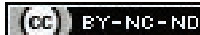


Primary Splenic Abscess: A Case Report

ILAKKIYA SEKAR¹, P MAGESHWARAN², NATARAJAN³

ABSTRACT

Splenic abscess is a relatively uncommon infection with a very low incidence but has high mortality if left untreated. It is usually associated with a predisposing factor and requires early diagnosis and urgent management either in medical or surgical modality. Drainage of the abscess is also rapidly recognised treatment option. Herein, the authors presented a case of 56-year-old male with fever, vomiting, and abdominal pain. Computed Tomography (CT) abdomen revealed a large splenic abscess with subdiaphragmatic extension and open splenectomy was performed. Histopathology confirmed the presence of necrotising granulomatous lesions in the spleen, and tuberculosis was ruled out. The diagnosis was provisionally suggested as cat scratch disease, and the patient made a complete recovery. A high level of suspicion is needed for the diagnosis of splenic abscess, owing to its non specific presentation is often non specific. CT imaging is the diagnostic investigation of choice, and investigations should target the identification of the primary foci of infection. Surgical management is still widely preferred, but more research is needed to evaluate medical management and percutaneous drainage.

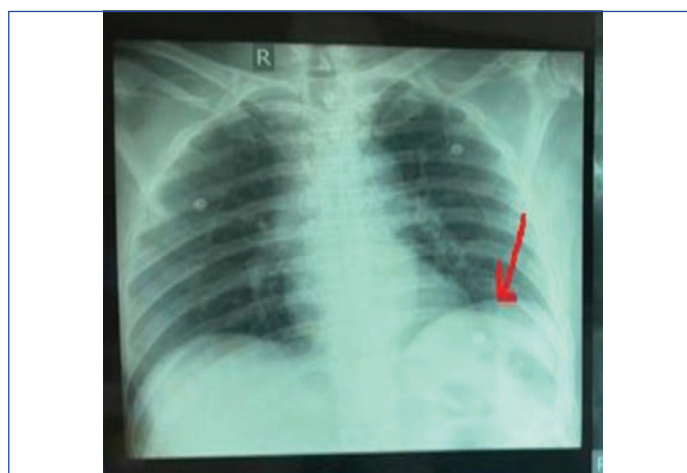
Keywords: Granuloma, Splenectomy, Splenomegaly

CASE REPORT

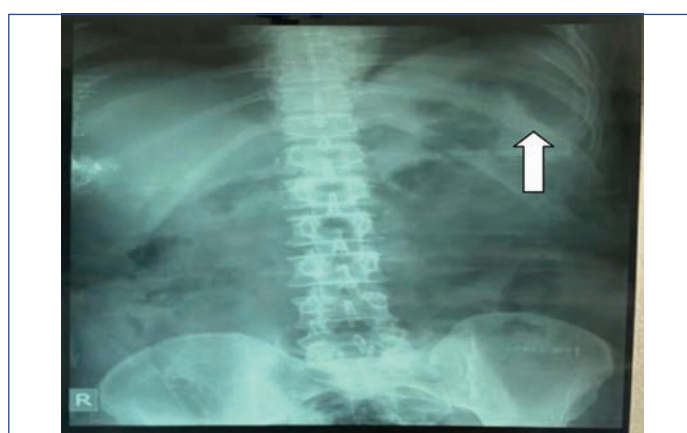
A 56-year-old male patient presented to the Emergency Room (ER) with complaints of severe abdominal pain, which was vaguely localised to the upper left side of the abdomen. The pain had been present for a week and was not aggravated or relieved by food, sleep, or any other factors. The pain was not associated with nausea or vomiting. The patient also had a fever, palpitations, and difficulty breathing for three days and presented with features of shock. On further enquiry, the patient revealed that he had experienced several frequent low-grade fever episodes in the past three months and did not report any bowel or bladder disturbances. The patient was a known chronic alcoholic, diabetic and gives history of irregular medication. There was no associated history of hypertension, bronchial asthma, ischaemic heart disease. The patient has had laparotomy 15 years back for intestinal obstruction but no recent history of accidents or known infection. The patient mentioned contact history to pets but no contact to any tuberculosis or other chronic infective persons.

