

Rare Case of Pneumoperitoneum: A Ruptured Splenic Abscess

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Abstract: Splenic abscess have a documented incidence of between 0.14% and 0.7% in autopsies. they generally occur in patients with underlying comorbidities, which commonly include neoplasia, immunodeficiency, trauma, metastatic infection, splenic infarct or diabetes [2]. The best management of splenic abscesses is still debatable with the various modalities including antibiotics, percutaneous drainage or splenectomy. To our knowledge, there have only been four other reported cases of ruptured splenic abscess causing pneumoperitoneum [4]. Here, we will discuss about a case of pneumoperitoneum in a 55 yrs old diabetic male who on exploratory laparotomy revealed ruptured splenic abscess and was managed conservatively following drainage of pus. Patient recovered uneventfully and eventually discharged on 10th day.

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I. Background

Although splenic abscesses are a clinical rarity, they have the potential to be fatal. Splenic abscess have a documented incidence of between 0.14% and 0.7% in autopsies.[1] The presentation of this disease is often vague and insidious including left upper quadrant abdominal pain, fever and chills [2]. Additionally, these patients may present with leukocytosis, left upper quadrant mass and pleural effusion on chest X-ray [1] Splenic abscesses generally occur in patients with underlying comorbidities, which commonly include neoplasia, immunodeficiency, trauma, metastatic infection, splenic infarct or diabetes [2]. The best management of splenic abscesses is still debatable with the various modalities including antibiotics, percutaneous drainage or splenectomy. The current literature supports a 67–100% success rate with percutaneous drainage [2]; however, Tung *et al.* [1] states that the most optimal treatment for splenic abscess is splenectomy.

Of the 600 cases of splenic abscess documented in the current literature, most have been described as air confined to the left upper quadrant on chest X-ray [3] To our knowledge, there have only been four other reported cases of ruptured splenic abscess causing pneumoperitoneum [4].

Incidence is believed to be increasing particularly due to the growing number of immune-compromised patients, who are more likely to present with this pathology and also to the fact that there is greater availability and use of imaging techniques such as computed tomography and ultrasound.[5] The management of splenic abscesses is based on antibiotics and assessing the possibility of percutaneous or surgical drainage, plus the possible involvement of splenectomy, depending on each case. Failure rates in percutaneous drainage are high (14.3–75%), whilst surgery remains the most effective treatment when drainage is not possible, is ineffective or the general condition of the patient will not allow it.[5-11] Although treatment results are good, mortality remains high. This is attributed to delayed diagnosis, due to non-specific symptoms and signs in over half of all cases.[12]

II. Case Report

A 55 years old male patient presented with fever for last 3-4 days and diffuse pain all over abdomen and vomiting episodes for last 2 days. He had a no similar history of such history in past. He was diagnosed as diabetic 2 years back and taking oral hypoglycaemic drugs since then. On detailed history taking, it was revealed that diabetes was not properly controlled and further examination showed that, patient was febrile, tachycardia was present (HR=110/ min), blood pressure was 90/70 mm Hg, abdomen was distended, tender on palpation and bowel sounds were absent. He was admitted and resuscitation with intravenous fluids started. In the meantime, blood investigation and xray abdomen erect AP view done. It revealed gas under diaphragm on both sides. TC 15,700 cells/ cumm,(neutrophils 87%, lymphocytes 8%), RBS 349 mg/dl, HbA1c 11.3% , ESR 20 mm, urine was positive for protein and glucose It was suspected to be a case of hollow viscera perforation and was planned for an emergency exploratory laparotomy.

After initial resuscitation and arrangement of blood and consent for surgery were completed, patient was explored and surprisingly, no visceral perforation was found. About 1 litre of pus was drained from left perisplenic and paracolic gutter, and half litre from subhepatic and rt paracolic space was drained. On thorough washing of the peritoneal cavity with 5 litres of warm normal saline, it was found that omentum was densely adhered to the splenic capsule which was ruptured. On meticulous separation of adhesions which could be done only partly, an abscess like cavity was visible of about 4cm* 3cm in size in lower part of spleen. Entire abdominal cavity was found to be otherwise normal on further exploration. The plan of splenectomy was abandoned due to poor general condition of patient and increased morbidity thereafter due to already immune-comprised state. The diagnosis of ruptured splenic abscess was thus made and conservative approach was taken. A drain was given in the left perisplenic space and another in pelvis. Abdomen was closed in layers and patient was monitored for 2 days in ICU. Bowel sounds arrived on 2nd post-operative day, following which oral sips were started. Patient was gradually put on a normal diet and meanwhile culture reports of pus came which showed klebsiella species sensitive to various drugs. Patient was already on broad spectrum antibiotics which were found to be within the sensitive range to klebsiella, hence continued for 10 days. Patient was eventually planned for discharge on day thereafter with no complications.

