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CASE REPORT

Septic Shock Secondary to Emphysematous Splenic Abscess

Saad Jawaid[1] and Wajeeha Ali Khan[2]

Authors Affiliation

Dept. of Emergency Medicine Shifa International Hospital[1]

Shifa College of Medicine, STMU, Islamabad.[2]

Correspondence to

Dr. Saad Jawaid, Resident, Department of Emergency Medicine, Shifa International Hospital, Islamabad.
E-mail: saad_jawaid@hotmail.com

ABSTRACT

Splenic abscess is rarely encountered nowadays, and the most common predisposing factor is bacteremia. Classically, endocarditis is seen to be associated with splenic abscess but any cause of bacteremia, ranging from enteric fever to intravenous line infection, to urinary tract infection may result in a splenic abscess. Since urinary tract infection (UTI) is common in females and bacteremia complicating this infection is frequently seen which has the potential to cause a splenic abscess. Here, we present a case of septic shock secondary to emphysematous splenic abscess caused by Escherichia coli (E. coli) bacteremia complicating urinary tract infection (UTI). It was presented in the emergency department with a complaint of abdominal pain associated with fever and vomiting and was diagnosed with the help of ultrasound and computed tomography (CT) scan of the abdomen. The patient was initially managed with intravenous antibiotics and subsequently, splenectomy was performed.

KEYWORDS

Splenic abscess, Escherichia coli, Septic shock.

INTRODUCTION

Splenic abscess is a rare condition and has 0.14 to 0.7 percent incidence rate on autopsy. [(1)] Bacteremia secondary to infective endocarditis is the most common cause of the splenic abscess. Other sources being urinary tract infection, surgical wounds, gastrointestinal infection and line infection with the immunocompromised state are also important predisposing factors . Organisms most commonly involved are Streptococci, Staphylococci, Salmonellae, and Escherichia coli. [(2)] There is 100% mortality if left untreated[(3)], and with appropriate management, mortality is 0-14%. [(2)] The case we are presenting is a case of emphysematous splenic abscess presented as a septic shock due to Escherichia coli bacteremia complicating urinary tract infection and was managed successfully with splenectomy and intravenous antibiotics.

CASE SUMMARY

A 55 years old female with a past medical history of diabetes, hypertension and triple vessel coronary artery disease with 40% ejection fraction visited emergency department with a 10-day history of abdominal pain associated with vomiting and fever for 1 week. The pain was gradual in onset, generalized, continuous, and dull in character, no aggravating or relieving factors and started developing fever, nausea, and vomiting after three days of onset of pain. Fever was about 100°F and relieved by taking antipyretic with intermittent bouts of nausea and vomiting. Vomitus usually contained food particles with no blood. On examination, the patient was confused, hypotensive with a blood pressure of 85/40mmHg, heart rate of 110/min, respiratory rate of 28/min, the temperature of 99.4°F and oxygen saturation of 95% on room air. Abdominal examination revealed tenderness in the epigastrium and left hypochondrium with no guarding, rebound tenderness or organomegaly and audible bowel sounds. The laboratory analysis included a complete blood count with differential, basic metabolic panel, C-reactive protein (CRP), serum lipase, cardiac profile, venous blood gas, plasma lactic acid, urine routine examination, urine culture, and blood culture. Laboratory workup revealed an elevated white cell count (WBC) of 43,700/µL with a left shift, elevated CRP of 213.80 mg/L, raised serum creatinine of 1.54 mg/dL and urine routine examination showed positive nitrite, leucocyte-esterase with significant RBC and WBC/HPF. The rest of the laboratory analysis was within normal limit. A central line was placed and normal saline (NS) fluid bolus was given but the patient did not respond to fluid resuscitation, so, was started on vasopressor (norepinephrine) infusion to maintain mean arterial pressure. Intravenous broad-spectrum antibiotics piperacillin/tazobactam and vancomycin gave after taking blood and urine culture.

Given marked abdominal tenderness, X-ray abdomen performed but it did not reveal any pathology, so ultrasound abdomen and pelvis did which showed air containing collection measuring 77×51×96 mm in the left subdiaphragmatic region concerning intra-abdominal abscess, so, general surgery team was taken on board. Due to raised serum creatinine, computed tomography (CT) scan of abdomen and pelvis without contrast was performed which revealed large fluid and air containing collection in the spleen measuring 9.6×7.2×10 cm (TR×AP×CC) with mild perisplenic stranding, reaction and mesenteric nodularity concerning for splenic abscess. The patient was admitted in surgical step-down and interventional radiology was also consulted for percutaneous drainage of abscess but after considering the size of abscess, splenectomy was performed after 24 hours of pre-operative optimization. Operative findings were enlarged spleen with perisplenitis, omentum forming adhesions with spleen and pus collection in the perisplenic region. Spleen specimen was sent for histopathology and collected pus for culture and sensitivity. Urine, blood, and pus culture all showed heavy growth of Escherichia coli (E. coli) sensitive to piperacillin/tazobactam, so, it was continued. Histopathology report was consistent with splenic abscess and was negative for malignancy. The patient was shifted toward on the 9th postoperative day and then discharged from hospital on the 12th postoperative day.

