**CLINICAL VIGNETTE**

# A Case of Subhepatic Abscess with Serratia Ficaria after Emergent Laparoscopic Cholecystectomy

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*Serratia ficaria* was first described in 1979 by Grimont et al.[1] This bacterium is an aerobic, non-spore-forming, motile, catalase-positive, oxidase-negative, gram negative rod that belongs to *Serratia* species from Enterobacteriaceae family. This organism has been found in the fig trees, figs, and in the specific fig pollinator wasp *Blastophaga psenes* (*B. psenes*).[1]

This article describes a case of *S. ficaria* in a previously healthy man, which resulted in a subhepatic abscess following an emergent laparoscopic cholecystectomy.

A 59-year-old previously healthy Italian-American man with no significant past medical history presented with several weeks of RUQ abdominal pain. He was diagnosed with acute cholecystitis and underwent emergent cholecystectomy. The patient continued to have right upper quadrant pain, which progressively worsened with severe pain, especially with deep inspiration. One month following surgery, he developed colicky abdominal pain, in addition to his ongoing right upper quadrant pain, and subsequently presented to the Emergency Department. Abdominal computed tomogram (CT) showed a renal stone, a 9 mm retained gallstone within the common bile duct, or gallbladder fossa, and a 3 mm area of hypodense fluid collection versus mass adjacent to inferior aspect of the right lobe of the liver. Since he remained afebrile, he was diagnosed with renal colic and discharged home. However, the patient presented to his primary physician 3-4 months later with continued right upper quadrant pain. His primary physician was concerned about the previously noted fluid collection and noted leukocytosis of 18,500/μL. Repeat abdominal CT scan showed the fluid collection had increased to 8 cm and was suspicious for a liver abscess. The patient was admitted and started on intravenous ciprofloxacin and metronidazole after blood cultures. The fluid collection was aspirated by interventional radiology on the following day and grew *Serratia ficaria* at 48 hours. Blood cultures remained negative. Metronidazole was discontinued, and the intravenous ciprofloxacin was changed to oral ciprofloxacin. The patient remained stable and ambulatory throughout his hospital stay. He continued to report mild right upper quadrant pain, which worsened with deep inspiration and deep palpation. His leukocyte count fluctuated between 10,000 to 17,000/μL with a left shift, and he was discharged home on oral ciprofloxacin to complete a total course of 4 weeks of antibiotic therapy.

The patient returned to the emergency department with colicky abdominal pain and hematuria and was treated for nephrolithiasis. Abdominal CT was obtained and the formal CT report showed re-accumulation of the subhepatic fluid. The patient was contacted and readmitted for aspiration of the fluid collection. Infectious Diseases recommended intravenous ertapenem. Under ultrasound guidance 25 mL of purulent fluid was aspirated and a drainage catheter was placed. Repeat CT showed an additional fluid collection in the right posterior inferior subhepatic space. A second drainage catheter was placed and 12 mL of purulent fluid was again aspirated and sent for cultures. The first drain stopped draining after 3 days and was removed. The second drain produced 7 mL of fluid before it stopped draining and was removed. Gram stain showed polymorphonuclear leukocytes but no organisms and both aerobic and anaerobic cultures remained negative. Surgery was consulted for a retained, infected gallstone and initially recommended continued antibiotic therapy. However, following several more weeks of intravenous antibiotics, the fluid collection had again increased in size. General Surgery was re-consulted, and following placement of another drain for surgical guidance, the patient was taken to the operating room and a well-formed, encapsulated abscess with fibropurulent material was removed along with an infected gallstone in the subhepatic fossa. The patient received several additional weeks of intravenous ertapenem and made an excellent recovery. Cultures of the resected abscess were negative.