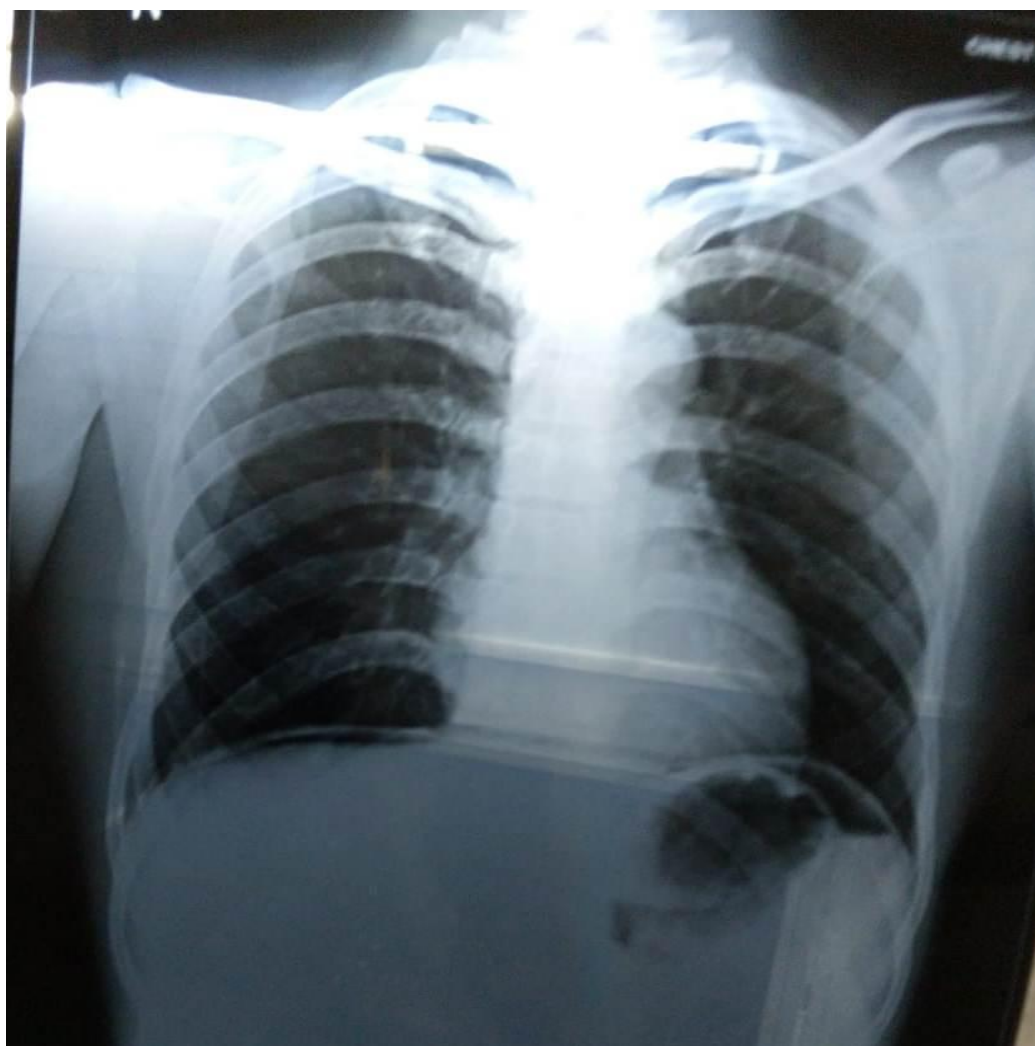


Fig : chest radiograph done at admission depicting pneumoperitoneum in this patient

