

## Case report

# A rare case of coexisting emphysematous splenic abscess and renal pyelonephritis in a diabetic patient

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## Abstract

Emphysematous splenic abscess coexisting with renal pyelonephritis is a rare entity. In this scenario, a 55-year-old woman presented to us with 20-day history of left-upper-quadrant abdominal pain, vomiting, dysuria and intermittent fever with chills. There was no previous history of illness or trauma, but was known diabetic non-compliant to treatment. On admission, her white-cell count, neutrophil percentage, C-reactive protein level, blood glucose, and urine glucose were elevated. Computed tomography (CT) of abdomen showed air-fluid levels and infection in the spleen, along with pyelonephritis of left kidney. Multidisciplinary team was consulted and the patient was diagnosed with emphysematous splenic abscess, pyelonephritis and diabetic ketoacidosis with acute kidney injury. The patient was treated with intravenous fluids, antibiotics, insulin infusion and transabdominal splenic puncture and drainage. Also, the patient's infection and blood sugar were controlled, and the drainage fluid was sent for analysis. On searching literature, emphysematous splenic abscess has been reported in obese female patient in 2007. Also, the patient in our case was also obese, diabetic and middle-aged woman. Due to involvement of multidisciplinary team, imaging modalities and clinical suspicion, the patient was successfully managed.

**Key words:** Emphysematous splenic abscess, pyelonephritis, Diabetes

## Introduction

Emphysematous infection results in life-threatening conditions in which carbon dioxide, nitrogen, and other gases, released from bacterial metabolism, fill the parenchyma of solid organs. This form of sepsis can affect various organs which include stomach, intestine, liver, kidney, gallbladder, urinary bladder, and even the spleen<sup>1-3</sup>. Some bacteria, namely *Escherichia coli*, consume nutritional components in circulation, and produce gas, in hyperglycemic states<sup>4</sup>. The resulting infection and gas-induced dilation produce symptoms, such as fever and pain. Here, we present an unusual case of a splenic gas-forming infection in a woman with uncontrolled diabetes. Also, the possible pathogenesis and treatment strategies to stress the link between diabetes and the infection will be discussed.

## Case report

A middle-aged obese (BMI-38KG/M<sup>2</sup>) woman, 55 years old, presented to casualty with a 20-day history of left-upper quadrant abdominal pain, vomiting, dysuria and intermittent fever with chills. On further probing, she denied any previous history of illness or trauma, but was known diabetic since 5 yrs (Tab Metformin 500mg bd and Tab

Glimepiride 2mg bd),non compliant to treatment. On admission, she was dehydrated,had acidotic breathing with white cell count  $23.5 \times 10^9 /L$  (normal range:  $4-11 \times 10^9 /L$ ), a neutrophils-81% (normal range: 40–70%), C-reactive protein- 61 mg/L (normal range: 0–3 mg/L).Serum creatinine was elevated(1.6mg/dl) and liver function tests were normal. Her blood glucose was 38.2 mmol/L, and urine glucose and ketone bodies were qualitatively +++++. Arterial blood gases showed severe metabolic acidosis(PH-7.02,bicarbonate-6meq/l) and serum electrolytes were normal.Based on clinical suspicion,contrast enhanced computed tomography abdomen was ordered(after serum creatinine was normal) and it showed air-fluid levels , infection in the spleen and focal pyelonephritis of left kidney.Initially,she was treated IV fluids ,antibiotic therapy and IV insulin infusion.Later multidisciplinary team(Radiologists,Surgeons,Gastroenterologists and urologists) was consulted and splenic abscess puncture catheter drainage was done,after taking informed consent and fluid sent for bacterial culture. Also, enterography was done to rule out sepsis from perforated digestive tract.Multidisciplinary team also opined that this unusual infection of the spleen and kidney was caused by diabetes.Laboratory results yielded Escherichia coli in the drainage-fluid .After 14 days of antibiotics and diabetic treatment, the patient was discharged with abdominal drain in situ with stable vitals. After 1 month, she was followed up with investigations and her total counts were normal, sugars were controlled, and a CT abdomen indicated that infection of spleen and kidney were resolved.

### Discussion

In day to day practice, gas is observed in entities such as fistula, sterile infarction, leakage from adjacent viscera,gas gangrene and procedure related adverse events, which can be managed by supportive treatment<sup>5</sup>.Every attempt should be made for early diagnosis and timely management of septic emphysematous infections within the abdomen or pelvis<sup>6-7</sup>. A case of emphysematous spleen infection has been reported once in a obese female patient in 2007<sup>8</sup>. In our case,the patient was also obese and diabetic middleaged female.These splenic gas forming infection could be attributed to complications of diabetes and as similar cases were unusual, we tend to miss emphysematous splenic infections<sup>6</sup>.Hence we should thoroughly take patient's history and specifically enquire about taking diabetic treatment and are they compliant to treatment.

Also, Obesity and diabetes are major causes of morbidity in the present developed world<sup>9,10</sup>. Further, various studies have shown that obese are prone to gut dysbiosis due to altered gut microbiota and damaged mucosal barriers<sup>11,12</sup>. Escherichia is the most abundant bacteria colonising in healthy human bowel. In pathological conditions, the gut contents leak and result in bacterial translocation to organs, such as the spleen, via mesenteric vessels and portal veins<sup>14,15</sup>. The underlying diabetes predisposes to spread of Escherichia coli,which is further favoured by associated microangiopathy<sup>13</sup>.

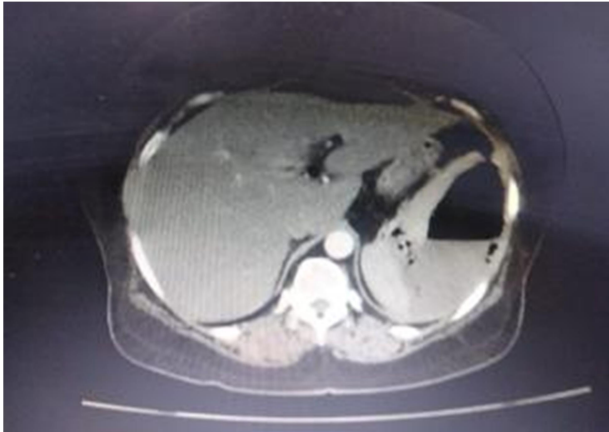
Spleen is an integral component of reticuloendothelial system and is responsible for debris removal and blood cell storage<sup>16</sup>. The location of the infection in spleen is rare. The immune-defense mechanism of spleen limits infection.In present case, CT-guided drainage was done, and antibiotics were administered which steadily controlled the infection in 1 month.

### Conclusion

Management of diabetes and its complications is of paramount importance, as is aggressively controlling septicemia associated with emphysematous infections.Role of multidisciplinary team( medical,surgical) and high

index of clinical suspicion for emphysematous infections in diabetic patients cannot be overemphasized as were it not for the timely interventions of our team, this infection could have easily disseminated into septic shock, and thus an inevitable high rate of mortality. Also, regular follow-up examinations are needed for monitoring visceral infection recurrence and diabetic complications.

**FIGURE 1:** CECT abdomen showing organized pocket of splenic collection with air-fluid level suggestive of splenic abscess.



**FIGURE 2:** CECT abdomen also showing focal altered enhancement at upper and mid pole of left kidney suggestive of pyelonephritis.



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