DISCUSSION

Abscess of the spleen is rarely encountered nowadays with the reported incidence of up to 0.7% on autopsy[1] and less than 800 clinical cases are reported worldwide.[4] It has male predominance with bimodal distribution in the third and sixth decade of life.[4] It is uncommon in immunocompetent people. Conditions which lead to bacteremias like endocarditis, intravenous line infections, gastrointestinal infections, urinary tract infections with an immunocompromised state like diabetes mellitus and immunosuppression are the predisposing factors. Its incidence is increasing due to an increased percentage of immune-compromised patients while underreporting leads to fewer cases in the South Asian region.[5] Streptococci, Staphylococci, Salmonella, and Escherichia coli have been the major causative agents of splenic abscess in the past century. However, with the increased number of immunocompromised patients, recent series have shown greater numbers of fungal isolates, including Candida spp., Aspergillus spp., and agents of mucormycosis. It has a mortality rate of up to 14% with treatment and 100% if left untreated.[2, 3] The cause of splenic abscess in our patient was complicated urinary tract infection caused by Escherichia coli. The patient presented in septic shock.

It is always a diagnostic challenge due to non-specific signs and symptoms. Patient rarely presents with a classical triad of fever, left upper quadrant pain and splenomegaly. They usually present with symptoms of generalized abdominal pain, fever, nausea, vomiting, anorexia, weight loss, and left-sided chest or shoulder pain. Fever is usually present and is seen in 90% of patients[6] with abdominal tenderness usually generalized and sometimes localized to left upper quadrant. On complete blood count, 88% shows leukocytosis[6] and raised CRP. Therefore, diagnosis mainly depends upon appropriate imaging modalities. Plain radiographs are not very useful as they show nonspecific findings like basilar infiltrates, pleural effusion, elevated diaphragm or gas. On the other end, ultrasonography is the initial modality of choice in patients with suspected splenic abscess as it has high sensitivity ranging from 75 to 93%. It shows an area of decreased or absent echogenicity, splenomegaly or gas pattern in the lesion.[7] Contrast-enhanced computed tomography is the single most sensitive modality in diagnosing splenic abscess, it has a sensitivity of greater than 90%[7] and appears as an area of low-density fluid or necrotic tissue with rim enhancement in few cases.

In our case, the patient presented with non-specific symptoms of fever associated with generalized abdominal pain and vomiting. On examination, she had tenderness in the left upper quadrant with no organomegaly. Initial laboratory findings showed raised CRP and WBC with a left shift. Considering abdominal tenderness and raised inflammatory markers abdominal radiography and ultrasonography were done, the x-ray was inconclusive, but the ultrasound showed air containing collection in the left subdiaphragmatic region concerning intra-abdominal abscess. For further evaluation, non-contrast computed tomography of abdomen and pelvis was done due to raised creatinine which revealed large fluid and air containing collection in the spleen.

There are three different modalities for treatment of splenic abscess; antibiotic alone, percutaneous drainage along with antibiotic and splenectomy with appropriate antibiotic cover. Traditionally, splenectomy was considered the gold standard for the treatment but now it has been questioned by many recent studies and showed that conservative management (antibiotic with or without percutaneous drainage) is possible in 80% of cases[8], while remaining cases who failed to respond to conserva-

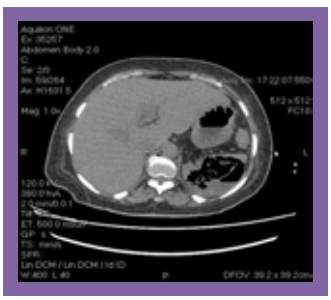

Figure 1

Figure 2

tive management or having large abscess size >10cm, splenectomy is considered the treatment of choice. In our case, splenectomy was preferred due to the large abscess size.

CONCLUSION

Splenic abscess is a rare condition but can lead to serious complications like septic shock accounting for high mortality rate if remain undiagnosed. Hence, early diagnosis based on a high index of suspicion on physical examination supported by laboratory and radiological findings is crucial.

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