Splenic Abscess : Clinical Features, Microbiologic Finding, Treatment and Outcome

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Abstract

Splenic abscess is a rare clinical entity but may be underreported. A retrospective study at Srinagarind Hospital revealed 60 cases of splenic abscess between 1992 and 2001. The causative organisms were identified in 41 cases (68.3%). Gram negative bacilli were commonly isolated and *Burkholderia pseudomallei* was the most predominant. Diabetes mellitus and leukemia were common underlying diseases found in 46.3 per cent and 9.7 per cent of culture confirmed cases, respectively. The patients usually presented with fever, left upper quadrant pain, tenderness and splenomegaly. Multiple abscesses were more commonly found in the melioidosis than in the non-melioidosis group ($p = 0.032$), but a single abscess was more commonly found in the non-melioidosis than in the melioidosis group ($p = 0.032$). Concurrent liver abscesses, often multiple, were not different in both groups. Antimicrobials alone were given in 66.7 per cent of cases with melioidosis and 64.7 per cent of non-melioidosis group. Splenectomy and percutaneous aspiration were performed only in 29.3 per cent and 4.9 per cent of cases with splenic abscess. The overall mortality rate of splenic abscess was only 4.9 per cent in the present series.

In conclusion, splenic abscess is not uncommon. *Burkholderia pseudomalleli* is the most common causative agent found in the present series. Therefore, it should be targeted in the initial empirical antibiotic therapy before the culture results are available especially when multiple lesions in the spleen and concurrent multiple liver abscesses are seen. Prolonged treatment with appropriate antimicrobials alone is usually effective. Splenectomy and/or aspiration may be useful in selected patients.

Key word : Splenic Abscess, Melioidosis, *Burkholderia Pseudomallei*

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J Med Assoc Thai 2003; 86: 436-441

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Splenic abscess has rarely been reported with less than 500 cases in the world literature[1-6]. The incidences and etiologies vary by region and the population of each study. In Thailand there are many infectious pathogens such as melioidosis and tuberculosis which have distinctive clinical features different from those in other countries. The number of patients with immunosuppression by diseases and treatment such as acquired immunodeficiency syndrome, systemic lupus erythematosus, steroid and chemotherapy treatment also has been increasing. Data of splenic abscess in Thailand is also lacking[7]. Therefore, experience in splenic abscess in our institute should be useful for the diagnosis and treatment.

PATIENTS AND METHOD

The hospital records of patients who had a diagnosis of splenic abscess in Srinagarind Hospital, a university hospital and tertiary care center in the northeastern part of Thailand from 1992 to 2001 were reviewed. Cases were included in the study if they meet one of the following criteria: 1) signs and symptoms consistent with an abdominal infection combined with ultrasonography or CT scan showing a hypodensity lesion(s) in the spleen consistent with abscess formation, or 2) pathologic microscopic examination of the spleen on surgery or autopsy 3) operative findings of a splenic abscess on exploratory laparotomy. Patients younger than 15 years old were excluded. The demographic data, clinical, imaging, microbiologic findings and treatment modalities were analyzed. The pathogens were identified as causative organism if it was recovered from pus directly obtained from the abscess of the spleen or from hemoculture. The bacterial splenic abscess was divided in 2 groups as melioidosis (if the etiologic pathogen was *Burkholderia pseudomallei*) and the non-melioidosis group. Groups were compared by Chi square and Fisher exact test analysis.

RESULTS

There were 60 cases of splenic abscesses during the period of study, 45 (75%) were male. The mean age of the patients was 47.31 years with a range of 20 to 70 years.

Organisms implicated

The causative organisms were identified in 41 cases (68.3%) as shown in Table 1. Gram-negative aerobic bacilli were the most common (78.1%) and *Burkholderia pseudomallei*, of which the clinical disease is known as melioidosis, was the most common isolate (58.5%).

Table 1. Microbiologic findings.

Pathogen	Number of patients
Burkholderia pseudomallei	24
Escherichia coli	4
Salmonella group D	3
Acinetobacter anitratus	1
Enterobacter spp	1
Enterococci	1
Methicillin sensitive *Staphylococcus aureus*	1
Mycobacterium tuberculosis	5
Candida albicans	1

Underlying diseases

Thirty-four of 41 culture confirmed cases (82.9%) had underlying diseases. Diabetes mellitus was the most common associated condition followed by leukemia. When these cases were divided into 2 groups; melioidosis and non-melioidosis, diabetes mellitus was more commonly found in melioidosis than in the non-melioidosis group ($p < 0.001$) (Table 2). There was no statistical difference between both groups in the number of patients with other predisposing conditions including thalassemia, renal failure and hematologic malignancy.

Four cases of tuberculous splenic abscess had no underlying disease but one had HIV infection. Splenic candidiasis was found in a leukemic patient.

Clinical features

The average duration of symptoms to the time of diagnosis was 41.83 ± 68.69 and 56.53 ± 70.37 days in the melioidosis and non-melioidosis groups, respectively with no statistical difference ($p = 0.08$).