***Discussion***

*Serratia ficaria* has been previously reported in three patients with gallbladder empyema in France.[2,3] An additional case of intraabdominal sepsis was also reported in 1998 from a French patient.[2,3] To date, no other similar infections have been reported. T. Anahory et al.[1] described the relation between *Serratia ficaria*, figs, fig trees, and the epidemiology of disease in 1998. The fig tree is a dioecious species. The male fig tree produces inedible figs (caprifigs) and is host to a specific pollinator wasp (*B. psenes*), which breeds in these trees. Each year, there are two generations of *B. psenes*, in May, July, August, and September. The second generation pollinates the female figs, which ripen and are edible by October. This is the case for wild fig trees (wild *F. carica*) and cultured fig trees (like *F. carica* - Smyrna variety known as calimyrnia in California).[1] *S. ficaria* has been isolated from fig trees, figs, and the pollinator wasps, which can fly several kilometers, thereby spreading the organism to the grass, mushrooms, and ants surrounding the trees.[1]

On further questioning, our patient denied eating any figs prior to his illness but remembered that as a child, his mother baked cakes and cookies from figs, which he liked. He did acknowledge having a Californian fig tree with edible figs in

his backyard. He also remembered trimming the tree two months prior to his initial illness. Shortly after, he became ill and underwent his initial surgery two months later. Interestingly, the timing of this patient's illness overlaps the time period when the 2nd generation of *B. psenes* is known to pollinate the female fig trees.

Although *S. ficaria* strains have been isolated from humans, their clinical significance is often unclear. The role of this organism as a human pathogen has infrequently been documented in case reports including the following:

1. Several cases of gallbladder empyema in immunocompetent and immunocompromised patients in France.[2]
2. One case of septicemia in a gastric cancer patient.[3]
3. A case of endophthalmitis.[4]
4. Infected leg ulceration.[5]
5. Isolation of S. Ficaria from sputum and Trachial fluid in patient with respiratory distress.[6]

On review of these cases, one can conclude that the organism has the potential to cause severe infection such as deep abscess or septicemia and play a significant pathogenic role. However, in most of the case reports the infection is mild with low pathogenicity, and usually not as complicated as was observed in our patient. Although this patient's course was prolonged and required an open surgical procedure to resolve the infection, the patient did not have severe symptoms and remained largely afebrile throughout the course of his infection. Blood cultures were negative, and all follow-up liver aspirations (following the initial aspirate) were also culture-negative despite being purulent in nature. The ongoing intravenous antibiotic therapy may have been responsible for the subsequent negative cultures.

In our patient, the liver aspirate was collected by interventional radiology and inoculated directly to aerobic and anaerobic blood culture bottles (Becton, Dickinson and Company, Sparks, Maryland) and delivered to the microbiology laboratory. Bottles were incubated and monitored for growth in the microbiology laboratory's Bactec 9240 Blood culture analyzer, and the aspirate was concentrated by cytocentrifugation and gram stained. The gram stain revealed 1-2 gram-negative bacilli and greater than 30 polymorphonuclear leukocytes X 1000 field. After approximately 13 hours, the bottles turned positive and were subcultured to blood, MacConkey, and chocolate agar plates and gram stained. The gram stain demonstrated gram-negative bacilli. After overnight incubation, growth on the subculture plates revealed a non-lactose fermenting, oxidase negative gram-negative bacillus that was later identified as *Serratia ficaria* by the laboratories Vitek2 analyzer (Biomerieux, Inc., North Carolina).

The genus *Serratia* sp. is a gram-negative, oxidase-negative bacillus and is a member of the Enterobacteriaceae family. Though not usually a cause of primary infection, they are often colonizers and can become nosocomial pathogens. Prior to the advent of miniaturized commercial biochemical, systems that allow for the inclusion of a wide array of biochemical substrates were not easily differentiated. Today, however, the Vitek2 system with its 47 different substrates includes 7 of the 8 known genera in its database and is capable of identifying all of these with a high degree of accuracy. The organism in question was typical of the species and achieved a probability quotient (likelihood that the identification was correct) of 99%.[7]

***Conclusion***

S. Ficaria has very low pathogenicity but has the potential to cause severe infection such as deep abscess or septicemia. S. Ficaria is more prevalent in the area were figs grow, like France and California.

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*Submitted July 19, 2016*