Upon examination, the patient was found to be febrile (101°F), with fair hydration, tachycardia (PR-115/minute) with fall in blood pressure 100/60 mmHg. Other vitals and other systemic examination were within normal limits. A soft, non rigid abdomen was observed with a healed, non tender midline surgical scar, normal bowel sounds. Mild guarding and tenderness were felt in left hypochondrium, tenderness was observed in epigastrium and right hypochondrium as well. Patient was provisionally diagnosed to be a case of splenic abscess. Differential diagnosis of septicemia, small bowel or gastric perforation, and peritonitis were made.

The chest X-ray revealed an elevated left diaphragm, as shown in [Table/Fig-1]. X-ray erect abdomen showed air-filled lesions in the left hypochondrial region, along with the sentinel loop sign [Table/Fig-2]. CT images showed an enlarged spleen (10.8 cm) with non-homogeneous parenchymal attenuation and multifocal, ill-defined, patchy hypodense lesions of varying sizes involving the splenic parenchyma, with a subdiaphragmatic collection noted above the spleen as shown in [Table/Fig-3]. The CT findings were indicative of a subdiaphragmatic extension of a splenic abscess. Culture of blood and urine were negative for any organisms, and echocardiogram of the heart showed no vegetations.

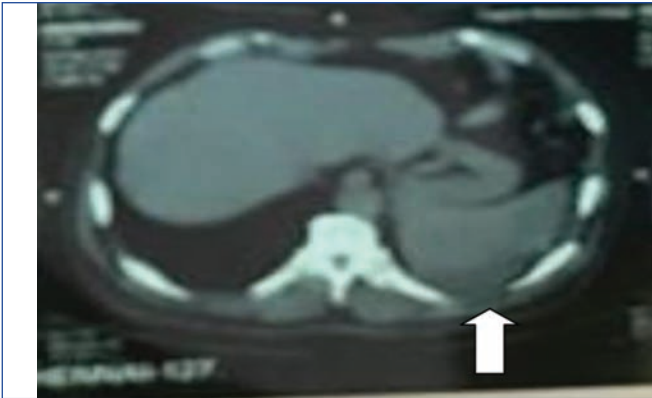


[Table/Fig-1]: X-ray shows elevated left diaphragm.



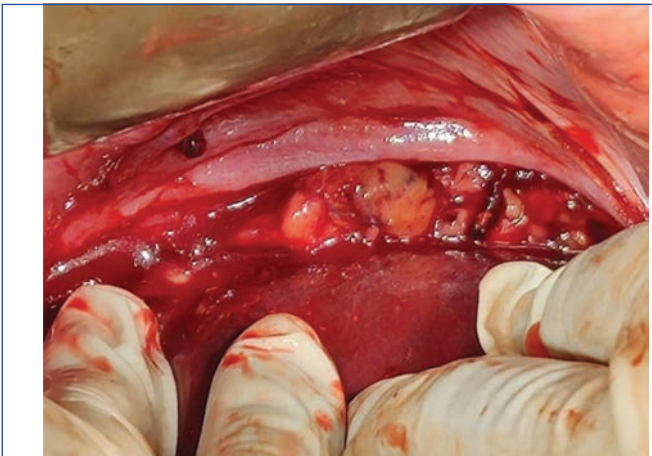
[Table/Fig-2]: X-ray erect abdomen shows gas filled shadows in left hypochondrium.

The blood investigations depicted only the acute infective phase, and blood culture did not reveal any growth. With proper preoperative antibiotic coverage (inj. piptaz 4.5 g i.v. thrice daily was started empirically) and vaccination against capsulated organisms, the patient underwent splenectomy under general anesthesia. Open laparotomy was performed with a midline incision involving the previous scar,



[Table/Fig-3]: Computed Tomography (CT) abdomen shows enlarged spleen with abscess foci with subdiaphragmatic extension.

where an enlarged spleen with perisplenic adhesions was seen. The spleen had a ruptured abscess extending into the subdiaphragmatic space. The spleen was mobilised in all directions by dividing the gastrosplenic, lienorenal, and splenocolic ligaments. The specimen was excised in total [Table/Fig-4,5]. The procedure was monotonous with uncomplicated intraoperative and postoperative periods were uneventful, and the patient was discharged with advice to follow-up with the histopathological report.