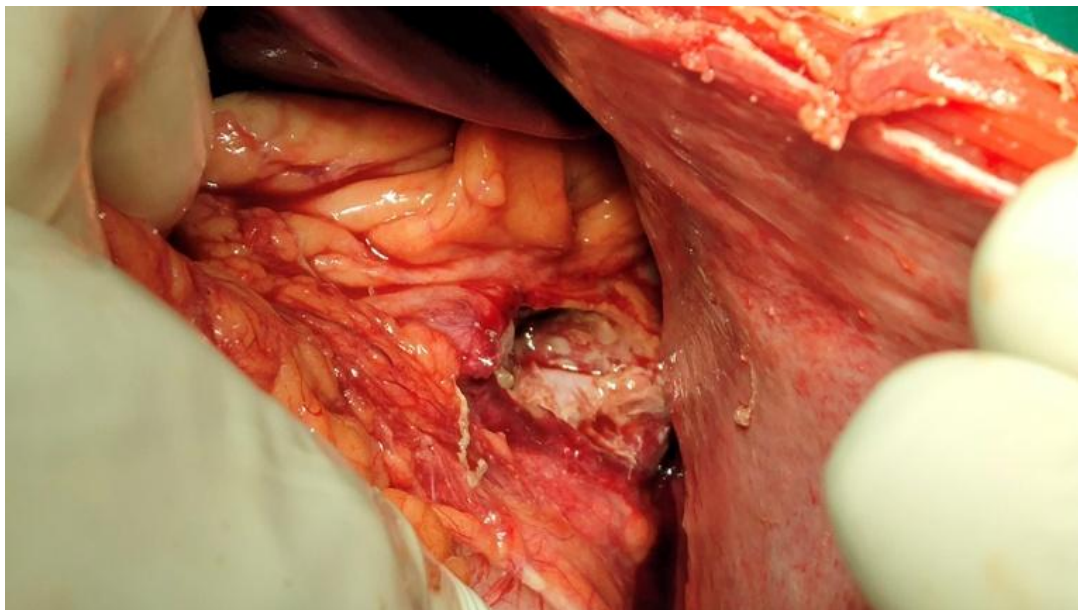


Fig. Intra –operative picture showing ruptured splenic abscess

III. Discussion

Although a rare disease, splenic abscess should be included on the differential diagnosis of a patient presenting to the hospital with peritonitis or pneumoperitoneum. Splenic abscess is an uncommon entity. The incidence of splenic abscess in various autopsy series has been estimated to be between 0.2% and 0.7%.¹⁵ The rare occurrence of splenic abscess is further evidenced by the fact that no splenic abscess was reported in a review of 540 intraabdominal abscesses.⁵ However, this uncommon disease is recently being reported more frequently. Two main contributing factors to the apparent increase in the incidence of splenic abscess are advances in imaging studies and an increased number of immunocompromised, trauma and cancer patients.^{14,16} Splenic abscesses may often be misdiagnosed, because the signs and symptoms are nonspecific; nevertheless, modern imaging has improved the process of their diagnosis. The most common organisms in most reported series¹⁷ have been aerobic microbes, and particularly *Streptococci* and *Escherichia coli*. However, there are geographical variations and population differences, as Llenas-Garcia, et al.¹⁸ reported a higher percentage of *M. Tuberculosis* in splenic abscesses. A few cases with multiple splenic abscesses caused by *Salmonella typhi* have also been described in the literature. Allal et al reported 400 patients with *S. typhi* and found splenic abscesses in 8 (2%) patients; of these only one had multiple splenic abscess.¹⁹ Torres, et al.²⁰ reported 10 cases of typhoidal solitary splenic abscesses.

In many cases spleen has been destroyed completely by the overwhelming infective process and only open drainage of abscess by laparotomy can be done. Our case was very much similar. In some cases spleen can be conserved by drainage of an abscess by surgery without removing the spleen i. e. a subtotal splenectomy.[21,22] Surgery remains the only alternative where the abscess is multifocal or multiseptate and other measures of antibiotic therapy or percutaneous drainage are unsuccessful. Surgery becomes mandatory when there is concomitant pathology like an associated bowel perforation. Complications of percutaneous drainage like bleeding or injuries to other organs have to be treated by surgery. Open surgery of splenectomy is more commonly done by midline or left subcostal incision. Thoracoabdominal incision is used when encountered with very large spleen with adhesions to the undersurface of diaphragm. In retrospect, an open laparotomy was the best approach to this patient's care as it allowed for better visualization and irrigation of the abdominal cavity. It is unknown if we had successfully performed the splenectomy laparoscopically if it would have decreased recovery time. The current literature supports the laparoscopic splenectomy as a safe and effective procedure in patients with splenic abscess demonstrating an average length of stay of 14 days [13]. In our case, the patient remained in the hospital for only 10 days after the open procedure.

