

## **SPLenic ABSCESSES-A STUDY OF 4 CASES**

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### **ABSTRACT**

Splenic abscess is an uncommon condition with a high mortality due to delayed detection and treatment. The growing number of immunocompromised patients has changed the frequency and pattern of disease. Splenectomy has been considered as the “gold standard” of treatment. But recently there has been a shift in trend towards spleen preserving techniques considering the important immunological function of the spleen. Patients diagnosed to have splenic abscess on the basis of ultrasound in a span of one year, from a rural secondary care hospital, were analysed. Four patients were diagnosed to have splenic abscess in this period. Each grew a different organism. Two patients were treated by percutaneous aspiration and antibiotics. One patient with multiple abscesses was treated with antibiotics alone. And one patient underwent splenectomy. Splenic abscess is on the rise due to the increasing number of immunocompromised patients. Percutaneous drainage is an effective alternative to splenectomy thus preserving the immunological functions of the spleen.

**Key words:** Splenic abscess, microbiology, management

### **INTRODUCTION**

Splenic abscess is an uncommon condition with a high mortality due to delayed detection and treatment. Fewer than 800 cases have been reported in literature. The reported incidence in autopsic series is 0.14% to 0.7%. The advent of computed tomography and ultrasonography has enabled prompt diagnosis. The disease is thought to be growing in frequency and changing in pattern because of the increasing number of immunocompromised patients. Traditionally, the “gold standard” treatment has been splenectomy. However there is increasing use of non-operating treatments worldwide<sup>1-4</sup>. The key to successful treatment is early diagnosis, effective empirical antibiotic therapy and surgical management when needed<sup>5</sup>.

Here we present a series of four cases of splenic abscess, each one interestingly growing a different organism and treated for the same either surgically or conservatively.

This article is unique for two reasons. Firstly, when we did a review of literature we found that there were not many Indian studies on this subject. Secondly, this article highlights the significant role of laboratory investigations and imaging modalities in diagnosing and managing a case of splenic abscess.

## CASE REPORT

All patients diagnosed to have splenic abscesses in the year 2006-2007 were included in the study. Patients were diagnosed to have splenic abscess based on strong clinical suspicion proved by ultrasound. The case details are as shown in Table 1. The organisms isolated and their sensitivity pattern are shown in Table 2.

All aspirate cultures were monomicrobial and each abscess grew a different microorganism. The patient with multiple splenic abscesses had pseudomonas septicemia and was HIV positive. All organisms were sensitive to amikacin and most were sensitive to quinolones and third generation cephalosporins.

On discharge all patients were afebrile. All patients were treated with antibiotics based on the sensitivity pattern. Three out of four patients were treated with the spleen preserving technique of percutaneous drainage and antibiotics. Only one patient underwent splenectomy.

## DISCUSSION

The spleen is an uncommon site of abscess formation. The intrinsic immunological function of the spleen may give relative protection against suppurative infection. It occurs more often in males and in immunocompromised patients<sup>1-3</sup>. In our case series, all patients were males and one patient was HIV positive.

Review of literature reveals a broad spectrum of clinical features, aetiological factors and causative organisms. It often presents with either vague or nonspecific signs and symptoms, making diagnosis difficult<sup>1-2</sup>. Even in our series, except for one patient who had left hypochondrial pain radiating to the left shoulder, all other patients had non-specific symptoms and signs.

Zerem et al have reported that Gram-negative bacilli are the leading cause of splenic abscess. *Klebsiella pneumoniae* was the most frequently found pathogen<sup>1,6</sup>. Only one patient in our series grew *Klebsiella*. The most common organisms in other series are aerobic microbes like *Salmonella*, *Streptococci*, *E.coli* and *Staphylococci* are as shown in Table 3<sup>2,4-5,8</sup>. In our series, of the 4 patients, one grew *Streptococcus* and the other grew *E.coli*.

Table 1. Showing Clinical details and investigations of patients with splenic abscesses.

Age	Sex	Clinical presentation	Investigations	Co-morbidities
62	M	Fever, vomiting, left upper quadrant pain radiating to the left shoulder Duration- 15days	Hb%- 9.2g PS- Microcytic hypochromic anemia Neutrophilic leucocytosis- 16,000/cmm ESR- 85mm/hr Exudative left sided pleural effusion U/S- Single large splenic abscess ms 7x5cms	Diabetic
50	M	Diffuse abdominal pain Left shoulder pain Duration- 5 days	Hb- 8.6g% PS- Microcytic hypochromic anemia Neutrophilic leucocytosis- 18,900/cmm ESR-120mm/hr U/S- Single large splenic abscess ms 4x6cms	Diabetic
60	M	Hiccups, heartburn, high grade, intermittent fever Splenomegaly Duration- 8 days	Hb- 9.6g% PS- Normocytic normochromic anemia ESR- 100mm/hr U/S- Multiple splenic abscesses	HIV infection
35	M	Fever, left hypochondrial tenderness Duration- 1month	Hb- 9g% PS- Microcytic hypochromic anemia Neutrophilic leucocytosis- 19,300/cmm ESR- 75mm/hr U/S- Single large splenic abscess ms 7x6cms	None

Table 2. Showing organism isolated and their sensitivity pattern.