[Table/Fig-4]: Multiple abscess foci seen on the subdiaphragmatic space.

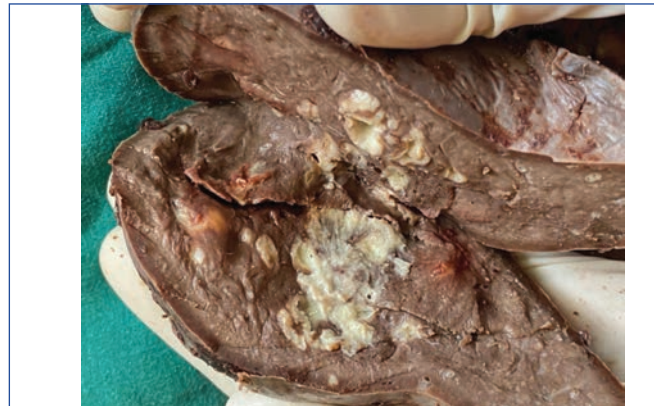


[Table/Fig-5]: Splenectomy specimen shows abscess on cross-section.

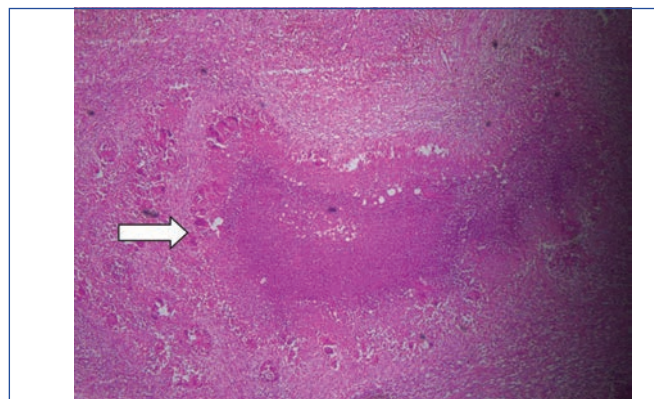
On gross examination of the excised spleen, the spleen was found to be enlarged, as evident in [Table/Fig-6]. Cross-cut sections of the spleen shows the abscess in the spleen, [Table/Fig-5]. The histopathological examination of the surgical specimen revealed necrotising granulomatous inflammation, possibly attributable to cat scratch, as seen in [Table/Fig-7-11]. The necessity to exclude the possible diagnosis of tuberculosis was felt. Hence, sputum and tissue samples were tested for Acid-fast Bacillus (AFB) to rule out tuberculosis including GenExpert, but they turned out to be negative for *Mycobacterium tuberculosis*.



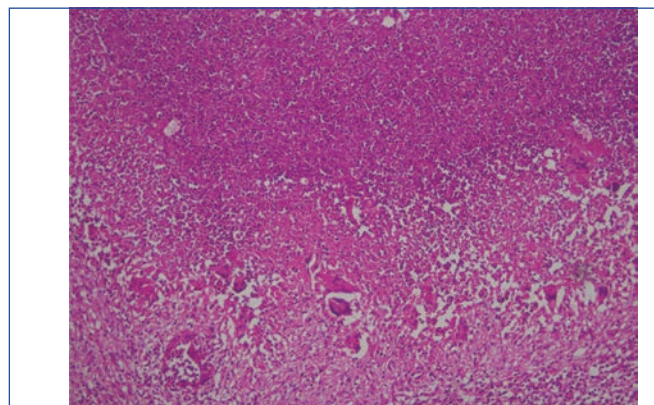
[Table/Fig-6]: Shows the enlarged spleen.



[Table/Fig-7]: Gross pathological cut section specimen of the excised spleen shows the lesion with necrotising granuloma.