Pyogenic infection remains the most common cause of splenic abscesses; however, typical organisms isolated include predominantly gram-negative bacilli such as *Escherichia coli*, *K. pneumoniae*, and *Proteus mirabilis* as well as facultative and aerobic gram-positive bacteria such as *Staphylococcus aureus* and group D *Streptococcus*. Up to 55% of infections in some series have been described as polymicrobial [23]. Endocarditis remains one of the prominent sources of infection (10%-20%) and is affiliated more closely with *Streptococcus*, *Staphylococcus*, and *Klebsiella*. Other intra-abdominal conditions have also been associated

as primary sources of these infections, including appendicitis, diverticulitis, bowel infarction, or infections of the genitourinary tract, especially with *E. coli* [23-25].

In our case, the microorganism isolated was the anaerobe *Klebsiella pneumoniae*. However, direct invasion of the spleen by means of fistulization of penetrating gastric ulcers, colonic adenocarcinoma at the splenic flexure, or distal pancreatic malignant disease has also been implicated in certain rare instances [26-27] and can produce the gas-forming necrosis of the spleen demonstrated in the case of this patient.

Concurrent liver abscesses with metastatic spread to the spleen have been detected in other series of patients studied with splenic infection. In one case series, *Klebsiella* was the major pathogen involved in this finding (100% of all patients with hepatosplenic involvement). In that cohort, it was presumed that this infection either spread from the liver to the spleen in metachronous fashion versus simultaneous co-infection [28]. Indeed, primary hepatic abscesses secondary to *K. pneumoniae* are being reported with increasing frequency, and older diabetic men such as our patient, tend to be at increased risk. In addition to this risk is increased predisposition to metastatic infection to the eye, central nervous system (CNS), and remote sites secondary to bacteremia [29].

No clear etiology of this patient's disseminated pathology became evident in the course of our investigation. Primary hepatic abscess in this setting as an initial inciting event is a possibility given the patient's predisposing risk factors, though the presence of gas-producing infection disseminating hematologically from a colonic (or other) source not investigated is also a possibility.

In summary, we have presented a case of ruptured splenic abscess as a cause of pneumoperitoneum and peritonitis. Although rare, we encourage splenic abscess be included on the differential diagnosis of patients presenting with peritonitis and pneumoperitoneum. Although there is still controversy in the current literature when managing splenic abscesses, our recommendation is splenectomy, especially in the case of ruptured splenic abscess resulting in hemodynamic instability. Furthermore, a full work-up is required for patients presenting with a splenic abscess as the underlying cause could cause more serious illnesses for the patient in the future.

