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# Peritonitis secondary to ruptured splenic abscess: A grave complication of typhoid fever

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### ABSTRACT

Splenic abscesses are increasingly being identified, possibly due to widespread use of imaging modalities in clinical practice. The commonest clinical features are high grade fever and exclusively localised left upper quadrant abdominal pain. These symptoms are similar to most infectious diseases prevalent in the tropics, making imaging by ultrasonography or computer tomography a necessity in the diagnosis. There are reports from different geographic areas on splenic abscesses associated with typhoid fever. We reported ruptured splenic abscess presenting with peritonitis as a rare and grave complication of typhoid fever.

## 1. Introduction

Splenic abscesses are not unusual in immune-competent individuals, as believed earlier[1,2]. The clinical features of high grade fever with left upper abdominal pain should make a clinician consider splenic abscess as a possible diagnosis[2–4]. Subsequent imaging by computed tomography or ultrasonography facilitates its early diagnosis and treatment[2,3]. Most cases are difficult to manage with conservative measures. The main stay of treatment in splenic abscess is antibiotics along with surgical interventions such as percutaneous drainage or splenectomy[3–5]. We report the successful management of ruptured splenic abscess presenting with peritonitis in a young man with typhoid fever, which required splenectomy. To our knowledge, in review of literature, there is no mention of ruptured splenic

abscess presenting with peritonitis in typhoid fever.

## 2. Case report

A 29 year old man was referred to our hospital with one month fever associated with chills and rigors; and upper abdominal pain of four days. Also had cough with scanty sputum. His investigation at previous centres did not identify the cause for fever. Being from an endemic area for typhoid fever and malaria, he was empirically treated with antibiotics and anti-malarials. The routine investigations including those for typhoid, tuberculosis and malaria were negative. His symptoms persisted, and he developed left upper quadrant abdominal pain four day prior to admission. Abdominal ultrasonography showed splenic abscess, following which he was referred. He did not have any major medical or surgical illness in the past.

On examination, he was febrile, had tachycardia, no pallor or jaundice, under hydrated and his blood pressure was normal. Abdominal examination showed restricted movements with respiration and tenderness with guarding

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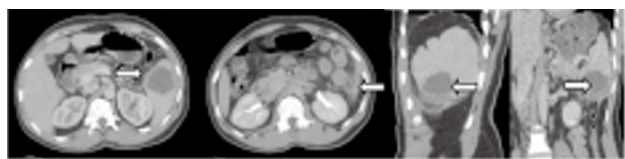
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in left upper quadrant; and normal bowel sounds. In view of earlier sonogram and presenting clinical features; a provisional diagnosis of ruptured splenic abscess with peritonitis was entertained.

Investigations done showed: haemoglobin – 12.6 g, total WBC count – 10 700 cells/mm<sup>3</sup> (peripheral smear showed reactive lymphocytosis and no haemoparasites) and ESR – 56 mm/h. The blood biochemistry: sugar, electrolytes, renal and liver function tests were within normal laboratory limits. The chest and abdominal radiographs done were normal. The serology for HIV, Dengue fever, Leptospirosis; and Mantoux test were negative. He was initially managed conservatively with antibiotics, bowel rest, fluids and supportive care, under monitoring.

The ultrasonography of abdomen showed hypoechoic lesion in the lower pole of spleen with omental adhesions, suspicious of ruptured splenic abscess. A contrast enhanced computer tomography (CECT) scan of abdomen was performed. Images in axial view (Figure 1; Panel A & B) showed a well defined hypodense peripherally enhancing lesion in the antero–inferior aspect of spleen with omental attachment. In the sagittal and coronal reformatted images focal discontinuity in the peripheral capsule of spleen with peri–splenic collection was noted (Figure 1; Panel C & D). These features were highly suggestive of a ruptured splenic abscess in the lower pole with omental attachment. He continued to have high fever and borderline hemodynamic parameters. As features of peritonitis persisted, he was subjected to an emergency laprotomy. Intra–operatively the lower pole of spleen was found to be ruptured with omental adhesions, and splenectomy was performed along with adherent omental tissue.



**Figure 1.** Panel A – Axial contrast enhanced CT scan of abdomen shows a well defined hypodense peripherally enhancing lesion in the antero–inferior aspect of spleen suggestive of abscess (marked with left pointing block arrow). Panel B – Focal linear hyperdense areas noted in the omental fat adjacent to the site of rupture suggestive of omental adhesions (marked with right sided block arrow). Panel C – Sagittal reformatted CT image shows focal discontinuity in the peripheral capsule suggestive of rupture (marked with right sided block arrow). Panel D – Coronal reformatted CT image shows focal peri–splenic collection adjacent to the lower pole (marked with left sided block arrow).

