever and RUQ pain but may also include biliary colic, jaundice, hematemesis, and melena” (6). Perforation is less common but is associated with a mortality rate of approximately 30%. The clinical presentation of gallbladder perforation includes sudden transient relief of RUQ pain related to decompression of a distended gallbladder, followed by signs of generalized peritonitis (7). Other causes of hemobilia without associated cholecystitis include anticoagulation use, biliary neoplasms, and vascular abnormalities, such as an aneurysm and trauma. On ultrasound, blood in the gallbladder lumen is visualized as hyperechoic material that has a greater echogenicity than sludge. Depending on the state of the blood it may appear as layered, clumped, or adherent to the gallbladder wall (8). Clues to perforation of the gallbladder on ultrasound are the deflation of the gallbladder, with loss of its normal gourd-like shape, and a focal pericholecystic fluid collection (9). A more specific finding is a focal defect in the wall of the gallbladder, although it may not always be visualized.

Definitive treatment for cholecystitis is a cholecystectomy, while a percutaneous cholecystostomy can be performed for acute management in patients with significant comorbidities. In our case, the patient was too unstable for emergent cholecystectomy and underwent placement of an 8-Fr percutaneous cholecystostomy tube by interventional radiology.

WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?

POCUS used in the setting of abdominal pain has been shown to expedite the care of patients presenting

with possible biliary disease and decrease the duration of stay in the emergency department (10). Imaging is essential to tailor further management, and a delay may cause a loss in the window of opportunity for timed and quality decision making. Although there is minimal documentation of the use of POCUS in hemorrhagic cholecystitis specifically, there is extensive evidence of its utility in diagnosing acute cholecystitis (11). Our unique case of hemorrhagic cholecystitis identified on POCUS demonstrates that emergency physicians can use bedside POCUS to expedite the diagnosis and prompt management of rare cases of biliary pathology.

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