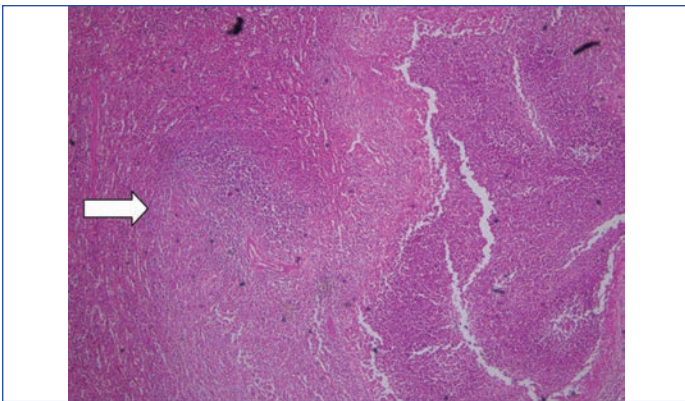


[Table/Fig-8]: Histopathological specimen (10x) showing granuloma. (Haematoxylin and Eosin (H&E), 10x).

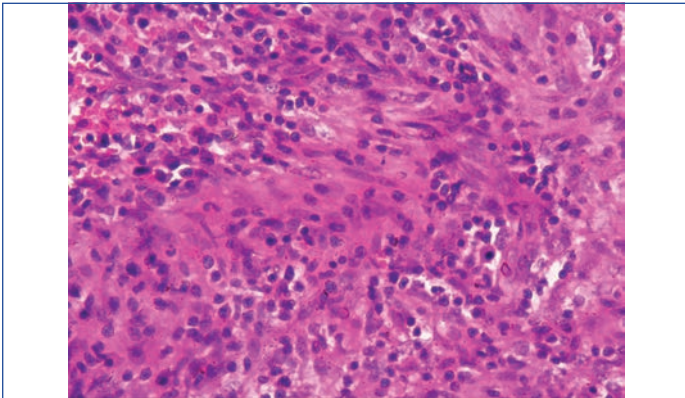


[Table/Fig-9]: Histopathological examination shows necrosis and granuloma. (H&E, 10x).

Histopathological examination revealed granulomatous lesions, as shown in [Table/Fig-8, 11], and necrosis [Table/Fig-9]. [Table/Fig-10] reveals normal spleen parenchyma with a granuloma. Considering the history of frequent exposure to pets, especially cats, and the picture of necrotising granulomatous lesions, the primary splenic



[Table/Fig-10]: Histological examination showing spleen parenchyma with granuloma (H&E, 10x).



[Table/Fig-11]: Histopathological specimen shows epithelioid cells in the granuloma (H&E, 40x).

abscess was contributed to cat scratch disease. Monthly follow-up was done for six months followed by once in three months along with clinical examination and blood investigations, which included a complete blood count, random blood glucose, renal function, liver function, and serum electrolytes, and were within normal limits. There were no signs or symptoms indicative of recurrence or splenectomy related complications.

DISCUSSION

Splenic abscess is a rare infection encountered in the clinical setup, with only approximately 600 cases described in the international literature as of now [1,2]. The incidence of this uncommon disease is found to be less than 1%, i.e., 0.14-0.7% [3,4]. If left untreated, the mortality may extend upto 100% [1,5]. In most of the instances, it is secondary to haematogenous spread of infection from any primary source of infection or associated with bacteraemia [6,7].

Studies by Saber A, Fotiadis C and Casaccia M et al., showed that a recent history of trauma, especially to the spleen, and use of Intravenous (i.v.) drugs were established as risk factors in many patients so were conditions that make the patients immunocompromised, such as diabetes mellitus, infective endocarditis, neoplasms, congenital or acquired immunodeficiency disorders, immunosuppressive medications in post-transplant patients, or autoimmune patients [1,2,8]. Trauma and infective endocarditis are seen as the most frequently associated conditions. Isolated or primary splenic abscess is even rarer than the condition per se. The advancement of modern imaging techniques and an increase in the number of patients with immune system suppression, cancer, and trauma have subsequently increased the number of patients with the said condition, as evident from the studies by Casaccia M et al., and Al-Jabali M et al., [8,9].