Fever was found in all cases (Table 3). There was no statistical difference in right upper quadrant pain, left upper quadrant pain, splenomegaly, and hepatomegaly between melioidosis and non-melioidosis group.

There was multiorgan involvement in some patients. In the melioidosis group, there were also 3 cases with concurrent pyelonephritis, one each with arthritis, peritonitis and pneumonia. In the non-melio-

Table 2. Underlying diseases in splenic abscess.

Underlying diseases	Number of patients		
	Total	Melioidosis (No = 24)	Non-melioidosis (No = 17)
Diabetes mellitus	19	18	1
Leukemia	4	1	3
Thalassemia	3	2	1
Renal failure	2	2	0
Steroid abuse	2	0	2
HIV	2	0	2
SLE	1	1	0
Trauma	1	0	1
No underlying disease	7	0	7

Table 3. Clinical features in splenic abscesses.

	Number of patients		
	Total	Melioidosis (No = 24)	Non-melioidosis (No = 17)
Fever	41	24	17
Left upper quadrant pain	21	14	7
Right upper quadrant pain	5	4	1
Splenomegaly	24	12	12
Hepatomegaly	20	13	7

idosis group, one had pyelonephritis and one each had lymphadenitis, pneumonia and arthritis in tuberculous cases.

Ultrasonographic features

The ultrasonographic features of splenic abscesses are summarized in Table 4. Multiple abscesses also were more commonly found in the melioidosis group ($p = 0.032$) but a single abscess was more commonly found in the non-melioidosis group ($p = 0.032$). Concomitant liver abscesses, often multiple, were not different in both groups ($p > 0.05$).

Treatment

All patients received antimicrobial therapy. However, 66.7 per cent and 64.7 per cent in the melioidosis and non-melioidosis groups had treatment with antimicrobials alone (Table 5). Splenectomy was performed in 25.0 per cent and 35.3 per cent and radiologically guided percutaneous aspiration and drainage was done in 8.3 per cent with melioidosis but none in the non-melioidosis group.

Outcome

There were 2 deaths both due to *E. coli*. There was no death in the melioidosis group (Table 5). The overall mortality rate was 4.9 per cent, in the melioidosis and non-melioidosis group it was 11.8 per cent, and 0 per cent, respectively.

DISCUSSION

Splenic abscess is an uncommon disease entity, the incidence is estimated at 0.012 per cent per thousand hospital admission per year[2]. In previous studies[1-7] it was frequently associated with infectious endocarditis, septicemia, depressed immunological state, and intravenous drug abuse. Most cases occur after hematogenous dissemination although some may result from trauma or extension from adjacent inflammatory organs[1-7]. Most of the presented cases had diabetes mellitus as the predominant underlying condition followed by leukemia (Table 2). No case was associated with endocarditis or intravenous drug abuse, which is different from other studies. Although there is an epidemic of AIDS in Thailand only 2 cases have

Table 4. Abdominal ultrasound and/or CT scan findings of splenic abscess.

	Number of patients		
	Total	Melioidosis (No = 24)	Non-melioidosis (No = 17)
Splenic abscess	41		
Multiple	33	22	11
Solitary	8	2	6
Liver abscess	12		
Multiple	11	7	4
Solitary	1	0	1

Table 5. Treatment and outcome of splenic abscess.

	Number of patients		
	Total	Melioidosis (No = 24)	Non-melioidosis (No = 17)
Treatment			
Antimicrobials only	27	16	11
Splenectomy	12	6	6
Percutaneous aspiration	2	2	0
Outcome			
Dead	2	0	2
Survive	39	24	15

occurred in AIDS patients, one with salmonellosis and the other with tuberculosis.

Prior to 1977, splenic abscess due to streptococci and staphylococci were most common, together comprising 41.9 per cent but a recent review revealed gram negative bacilli, particularly *Salmonella* species and *E. coli* were more common[2]. In the present series, gram negative bacilli were predominant pathogens but the types were different. *Burkholderia pseudomallei* was the most common, accounting for 58.5 per cent of culture confirmed cases (Table 1). This may result from high incidence of *B. pseudomallei* infection in our region[8,9]. The bacterium causes metastatic abscess in the liver and spleen[10, 11]. *Salmonella* species and *E. coli* were also common but much less than *B. pseudomallei*. Although fungal splenic abscess may be found up to 7.1 per cent, particularly in immunosuppressed patients[2,12], the authors found only one case in a leukemic patient. Splenic infection by tuberculosis is rare and usually reported in AIDS patients[13] but the authors found tuberculous splenic abscess in 4 patients with no underlying diseases.

The signs and symptoms of splenic abscess are often nonspecific[1-6]. The patients predominantly present initially with abdominal pain and fever. Physical examination may reveal splenomegaly in 40-54 per cent, left upper quadrant tenderness in 46-59 per cent[2]. In the present series, splenomegaly and left upper quadrant pain were found in 58.5 per cent and 51.2 per cent respectively (Table 3).