The splenectomy specimen (Figure 2) was 13 cm × 10 cm × 5 cm in dimension; with ruptured area at inferior pole measuring – 6.5 cm × 5 cm × 3.5 cm, with yellow to grey brown outer edges. The inferior pole cut surface was pale yellow and friable; rest of the specimen appeared normal. Histopathology of sections from spleen showed complete effacement of splenic architecture with sinus dilatation and mixed inflammatory cells, with areas of fibrosis.



**Figure 2.** The ruptured abscess visualised at the lower pole of the surgically removed spleen.

The blood culture done at admission by BACTEC method identified no growth. The Widal test<sup>[6,7]</sup>, showed Salmonella – ‘O’ titre 1:80 and ‘H’ titre 1:640, as against titres of 1:40 and 1:40 ten days earlier. He was continued on broad spectrum antibiotics and had an uneventful recovery. He was administered pneumococcal vaccine and malarial prophylaxis prior to discharge.

### 3. Discussion

Solitary or multiple abscesses involving the splenic parenchyma are usually seen in sepsis, systemic infection, immunodeficiency, diabetes or focal trauma, infection being the commonest<sup>[1]</sup>. A clinician must be suspicious of splenic abscess in a febrile illness with left upper quadrant pain and leukocytosis<sup>[2,4,5]</sup>. In tropical countries, symptoms of febrile illnesses and its complications often overlap, making a splenic abscess difficult to diagnose<sup>[1–3]</sup>. The usual differential diagnoses for splenic abscess in the tropical settings are tuberculosis, malaria, typhoid, leptospirosis, infectious mononucleosis, infective diarrhoea, colitis, pyelonephritis; and/or complications of these diseases. Most of these can complicate to a splenic abscess or rupture of spleen; thus the clinical diagnosis is not easy<sup>[2,3]</sup>. Our patient had similar clinical background and had received empirical treatment for typhoid and malaria for his illness. The earlier investigations being negative, the left upper quadrant pain prompted imaging which led to diagnosis and referral.

The mechanism of splenic abscess formation is either by metastatic or contiguous spread of infection, trauma or immune compromised state, secondary infection of a splenic infarct or hematoma. Various infective pathogens ranging from bacteria, protozoa, parasites to fungus can cause splenic abscesses. Among the organisms isolated mycobacterium tuberculosis, streptococcus and staphylococcal infections are the commonest<sup>[2,3]</sup>. Imaging by ultrasonography is an easy

and affordable tool; but Computer tomography is the gold standard in diagnosing splenic abscesses. The organisms can either be isolated from blood or from the abscess by culture<sup>[1,4,5]</sup>. In the present report even after being on broad spectrum antibiotic the patient continued to be toxic. The ultrasonography repeated suggested a lower pole splenic abscess with omental adhesions, probably due to rupture of spleen. The CECT images, in axial, sagittal and coronal planes demonstrated a ruptured splenic abscess at its lower pole with perisplenic collection and omental adhesion.

Rupture of intra abdominal abscesses and peritonitis as its complication is a usual surgical emergency encountered in practice. But a ruptured splenic abscess causing peritonitis is not common, and is a life threatening complication<sup>[8]</sup>. Chun et al studied 173 patients with splenic abscess and found 10% to have peritonitis due to rupture<sup>[1]</sup>. Whereas Phillips et al found 15% had peritoneal signs and 10% required emergency exploration for ruptured spleen abscess in a study done of 39 patients with splenic abscess<sup>[9]</sup>. Splenectomy by open laprotomy is the treatment of choice in ruptured splenic abscess with or without peritonitis.

Our patient continued to be toxic with clinical features of peritonitis, with conservative management. But with the evidence of splenic rupture by imaging an emergency laprotomy with splenectomy was performed. Intra operative findings were suggestive of an omental seal off at the ruptured lower pole which would explain the localised peritonitis. The parenteral broad spectrum antibiotics and supportive measures would have prevented further clinical worsening.

Acute typhoid fever, caused by *Salmonella typhi* known as enteric fever, continues to be a major public health problem world over and especially in developing countries. The transmission is by faeco–oral route, mostly affects children and young adults, and known to cause serious and fatal complications<sup>[10,11]</sup>. Even with the availability of safe water, sanitation, and public awareness the incidence is still very high. The alarming numbers of antibiotic resistance strains of *S. typhi* has made its treatment a challenge. The gold standard in the diagnosis of typhoid fever is by isolation of bacteria by culture of blood, stool or bone marrow. In an endemic area a threefold rise in Widal test titres in appropriate clinical setting is diagnostic<sup>[6,7]</sup>. Splenic abscesses associated with typhoid fever have been reported from India and from across the world<sup>[12–15]</sup>.

