International Surgery Journal
Raju TRSP et al. Int Surg J. 2021 Aug;8(8):2503-2505
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20213157

Case Report

Splenic abscess presenting as a case of pneumoperitoneum: a rare presentation

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Received: 26 May 2021
Accepted: 30 June 2021

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ABSTRACT

Pneumoperitoneum is more pathognomonic of ruptured hollow viscera which requires urgent surgical intervention. But uncommon surgical entities may present with pneumoperitoneum. Splenic abscess is a relatively rare medical condition that results from bacteraemia. Pneumoperitoneum in a ruptured splenic abscess is very uncommon and is often misdiagnosed as a perforation. Spontaneous rupture of splenic abscess is a life-threatening emergency mandating early surgical intervention. We report a case of ruptured splenic abscess which presented with peritonitis and pneumoperitoneum, managed successfully by splenectomy.

Keywords: Splenic abscess, Ruptured splenic abscess, Pneumoperitoneum. Acute abdomen, Splenectomy

INTRODUCTION

Hollow viscus perforation is the most common cause for pneumoperitoneum. But there are certain uncommon entities which cause pneumoperitoneum, ruptured splenic abscess being one such unique cause that carries high mortality rate. The incidence of splenic abscess in some autopsy series was found to be approximately 0.2 to 0.7%.[1] Pneumoperitoneum due to ruptured splenic abscess is a unique surgical condition. Bacteraemia is the most common cause for splenic abscess that can occur in patients with comorbidities like immunocompromised state, trauma, hemoglobinopathy, splenic infarction, contiguous or metastatic infection, or neoplasm. Presentation of a splenic abscess includes classical triad of fever, left upper quadrant tenderness and leucocytosis but is encountered only in one third of patients. Due to this non-specific presentation, the diagnosis of splenic abscess is clinically challenging.[2] These patients may present very rarely with free gas under diaphragm.[3] Even though there are controversies regarding the best management strategies for splenic abscess, percutaneous drainage shows 67 to 100% success rates as per recent studies.[4] However, definitive management includes splenectomy in non-resolving cases with failed medical management and in case of ruptured abscess. We are reporting a surgical surprise in a young female who presented with pneumoperitoneum due to ruptured splenic abscess.

CASE REPORT

A 20 year old female presented to the surgical emergency with complaints of high-grade fever associated with chills and rigors for 15 days. Seven days later, the patient developed progressive left hypochondrial pain that later became diffuse. It was associated with abdominal distention and vomiting for past two days. Patient had no significant past history or comorbid conditions. Clinically patient was febrile, drowsy and dehydrated with tachycardia, tachypnoea and features of hypovolaemia. Per abdominal examination revealed distended, tense abdomen with diffuse guarding and absent bowel sounds. Per rectal examination was non-contributory.

Routine haematological investigations were suggestive of leucocytosis (22,000/mm^3) with anaemia (7 mg/dl). Erect radiograph of abdomen showed subphrenic free gas suggestive of pneumoperitoneum (Figure 1). Ultrasonography of abdomen revealed hypoechoic collection with internal echogenic foci in splenic parenchyma and peri splenic space with surrounding omental and mesenteric thickening. Patient was tested negative for COVID 19 and associated cytokine storm.

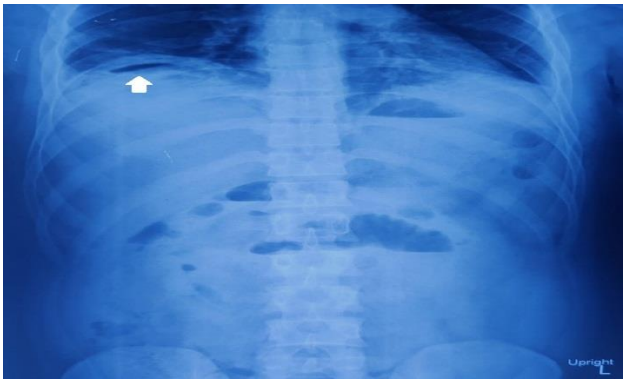

Figure 1: Erect abdominal radiograph showing subphrenic free gas.

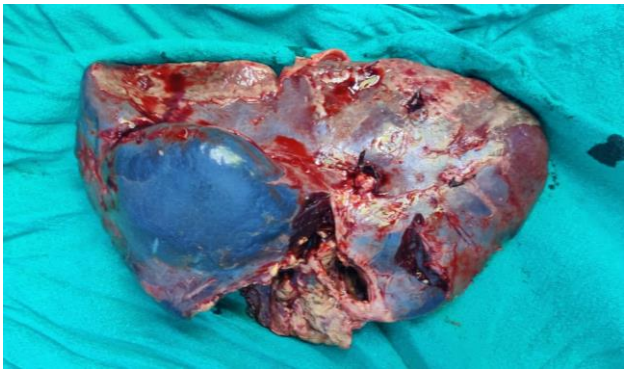

Figure 2: Post splenectomy specimen.

After adequate resuscitation with intravenous fluids, blood products, and broad-spectrum antibiotics, she was taken up for emergency exploratory laparotomy. Intraoperatively, there was a gush of air released on opening peritoneal cavity with drainage of approximately two litres of purulent fluid. Surprisingly, abdominal survey revealed no evidence of hollow viscous perforation. But the spleen was enlarged with a dark necrotic patch on its surface and peri splenic adhesions along with pus collection was noted. Further evaluation showed a rent of nearly 2×2 centimetres on the lateral surface of spleen, suggestive of a large ruptured splenic abscess (Figure 2 and 3). Since abscess cavity had engulfed whole of spleen which was not salvageable, splenectomy with drain placement was done. Post-operative period was uneventful. Pneumococcal, meningococcal, and haemophilus influenza vaccination were administered. *Escherichia coli* was identified in pus culture and appropriate antimicrobial agents were added accordingly. Patient was evaluated by haematology team with no underlying co-morbid pathogenesis of abscess identified except bacteraemia. Patient was hemodynamically stable and discharged on the fifth postoperative day. She was followed in outpatient department.

