

# Clinical Vignette: Splenic Abscesses

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## ABSTRACT

This is a case report on a 51 year old female who was found to have a splenic abscess which failed percutaneous drainage medical therapy, and ultimately required a splenectomy. She presented multiple times over seven years with complaint of recurrent abdominal pain. Investigations and work-up of her most recent presentation of abdominal pain revealed a single splenic abscess that, over the course of three months, seeded within her spleen to become multiple splenic abscesses. The differential diagnosis included Crohn's disease, tuberculosis, and other unknown causes. The gold standard for treatment of splenic abscesses is a splenectomy; however, recent studies have shown success using different approaches based on abscess characteristics.<sup>1,2</sup>

## CASE HISTORY

A 51 year old female with a known history of Crohn's Disease presented to the Emergency Department with abdominal discomfort localized to the left upper quadrant (LUQ). The discomfort was described as an aching pain of 8/10 severity, periodically radiating to the back. The pain had been present 2-3 days before clinical presentation and had become progressively worse. Associated symptoms included nausea, vomiting, and fever. There was a reported change in bowel habits with loose but non-bloody stools.

Relevant history included investigations for possible exacerbation of Crohn's disease three months previously, which were inconclusive. An abdominal ultrasound at that time revealed a solitary, multiloculated splenic collection measuring 2.0 cm x 0.9 cm x 1.6 cm. The patient was diagnosed with a splenic abscess and it was drained percutaneously under ultrasound guidance. The management plan was antibiotic therapy of amoxicillin and clavulanic acid. Response to treatment was monitored through monthly abdominal ultrasounds, which revealed a continual decrease in abscess size.

The past medical history included a diagnosis of Crohn's

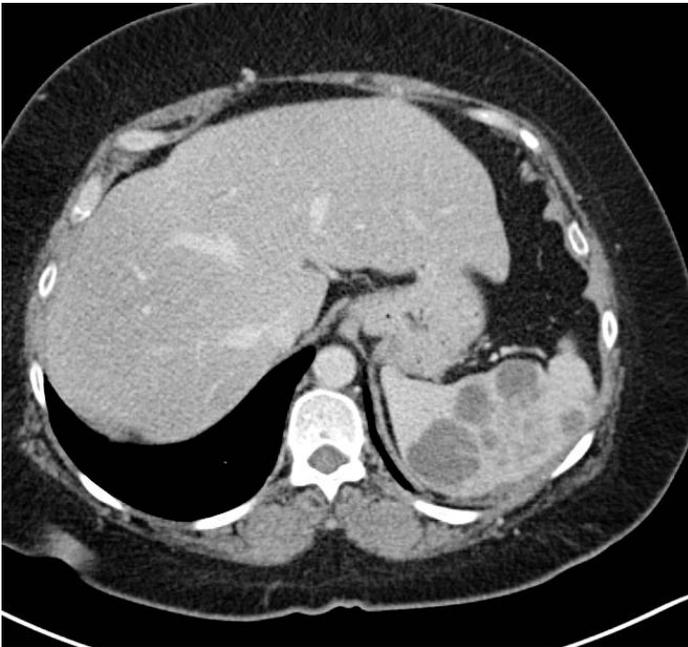
disease seven years previously, although this was not firmly established. Gastroenterological investigations included an unremarkable esophogastroduodenoscopy and multiple colonoscopies with biopsies, which were suggestive of Crohn's disease. Biopsies of the terminal ileum had shown acute and chronic inflammation with focal cryptitis. Biopsies of the right colon had revealed chronic inflammation suggestive of Crohn's disease. Biopsies of the left colon and rectum were normal. Although the changes were non-specific, the differential diagnosis included Crohn's disease, as well as chronic infections such as tuberculosis. A clinical diagnosis of Crohn's disease was made and management consisted of prednisone, mercaptopurine, and 5-ASA, to which the patient responded well. At the time of the most recent presentation, the patient was only on mesalamine.

During physical examination the patient was tachycardic with a pulse of 108 but afebrile. The abdominal exam revealed a soft abdomen with tenderness in the LUQ and localized voluntary guarding. The lower border of the spleen was palpable. The remainder of the exam was normal.