In the present report, the blood culture was sterile by BACTEC method. He had a fourfold rise in Widal test titres 10 days apart, which is diagnostic of enteric fever. Being from an endemic area this was diagnostic of typhoid fever<sup>[6]</sup>. There are no guidelines for the management of splenic abscesses. Ng KK *et al*<sup>[2]</sup> observed medical line alone in treatment for splenic abscess to be insufficient. A combination of medical and surgical interventions is thought to be more effective. Ferraioli G *et al*<sup>[16]</sup> recommend antibiotics along with surgical interventions for the treatment of splenic abscess. Tasar M *et al*<sup>[17]</sup> recommend CT–guided percutaneous drainage of solitary splenic abscesses to be superior to splenectomy. He further mentions percutaneous drainage for solitary splenic abscess under image guidance to be effective. Splenectomy for multiple abscesses is the safe and effective treatment choice. Lee W concluded management of splenic abscesses should be customized for each patient depending on the clinical parameters<sup>[4]</sup>. In case

with rupture of splenic abscess splenectomy is the treatment of choice along with appropriate antibiotics.

In the review of literature we did not find typhoid fever presenting with peritonitis from a ruptured splenic abscess. We feel that splenic abscess should be managed by medical and surgical interventions, depending on the clinical settings. In case of ruptured splenic abscess, splenectomy is the treatment of choice.

### Conflict of interest statement

We declare that we have no conflict of interest.

### References

- [1] Chun CH, Raff MJ, Contreras L, Varghese R, Waterman N, Daffner R, et al. Splenic abscess. *Medicine (Baltimore)* 1980; **59**: 50–65.
- [2] Ng KK, Lee TY, Wan YL, Tan CF, Lui KW, Cheung YC, et al. Splenic abscess: diagnosis and management. *Hepato-gastroenterology* 2002; **49**: 567–571.
- [3] Tung CC, Chen FC, Lo CJ. Splenic abscess: an easily overlooked disease? *Am Surg* 2006; **72**: 322–325.
- [4] Lee W, Choi ST, Kim KK. Splenic abscess: A single institution study and review of the literature. *Yonsei Med J* 2011; **52**: 288–292.
- [5] Chang KC, Chuah SK, Changchien CS, Tsai TL, Lu SN, Chiu YC, 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.
- [6] Chart H, Cheesbrough JS, Woghorn DJ. The serodiagnosis of infection with *Salmonella typhi*. *J Clin Pathol* 2000; **53**: 851–853.
- [7] Wain J, Hosoglu S. The laboratory diagnosis of enteric fever. *J Infect Dev Ctries* 2008; **2**: 421–425.
- [8] Ooi LL, Leong SS. Splenic abscesses from 1987–1995. *Am J Surg* 1997; **174**: 87–93.
- [9] Phillips GS, Radosevich MD, Lipsett PA. Splenic abscess: another look at an old disease. *Arch Surg* 1997; **132**: 1331–1336.
- [10] Kanungo S, Dutta S, Sur D. Epidemiology of typhoid and paratyphoid fever in India. *J Infect Dev Ctries* 2008; **2**: 454–460.
- [11] Bhan MK, Bahl R, Bhatnagar S. Typhoid and paratyphoid fever. *Lancet* 2005; **366**: 749–762.
- [12] Chakraborty PP, Bhattacharjee R, Bandyopadhyay D. Complicated typhoid fever. *J Assoc Physicians India* 2010; **58**: 186–187.
- [13] Jaussaud R, Brasme L, Vernet–Garnier V, Deville JF. Splenic abscess complicating *Salmonella typhi* infection. *Eur J Clin Microbiol Infect Dis* 2000; **19**: 399–400.
- [14] Chaudhry R, Mahajan RK, Diwan A, Khan S, Singhal R, Chandel DS, et al. Unusual presentation of enteric fever: three cases of splenic and liver abscesses due to *Salmonella typhi* and *Salmonella paratyphi A*. *Trop Gastroenterol* 2003; **24**: 198–199.
- [15] Allal R, Kastler B, Gangi A, Bensaid AH, Boualem O, Cherrak C, et al. Splenic abscesses in typhoid fever: U.S. and CT studies. *J Comput Assist Tomogram* 1993; **17**: 90–93.
- [16] Ferraioli G, Brunetti E, Gulizia R, Mariani G, Marone P, Filice C. Management of splenic abscess: report on 16 cases from a single center. *Int J Infect Dis* 2009; **13**: 524–530.
- [17] Tasar M, Ugurel MS, Kocaoglu M, Saglam M, Somuncu I. Computed tomography–guided percutaneous drainage of splenic abscesses. *Clin Imaging* 2004; **28**: 44–48.