References

- [1]. Tung CC, Chen FC, Lo CJ. Splenic abscess: an easily overlooked disease? *Am Surg.* 2006;72:322–32.
- [2]. Lee WS, Choi ST, Kim KK. Splenic abscess: a single institution study and review of literature. *Yonsei Med J.* 2011;52:288–92
- [3]. Manon NG, Braat JA, Hueting WE, Hazebroek EJ. Pneumoperitoneum secondary to a ruptured splenic abscess. *Intern Emerg Med.* 2009;4:349–51
- [4]. Ishigami K, Decker GT, Bolton-Smith JA, Samuel I, Wilson SR, Brown BP. Ruptured splenic abscess: a cause of pneumoperitoneum in a patient with AIDS. *Emerg Radiol.* 2003 Dec; 10(3):163-5.
- [5]. G.S. Phillips, M.D. Radosevich, P.A. Lipsitt. Splenic abscess: another look at an old disease *Arch Surg,* 132 (1997), pp. 1331-1336. C. Chang, S.K. Chuah, C.S. Changchien, T.L. Tsai, S.N. Lu, Y.C. Chiu, et al. Clinical characteristics and prognostic factors of splenic abscess: a review of 67 cases in a single medical center of Taiwan *World J Gastroenterol,* 12 (2006), pp. 460-464
- [6]. V. Smyrniotis, D. Kehagias, D. Voros, A. Fotopoulos, A. Lambrou, G. Kostopanagioutou, et al. Splenic abscess. An old disease with new interest *Dig Surg,* 17 (2000), pp. 354-357
- [7]. Y.H. Chou, C.C. Hsu, C.M. Tiu, T. Chang. Splenic abscess: sonographic diagnosis and percutaneous drainage or aspiration *Gastrointest Radiol,* 17 (1992), pp. 262-266
- [8]. A.M. Carbonell, K.W. Kercher, B.D. Matthews, C.S. Joels, R.F. Sing, B.T. Heniford. Laparoscopic splenectomy for splenic abscess *Surg Laparosc Endosc Percutan Tech,* 14 (2004), pp. 289-291
- [9]. M. Kang, A.K. Saxena, M. Gulati, S. Suri. Ultrasound-guided percutaneous catheter drainage of splenic abscess *Pediatr Radiol,* 34 (2004), pp. 271-273
- [10]. L. Thanos, T. Dailiana, G. Papaioannou, A. Nikita, H. Koutrouvelis, D.A. Kelekis. Percutaneous CT-guided drainage of splenic abscess *Am J Roentgenol,* 179 (2002), pp. 629-632
- [11]. C.C. Tung, F.C. Chen, C.J. Lo. Splenic abscess: an easily overlooked disease? *Am Surg,* 72 (2006), pp. 322-325
- [12]. H. Farres, J. Felsher, M. Banbury, F. Brody. Management of splenic abscess in a critically ill patient *Surg Laparosc Endosc Percutan Tech,* 14 (2004), pp. 49-52
- [13]. Carbonell AM, Kercher KW, Matthews BD, Joels CS, Sing RF, Heniford BT. Laparoscopic splenectomy for splenic abscess. *Surg Laparosc Endosc Percutan Tech.* 2004;14:289–91.
- [14]. Tung CC, Chen FC, Lo CJ. Splenic abscess: an easily overlooked disease? *Am Surg.* 2006;72:322–32
- [15]. Paris S, Weiss SM, Ayers WH, Jr, Clarke LE. Splenic abscess. *Am Surg.* 1994;60:358–361.
- [16]. Teich S, Oliver GC, Canter JW. The early diagnosis of splenic abscess. *Am Surg.* 1986;52:303–307.
- [17]. Ooi LL, Leong SS. Splenic abscesses from 1987 to 1995. *Am J Surg.* 1997;174:87–93.
- [18]. Llenas-García J, Fernández-Ruiz M, Caurcel L, Enguita-Valls A, Vila-Santos J, Guerra-Vales JM. Splenic abscess: a review of 22 cases in a single institution. *Eur J Intern Med.* 2009;20:537–539.
- [19]. Allal R, Kastler B, Gangi A, Bensaid AH, Bouali O, Cherrak C, et al. Splenic abscesses in typhoid fever: US and CT studies. *J Comput Assist Tomogr.* 1993;17:90–93.
- [20]. Torres JR, Gotuzzo E, Istúriz R, Elster C, Wolff M, Northland R, et al. Salmonella splenic abscess in the antibiotic era: a Latin American perspective. *Clin Infect Dis.* 1994;19:871–875.
- [21]. Nagem, Rachid G MSc, Petroinau, Andy PhD. Case note: Subtotal splenectomy for splenic abscess. *Canadian Journal of Surgery* 52. 4 (Aug 2009): E91-92.
- [22]. C. S. Changchien, T. L. Tsai, S. S. Chiou, C. H. Kuo. Sonographic pattern of splenic abscess. *AJR* 1992; 138: 259-262
- [23]. Brook I, Frazier EH. Microbiology of liver and spleen abscesses. *J Med Microbiol* 1998;47:1075–1080.
- [24]. Chang KC, Chuah SK, Changchien CS, et al. Clinical characteristics and prognostic factors of splenic abscess: A review of 67 cases in a single medical center of Taiwan. *World J Gastroenterol* 2006;12:460–464.

- [25]. Chen WH, Yen JC, Kao YF. Disseminated Klebsiella pneumoniae infection after hemorrhoidectomy. *Int J Colorectal Dis* 2007;22:993–994.
- [26]. Landen S, Closset J. Gas-producing infection of the spleen in a super-super-obese patient. *Obes Surg* 2007;17:1416–1418.
- [27]. Kawamoto K, Teramoto T, Watanabe M, et al. Splenic abscess associated with colon cancer: A case report. *Jpn J Clin Oncol* 1993;23:384–388.
- [28]. Lee WS, Choi ST, Kim KK. Splenic abscess: A single institution study and review of the literature. *Yonsei Med J* 2011;52:288–292.
- [29]. Lee SS, Chen YS, Tsai HC, et al. Predictors of septic metastatic infection and mortality among patients with Klebsiella pneumoniae liver abscess. *Clin Infect Dis* 2008;47:642–650.

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