Organism	Sensitivity	Treatment
Splenic aspirate- Klebsiella	Sensitive to quinolones, aminoglycosides and third generation cephalosporins	Percutaneous aspiration and antibiotics for 3 weeks
Splenic aspirate- E-Coli	Amikacin and Piperacillin+Tazobactam	Splenectomy and antibiotics
Blood culture- Pseudomonas	Sensitive to quinolones, aminoglycosides and third generation cephalosporins	Antibiotics for 3 weeks
Splenic aspirate- Alpha hemolytic streptococci	Sensitive to all antibiotics including cotrimaxazole	Percutaneous aspiration and antibiotics for 3 weeks

The routes of infection of the spleen are classically described as hematogenous - systemic infection; eg. Infective endocarditis, contiguous infection or direct inoculation e.g. penetrating injury or laparotomy. The route of infection in our patients was unclear except probably for one patient who had *Pseudomonas* septicemia. In this case the spread is likely to be hematogenous. There are several predispositions like immunosuppression, pre-existing splenomegaly and splenic trauma. Presence of Diabetes mellitus is an obvious predisposing cause. Interestingly, the association of Diabetes mellitus and splenic abscess was also noted in *Klebsiella pneumoniae* abscesses by Lee et al<sup>2,7</sup>. In our series, 2 out of 4 patients had diabetes. One had *Klebsiella* and the other had *E.coli* infection.

In the past antibiotics and splenectomy were considered the treatments of choice. The spleen is important for proper immunological function and splenectomy increases the risk of post-operative infections. Recently, splenic abscesses have been successfully managed by medical treatment and percutaneous image-guided drainage, with preservation of the spleen. Percutaneous drainage, guided by sonography or CT, decreases morbidity, reduces immune function and is less invasive than open surgery[1]. Most authors think that percutaneous drainage is the most convenient treatment when the abscess is unilocular or bilocular with a discrete wall and no internal septations and when it's liquid content is thin enough to be drained out<sup>4</sup>.

Splenectomy should be considered for multiple abscesses. The advantages of percutaneous drainage over surgical drainage are the low risk of intra-abdominal spreading, the absence of post-operative complications, including those due to anaesthesia or wound infection, a shorter hospitalization time, lower costs and better compliance of patients<sup>3</sup>. Two out of 4 patients in our series underwent percutaneous drainage and recovered completely. Only one patient underwent splenectomy and the HIV positive patient was treated with antibiotics alone since he had multiple small abscesses that were not amenable to drainage.

Table 3. Comparison of splenic abscess in various studies.

Study	Organism isolated	Management
Chee Yung Ng et al <sup>2</sup>	<i>Burkholderia pseudomallei</i> - 15 cases[71%] <i>Salmonella typhi</i> - 2 cases[10%] <i>Klebsiella pneumoniae</i> - 1 case[5%]	Splenectomy-4 cases [19%] Antibiotics- 17 cases [81%]
Jara Llenas- Garcia et al <sup>4</sup>	<i>M. tuberculosis</i> - 8[36.4%] <i>Candida</i> - 3[13.6%] Gram positive cocci- 3[13.6%] MRSA- 2[9%] Others- 6[27%]	Splenectomy- 9 cases [41%] Percutaneous drainage-1 case [4.5%] Surgical drainage- 1 case [4.5%] Antibiotics- 11 cases [50%]
Chen-Hsiang Lee et al <sup>5</sup>	<i>Klebsiella pneumoniae</i> - 8[14.8%] <i>E. coli</i> - 6 [11.1%] <i>Salmonella spp.</i> - 6 [11.1%] <i>Pseudomonas Spp</i> - 5[9.3%] Staphylococcus, streptococcus, Enterococcus- 3 each[5.6%] Anaerobes – 8[14.8%] <i>Mycobacterium tuberculosis</i> -2 [3.7%] Sterile cultures- 8[14.8%] Others- 10%	Splenectomy- 23 cases [46.9%] Percutaneous drainage- 12 cases [24.5%] Percutaneous aspiration- 2 cases [4.1%]
Won-Suk Lee et al <sup>8</sup>	<i>Streptococcus viridians</i> - 5[27.8%] <i>Klebsiella pneumoniae</i> - 4[22.2%] <i>E.coli</i> -1[5.6%] Actinomycosis- 1[5.6%] Culture negative- 7[39%]	Percutaneous drainage- 4 cases [22.2%] Splenectomy- 6 cases [33.3%] Antibiotics only- 8 cases [44.5%]
Our study	<i>Klebsiella pneumoniae</i> - 1[25%] <i>E.coli</i> - 1[25%] <i>Pseudomonas aeruginosa</i> - 1[25%] Alpha hemolytic streptococcus- 1[25%]	Percutaneous drainage and antibiotics- 2 cases [50%] Splenectomy and antibiotics- 1 case [25%] Antibiotics only- 1 case [25%]

## CONCLUSION

Although splenic abscess is rare, the incidence is increasing probably due to increase in the number of immunocompromised patients. A high index of suspicion is required for diagnosis, especially in patients with unexplained fever and abdominal pain since splenomegaly may not be present in all cases.

Percutaneous drainage is an effective alternative to splenectomy in patients with single abscesses. It is in fact the preferred modality of treatment wherever feasible considering

the importance of the immunological function of the spleen and the complications of open surgery.

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