In patients at risk for healthcare-associated infections, Staphylococcus aureus (S. aureus) is a rare, but possible causative agent of cholecystitis. To date, a review of the English literature revealed 10 cases of acute cholecystitis with S. aureus considered to be the etiologic bacteria. We report a case of a 67-year-old woman with end-stage renal disease (ESRD) on hemodialysis with acute cholecystitis caused by S. aureus bacteremia.

A 67-year-old woman presented to the emergency room with a three-day history of malaise and abdominal pain. She reported right mid-quadrant pain with chills, occasional nausea, and multiple episodes of non-bilious emesis. Her past medical history was significant for ESRD on hemodialysis, diet controlled diabetes, and a hospitalization six months prior for methicillin-resistant staphylococcus aureus (MRSA) bacteremia associated with hospital-acquired pneumonia. The infection was treated for 2 weeks with vancomycin resulting in symptomatic and clinical resolution.

On admission, her temperature was 100.8°F in the emergency room after a measured temperature of 102°F taken in hemodialysis. Her abdomen was tender in the right upper and right lower quadrants. Laboratory studies were significant for a white blood cell count of 34.5 x10⁹ cells/L with 92% neutrophils.

A computerized tomography scan of the abdomen showed 2 large stones in the gallbladder and wall thickening suggesting cholecystitis. A subsequent ultrasound of the abdomen showed 2 large impacted stones at the neck of the gallbladder with wall thickening measuring 1.1 cm as well as a dilated common bile duct measuring 9 mm. Positive sonographic Murphy’s sign was elicited. Due to the concern of acute cholecystitis, the patient was started on intravenous piperacillin-tazobactam and vancomycin. Blood cultures obtained on admission grew gram positive cocci in clusters twenty-four hours later, and on hospital day 3 the bacteria was identified as MRSA. On hospital day 4, an endoscopic ultrasound was performed and showed a slightly tortuous bile duct 0.7 cm in diameter with no gallstones or strictures noted in the bile duct. An echocardiogram obtained to assess for acute infective endocarditis found mild aortic regurgitation with aortic annular calcification, but no intracardiac vegetations or masses. Because of her septic appearance, an exploration of the right upper quadrant and biliary tract was performed. Laparoscopic surgery was attempted to remove the gallbladder, however an open cholecystectomy was eventually performed. The gallbladder specimen showed acute suppurative and chronic cholecystitis with cholelithiasis. Post-operatively, the patient expired. Bile collected from the gallbladder at the time of surgery grew out light S. aureus.

S. aureus is a ubiquitous bacterium in both healthy and immunocompromised patients, but it is especially dangerous in patients on dialysis. Current United States data reports that up to 65% of hemodialysis patients are colonized with MRSA. Diabetes is another independent risk factor. S. aureus is the leading pathogen responsible for 27-39% of severe infections in dialysis patients. The mortality rate for S. aureus bacteremia in dialysis patients is 8%.

The most likely primary source of cholecystitis was S. aureus seeding the gallbladder hematogenously. The patient had a history of hemodialysis, a risk factor for S. aureus bacteremia, and had been bacteremic from pneumonia in a previous hospitalization. The delay in surgery while other possible sources of infection were investigated had significant prognostic indications for this patient.

Although uncommon, physicians should consider S. aureus as a potential etiologic agent of acute cholecystitis in patients exposed to health care environments. Identifying affected patients and proceeding with aggressive and timely medical and surgical interventions will be crucial and potentially lifesaving. We still adhere to the traditional principle of directing empiric coverage towards the common enteric bacteria given the rarity of S. aureus infection in the biliary tract. However, patients with multiple risk factors for S. aureus infection who present with acute cholecystitis deserve special management considerations.
Acknowledgments: The authors wish to thank Dr. Geraldine E. Ménard and Dr. James E. Brown for their thoughtful review of the manuscript. There was no financial support given for this study. The authors have no conflicts of interest.