Patients usually manifest with abdominal pain of varying severity, non exclusively localised to the left hypochondrium like in the present case. Fever, nausea, vomiting, anorexia are the non specific symptoms that can also be presented [10]. The presentation may alter with complications like rupture or extension of abscess to adjacent

structures like diaphragm, as in the index case with subdiaphragmatic extension. The patient may present with severe toxic features in the former or with pain in the left-side of chest or left shoulder in the latter. Blood investigations may reveal features of acute infection and are generally non specific. In the studies done by Fotiadis C et al., McOwat L et al., and Lee MC and Lee CM, the common organisms diagnosed were *Streptococcus*, *Staphylococcus*, *Klebsiella*, *Salmonella*, and *Escherichia coli* [2,5,10]. While bacteria are the most commonly demonstrated causative agents, fungal and parasitic origins of infections are also widely documented, as seen in the studies by Ferraioli G et al., and Phyu H et al., [3,11]. On the contrary, abscess drainage could also be inconclusive in most instances.

Splenic abscess is a rare disease that is difficult to diagnose due to its vague presentation and infrequent occurrence. Among imaging techniques, X-ray of the abdomen is unreliable for diagnosis, while Ultrasound (USG) abdomen and Contrast Enhanced CT (CECT) or non contrast CT are diagnostic, with the latter being more effective than USG. Diagnostic imaging is needed to pinpoint the primary infection focus, such as a series of echocardiograms or MRI of the spine and other bones, as seen in a study conducted by Al-Jabali M et al., A high degree of clinical suspicion and expertise is needed for early diagnosis and prompt management. CT was diagnostic in the present case, demonstrating the abscess, but CECT could help differentiate the condition from similar conditions like splenic infarction. As uncommon as it is, the disease can be fatal if not treated immediately, with mortality ranging between 60% to 100%. Treatment modalities for splenic abscess vary from conservative broad-spectrum antibiotic management to the definitive surgical option of splenectomy. Medical management with broad-spectrum antibiotics, with attention to the culture and sensitivity testing done on the drained material, is a very effective mode of intervention. This is particularly efficacious in cases of small, uniloculated abscess diagnosed early and where the patient's condition is stable.

According to Casaccia M et al., percutaneous drainage of the abscess under imaging guidance is a valid course of intervention. This intermediate modality of treatment is gaining rapid importance in recent years. Ultrasound or CT imaging-guided aspiration can be used in patients who are unresponsive to medical management but are not fit to undergo surgical management due to co-morbidities or complicated presentation of the illness. Catheter drainage of the abscess is also a frequently practiced treatment, particularly in cases of thick abscess content. This mode of drainage effectively preserves the immunological functions of the spleen, eliminating the risk of facing post-splenectomy deadly infections.

Surgical management with the removal of the spleen is considered the treatment of choice by many. Splenectomy is a definitive treatment option but implies the risk of fulminant and life-threatening infections, as described by Ferraioli G et al., Splenectomy is especially mandated for patients with spilled infective material, large abscesses, or those unresponsive to medical management. Laparoscopic approach to splenectomy is a minimally invasive procedure with a shorter hospital stay and earlier recovery, which is preferred for moderately large abscesses with an intact spleen and minimal external extension or adhesions. The postsplenectomy management of the patient includes immunisations, antibiotic prophylaxis, and regular follow-ups.

While the gold standard treatment is still inconclusive, the present case report demonstrates the clinical course of a patient with primary splenic abscess in the Institution where splenectomy was done the patient based on his clinical condition. The authors concluded that there is still scope for research to establish the most suitable mode of treatment for the patients with splenic abscess.

CONCLUSION(S)

Splenic abscess is a rare disease with non specific presentations that require a strong clinical suspicion for prompt diagnosis. Predisposing

factors are evident in the majority of patients, with isolated primary splenic abscess being even rarer. In the index case, exposure to cat scratch disease was the primary cause of splenic abscess. CT, especially CECT, is the gold standard diagnostic test. Antibiotics, percutaneous drainage, and splenectomy are all commonly performed, with each modality of treatment having its advantages and limitations.