Laboratory examination revealed a white count of 19.5 x 10<sup>6</sup> /L, (absolute neutrophil count of 16.5 x 10<sup>6</sup> /L), hemoglobin of 116 g/L and platelets of 433 x 10<sup>6</sup> /L. The serum electrolytes and serum creatinine were normal as was the liver biochemistry apart from a slightly elevated GGT of 82 IU/L (normal < 55 IU/L). Blood cultures were negative. Radiologic investigations included an abdominal ultrasound that revealed an increase in size of the previous splenic abscess, and the interval development

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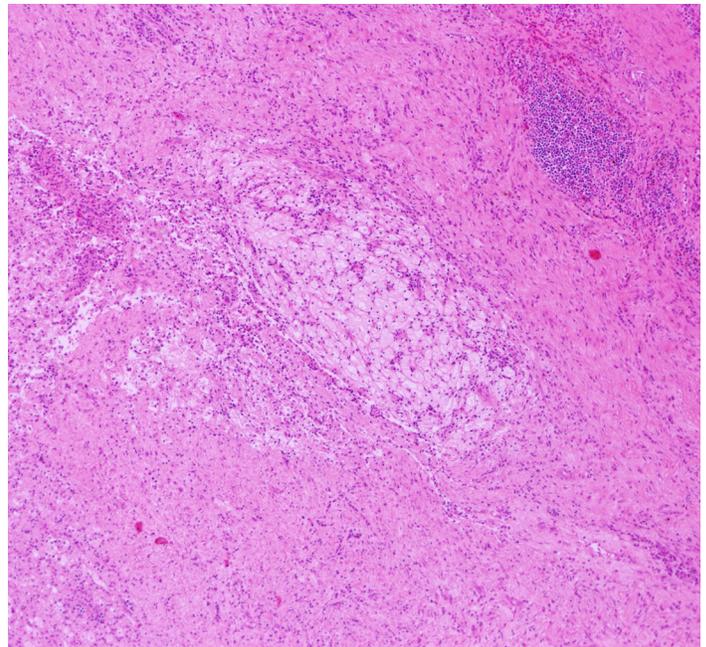
**Figure 1.1.** Multiple multiloculated splenic abscesses.

of three other splenic lesions, the largest of which measured 2.8 cm. Abdominal CT (Figure 1.1) with contrast confirmed the multiple splenic abscesses seen on ultrasound and revealed a 1 cm hypodense lesion with stranding in the surrounding mesentery that was interpreted to be either a mesenteric panniculitis or an early mesenteric abscess.

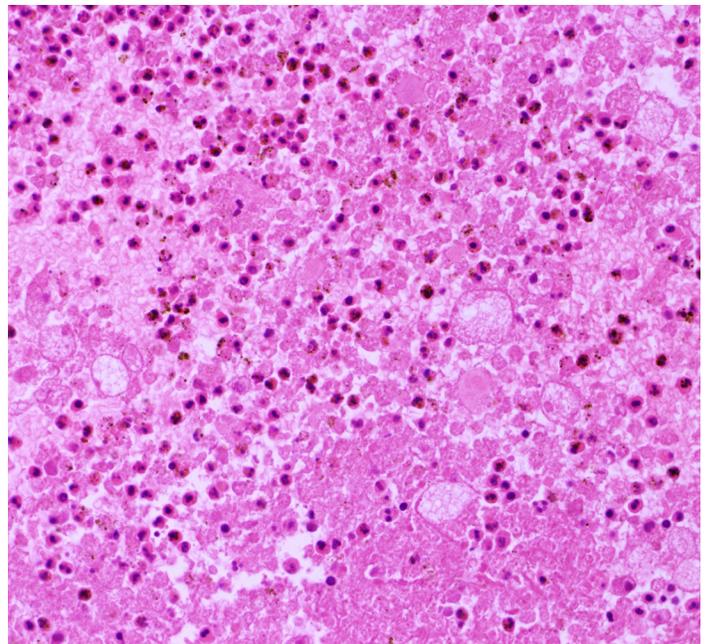
The patient was admitted to the Gastroenterology Service for the management of the splenic abscesses. It was postulated that the original source of the abscess was from a contiguous diseased segment of jejunum secondary to Crohn's disease. The Infectious Disease Service was consulted and medical management consisted of parenteral ciprofloxacin and metronidazole, broad spectrum antibiotics, until therapy could be tailored based on culture results. The patient continued to have episodic fevers, and serial diagnostic imaging did not reveal any improvement. The patient was inoculated with the pneumococcus and meningococcus vaccine, and the General Surgery Service was consulted. She underwent an uneventful splenectomy and was eventually discharged. The resected spleen revealed geographic necrosis and multiple areas of giant cells with mixed inflammation. There were areas of fibrosis with foamy histiocytes, as well as palisading histiocytes, supporting evidence of granulomas (Figure 2.1, Figure 2.2). Polymerase chain reaction (PCR) testing for *M. tuberculosis* DNA on a sample of the spleen was negative. Staining for acid fast bacilli and for fungal species was also negative.