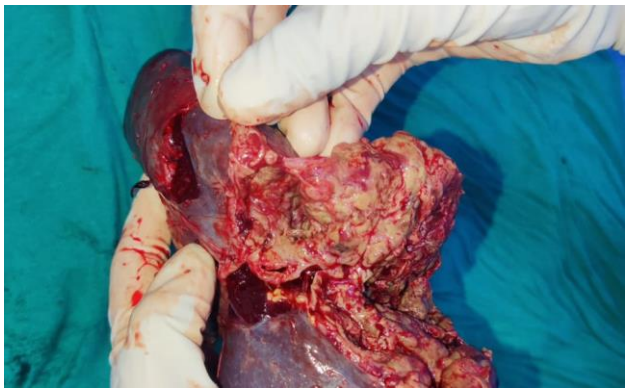

Figure 3: Specimen showing abscess cavity.

DISCUSSION

Splenic abscess is an uncommon medical condition which requires early intervention. This rare life-threatening entity carries very high mortality rate which ranges from 20% to 47%.[1] Splenic abscess has an incidence of 0.14% to 0.7%, with bimodal age distribution which peaks in third and sixth decades of life.[1,3,5] 75% of splenic abscesses are solitary while 25% are multiple.[6] Spontaneous rupture of splenic abscess is unusual. Pneumoperitoneum due to splenic rupture is even more rare condition with only less than ten cases registered until now.[7]

Bacteraemia is the primary cause of abscess formation. Major risk factors for abscess include immunocompromised state (diabetes, tuberculosis, and acquired immunodeficiency syndrome), trauma, haemoglobinopathy, neoplasms, splenic infarction and metastatic infections.[8] It may be due to hematogenous spread to a normal or abnormal spleen and also due to extension of abscess from adjacent organs like pancreas, diverticular abscess or subphrenic abscess.[11] The most commonly isolated organisms include gram negative bacteria (*E. coli*, *Klebsiella*), gram positive bacteria (streptococcus, staphylococcus), mycobacterium, fungi and parasites.[9] The non-specific presentation of splenic abscess makes it difficult to diagnose clinically.[2] The most common presentation of a splenic abscess includes the triad of fever, left upper quadrant tenderness and leucocytosis. All these three features are seen in only one third of patients. Per abdominal examination may also show splenomegaly, left upper quadrant guarding, left basilar rales and dullness at left lung base.

Suspicion of spontaneous rupture of splenic abscess should be considered in hemodynamically unstable acute abdomen cases with a background of sepsis, immunocompromised state, malignancy and

haematological disease.[10] Peritonism subsequent to rupture of splenic abscess may be the presentation in some, but the pneumoperitoneum as misleading sign in splenic abscess is a rare phenomenon. Pneumoperitoneum is pathognomonic of hollow viscus perforation, penetrating injury or post-operative states. Only less than ten cases of pneumoperitoneum due to ruptured splenic abscess are reported till now.[7] This rare phenomenon of pneumoperitoneum in ruptured splenic abscess is consequent to harbouring of gas producing organisms.

Laboratory parameters will reveal leucocytosis with a shift to left and blood cultures may be positive for causative organisms. Radiographs of chest and abdomen may reveal left pleural effusion with elevated left hemidiaphragm and very rarely, free air under the diaphragm. Ultrasound scan is mandatory in early evaluation of splenic abscess which may reveal splenomegaly with anechoic or hypoechoic areas. Contrast enhanced computed tomography (CECT) is the gold standard investigation for diagnosing splenic abscess or associated rupture that gives roadmap for treatment plan.[2] It can also assess the surrounding structures and also rule out pneumoperitoneum. Percutaneous aspiration and drainage under ultrasound or CT guidance can confirm diagnosis.

Broad-spectrum antibiotics are the mainstay treatment modality with early hospitalization in view of high morbidity and associated fatalities. High-risk patients with solitary and unilocular abscess can be drained successfully under image guided percutaneous drainage method but less recommended in multiple or multilocular abscess.[10] Percutaneous drainage is a safe, minimally invasive procedure for majority of cases as a primary treatment modality and can be undertaken prior to surgery in a hemodynamically unstable patient until definitive surgical intervention occurs.

The gold standard treatment of a splenic abscess is open or laparoscopic splenectomy. However recent studies have shown that splenectomy is indicated only in cases that failed to respond to antibiotics with or without percutaneous drainage and in case of ruptured splenic abscess with signs of peritonitis. The definitive management should be laparoscopic or open splenectomy followed by mandatory vaccination against capsulated organisms.[2,11].

CONCLUSION

Ruptured splenic abscess is a rare cause of acute abdomen which may present in surgical emergency. It should be suspected in all cases of bacteraemia with left upper quadrant pain, peritonitis and pneumoperitoneum. Unruptured cases should be treated with image guided percutaneous drainage and splenectomy is the definitive management in case of ruptured splenic abscess with non-salvageable spleen. In conclusion, a ruptured splenic abscess should be included in the differential diagnoses in patients presenting with acute abdomen and pneumoperitoneum, especially when other risk factors are present.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Raju TRSP, Paruthy SB, Mohan SK, Wani DI, Bajwa JS, Anand A, et al. Splenic abscess presenting as a case of pneumoperitoneum: a rare presentation. Int Surg J 2021;8:2503-5.