REFERENCES

- [1] Saber A. Multiple splenic abscesses in a rather healthy woman: A case report. *Cases J.* 2009;2:7340. Doi: 10.4076/1757-1626-2-7340. PMID: 19829945; PMCID: PMC2740156.
- [2] Fotiadis C, Lavranos G, Patapis P, Karatzas G. Abscesses of the spleen: Report of three cases. *World J Gastroenterol.* 2008;14(19):3088-91. Available from: <http://www.wjgnet.com/1007-9327/14/3088.asp> Doi: <http://dx.Doi.org/10.3748/wjg.14.3088>.
- [3] 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(4):524-30. Available from: <http://dx.Doi.org/10.1016/j.ijid.2008.08.024>.
- [4] Divyashree S, Gupta N. Splenic abscess in immunocompetent patients managed primarily without splenectomy: A series of 7 cases. *Perm J.* 2017;21:16-139. Doi: <https://doi.org/10.7812/TPP/16-139>.
- [5] McOwat L, Wong KF, Varughese GI, Nayak AU. Splenic abscess as a potential initial manifestation of quiescent infective endocarditis in a patient with bronchopneumonia. *BMJ Case Rep.* 2015; 2015:bcr2014206794. Doi: 10.1136/bcr-2014-206794.
- [6] Evan CL, Triggs MK, Desai J, Campos J. Surgical Management of a Splenic abscess: Case Report, Management, and Review of Literature. *Cureus.* 2022;14(8):e28567.
- [7] Lotfollahzadeh S, Mathew G, Zemaitis MR. Splenic abscess. NCBI Bookshelf, StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023; 2022 Dec 3 [cited 2023 Feb 15] Available from: <https://ncbi.nlm.nih.gov/books/NBK519546/?report=printable>.
- [8] Casaccia M, Macina S, Fornaro R, Frascio M, Testa T, Stabili C, et al. Splenectomy for E. coli abscess: A case report with a difficult preoperative diagnosis and unclear pathogenesis. *Int J Surg Case Rep.* 2016;25:48-50. Available from: <http://dx.doi.org/10.1016/j.ijscr.2016.04.027>.
- [9] Al-Jabali M, Ali BI, Al-Zahrani A, Al-Ajai T. Splenic abscess and management options: report of four cases. *Journal of Medical Cases.* 2016;7(10):432-34. Doi: <https://dx.Doi.org/10.14740/jmc2633w>. Available from: <https://www.journalmc.org/index.php/JMC/rt/printerFriendly/2633/1978>.
- [10] Lee MC, Lee CM. Splenic abscess: An uncommon entity with potentially life-threatening evolution. *Can J Infect Dis Med Microbiol.* 2018 ;2018:8610657. Doi: 10.1155/2018/8610657. PMID: 29666665; PMCID: PMC5830950.
- [11] Phyu H, Kobayashi T, Ford B, Molano I. Splenic abscess as a rare presentation of blastomycosis. *BMJ Case Rep.* 2020;13:e234062. Doi: 10.1136/bcr-2019-234062.

PARTICULARS OF CONTRIBUTORS:

1. Postgraduate, Department of General Surgery, Tagore Medical College and Hospital, Chennai, Tamil Nadu, India.
2. Assistant Professor, Department of General Surgery, Tagore Medical College and Hospital, Chennai, Tamil Nadu, India.
3. Professor, Department of General Surgery, Tagore Medical College and Hospital, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Ilakkiya Sekar,
202, C4, Prince Village-2, No: 8 Elaya Street, Tondiarpet,
Chennai-600081, Tamil Nadu, India.
E-mail: ilakkiya.sekar@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Jan 23, 2023
- Manual Googling: Mar 27, 2023
- iThenticate Software: Mar 29, 2023 (5%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Jan 19, 2023**

Date of Peer Review: **Feb 07, 2023**

Date of Acceptance: **Mar 30, 2023**

Date of Publishing: **Nov 01, 2023**