## CASE DISCUSSION

Splenic abscesses are uncommon with an incidence at autopsy of 0.14-0.70%.<sup>1,3</sup> There is a bimodal age distribution. Peak incidences are between ages 30-40 and 60-70 years; males and females are equally affected.<sup>1,3</sup> Approximately 2/3 of splenic abscesses in adults are solitary and 1/3 are multiple. In children the opposite holds true – the majority are multiple and the minority are solitary.<sup>4</sup> Mortality



**Figure 2.1.** Geographic necrosis. (Spleen)



**Figure 2.2.** Necrotic debris and polymorphonuclear leukocytes. (Spleen)

rates are high and vary with immune status and type of abscess; there is up to 80% mortality in immunocompromised patients with multilocular abscesses and 15% mortality in immunocompetent patients with unilocular abscesses.<sup>5,6</sup> The classic triad of findings for a splenic abscess is fever, left upper quadrant pain and splenomegaly.<sup>6</sup> However, the clinical presentation is often vague and non-specific: abdominal pain, pleuritic chest pain, fevers, nausea and vomiting are all initial symptoms that cause patients to seek medical attention.<sup>1</sup> Localization of the pain to the left upper quadrant and splenomegaly are reported in less than half of the cases.<sup>1</sup> Combining the non-specific presentation with the rarity of a splenic abscess makes this a potentially fatal diagnosis that is

easily missed without appropriate investigations.

It is important to understand which patient populations are at risk for development of a splenic abscess and the pathophysiology as to why splenic abscesses develop. The splenic arteries are end arteries which progressively branch without the development of collateral channels. This renders the tissue they supply vulnerable to ischemia if they are damaged. When the flow to these arteries is compromised, the spleen becomes ischemic and necrotic. A nidus for infection is created.

There are four major risk factors which raise clinical suspicion. The first is that the most common cause of a splenic abscess is a result of hematogenous seeding from other sites of infection. The two most common sites are the heart in endocarditis, and direct introduction of bacteria into the blood with Intravenous Drug Use (IVDU). It is postulated that the incidence of splenic abscesses is increasing due to the increasing incidence of IVDU.<sup>1,2,7</sup> The second is patients who suffer trauma to their spleen. Subsequent ischemia creates an environment for bacteria to grow.<sup>1,2</sup> One must

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consider overt trauma through external forces, or microscopic trauma due to hemoglobinopathies. Third, splenic abscesses can develop from a contiguous focus of infection, such as a pancreatic or subphrenic abscess, or from adjacent infected segments of bowel as was originally hypothesized in our patient. Lastly, common to development of all infections, are patients who are immunocompromised because of the Human Immunodeficiency Virus (HIV) infection or diabetes mellitus.<sup>1,2</sup>

There is no single common organism responsible for abscess formation; the infecting organisms in splenic abscesses vary depending upon the underlying cause. *Streptococcus sp.* and *Staphylococcus sp.* have been the most cultured organisms within the past century, which is in keeping with endocarditis being the most common cause of splenic abscess.<sup>1,3</sup> Mycobacterium and fungal isolates are increasingly more common, as theorized to be due to increasing numbers of immunocompromised patients.<sup>1,3,5</sup>

Splenic abscesses are best imaged by abdominal CT with contrast. An abscess is an area of low density in the normally homogenous spleen. Abdominal CT with contrast has a 96% sensitivity compared with 76% sensitivity of abdominal ultrasound.<sup>3,6</sup> Abdominal ultrasound is limited by the operator and may be affected by overlying loops of bowel. Abdominal ultrasound findings include areas of decreased echogeneity. Images may show a gas pattern within the hypoechoic area.

Poor prognostic indicators for splenic abscesses are Gram negative bacilli, an Acute Physiology and Chronic Health Evaluation II (APACHE) score greater than 15, and multiple splenic abscesses.<sup>8</sup>

One must know the treatment options for patients diagnosed with a splenic abscess. The gold standard for treatment of a splenic abscess is splenectomy.<sup>1,8</sup> However, recent reports of subtotal splenectomies (performed open or laparoscopically) for distal splenic abscess(es) have shown success and have allowed for preservation of splenic immune function.<sup>6,9</sup> Other treatment options include antibiotic therapy with radiologically guided drainage of the abscess (either as fine needle aspirate (FNA) or placement of a percutaneous drain (PCD)) with success being reported anywhere from 50-90%.<sup>1</sup> The decision to proceed with a splenic resection or a radiologically guided drainage is dependent upon abscess characteristics. Abscesses that are unilocular have successfully been treated with ultrasound guided drainage.<sup>1</sup> This is done through FNA if the abscess is less than 50 mm or PCD if the abscess is greater than 50 mm.<sup>10</sup> Ultrasound guided drainage is also an option for patients deemed high risk for surgery.<sup>10</sup> Of note, there has been one reported case of definitive treatment using endoscopic ultrasound with transgastric drainage.<sup>2</sup> Indications to proceed to splenic resection includes failed attempt at drainage or multiple abscesses. Our patient failed her initial treatment of percutaneous drainage with antibiotic therapy and further developed multiple, multiloculated splenic abscesses. Current literature supports the decision to undergo a splenectomy. Future direction of research can focus specifically on patients with Crohn's disease and investigate common organisms, characteristics, causes and locations of abscesses to guide treatment options. 

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