In the largest review by Ooi et al[2], 64.7 per cent and 8.4 per cent of cases presented as solitary and multiple abscesses in spleen, respectively. However, the authors found multiple splenic abscesses more commonly than solitary abscess, especially in the melioidosis group (Table 4). Concurrent multiple liver abscesses were also common in the melioidosis group (29.2%). This result is similar to other studies in Thailand on visceral abscesses in melioidosis[10,11].

The most widely accepted management of splenic abscesses begins with antibiotic therapy, followed by splenectomy[1-6]. The selection of empiric antibiotic depends on the data of the frequency of the causative organisms in particular regions. According to the presented data, it is suggested that the initial

empirical antimicrobials should cover *B. pseudomallei* as the main etiologic organism.

Although splenectomy is recommended as one modality of treatment of splenic abscess and treatment of choice for patients with bacterial abscesses that are multiple or multilocular, large, perihilar, adjacent to, or involving other abdominal organs, or the presence of splenomegaly. Splenectomy was performed in only 6 cases (25%) in the present series in the melioidosis and 6 cases (35.3%) in the non-melioidosis group despite a high incidence of multiple abscesses (Table 5).

Percutaneous drainage and/or simple aspiration is an effective method and may be repeated if required[2,14,15]. It can be used as an alternative to splenectomy. In the present study, this was performed in some patients for diagnosis and removal of pus simultaneously.

The mortality of splenic abscesses without treatment approaches 100 per cent[2]. Although treatment with antibiotics alone has only been rarely reported and is generally discouraged in the literature[2,3,16], the overall mortality in the present series was very low despite the majority of cases being treated with antimicrobials alone. This difference may be explained by the difference in types of microbial pathogens. The splenic abscesses caused by *B. pseudomallei* are usually small and difficult to aspirate and drain. They usually disappear or may be left as tiny lesions without clinical significance after prolonged antimicrobial treatment for at least 5 months.

In conclusion, splenic abscess is not uncommon in the northeastern part of Thailand where *B. pseudomallei* is prevalent. This organism was the most common causative agent in the present series. Therefore, it should be covered by initial empirical antibiotic therapy before the culture results are obtained, especially with multiple lesions in the spleen and concurrent multiple liver abscesses. Prolonged treatment with appropriate antimicrobials alone was effective in many cases. Splenectomy and/or aspiration were necessary in some patients.

(Received for publication on November 18, 2002)

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ฝีในม้าม : อาการทางคลินิก, ผลจุลชีววิทยา, การรักษา และผลการรักษา

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ฝีในม้ามเป็นโรคที่มีรายงานว่าพบไม่บ่อยแต่อาจเป็นผลจากการรายงานน้อยกว่าความเป็นจริง การศึกษาย้อนหลังที่โรงพยาบาลศรีนครินทร์ในระหว่างปี พ.ศ. 2535–2544 พบมีผู้ป่วยฝีในม้าม 60 ราย พบเชื้อที่เป็นสาเหตุได้ร้อยละ 68.3 เชื้อกรัมลบรูปแท่งเป็นสาเหตุที่พบบ่อยโดยเป็น*เบอร์คโฮลเดอเรีย ซูโดมาลลีไอ* มากที่สุด โรคพื้นฐานที่พบบ่อยคือ เบาหวานและมะเร็งเม็ดเลือดขาว พบร้อยละ 46.3 และร้อยละ 9.7 ของผู้ป่วยที่มีผลการเพาะเชื้อยืนยัน ผู้ป่วยมาพบแพทย์ด้วยเรื่อง ไข้ เจ็บท้องด้านบนซ้าย และม้ามโต ฝีในม้ามจากผู้ป่วยกลุ่มโรคเมลิออยด์พบเป็นหลาย ๆ ฝีมากกว่าฝีเดี่ยว ($p = 0.032$) แต่ในผู้ป่วยกลุ่มที่ไม่ใช่โรคเมลิออยด์พบเป็นฝีเดียวมากกว่าเป็นหลาย ๆ ฝี ($p = 0.032$) การรักษาหลักคือการให้ยาปฏิชีวนะอย่างเดียวในกลุ่มโรคเมลิออยด์ร้อยละ 66.7 และกลุ่มที่ไม่ใช่โรคเมลิออยด์ร้อยละ 64.7 ส่วนการเอาม้ามออกและการดูดหนองออกกระทำในผู้ป่วยฝีในม้ามเพียงร้อยละ 29.3 และ 4.9 ตามลำดับ อัตราตายของฝีในม้ามในการศึกษานี้ต่ำพบเพียงร้อยละ 4.9 จากการศึกษานี้ฝีในม้ามพบได้บ่อยในภาคตะวันออกเฉียงเหนือของประเทศไทย *เบอร์คโฮลเดอเรีย ซูโดมาลลีไอ* เป็นเชื้อก่อโรคที่พบเป็นสาเหตุบ่อยที่สุด ดังนั้นการให้ยาปฏิชีวนะจึงควรจะให้ครอบคลุมเชื้อนี้ด้วยก่อนที่จะทราบผลจากการเพาะเชื้อ โดยเฉพาะถ้าพบลักษณะของฝีในม้ามมีหลาย ๆ ฝีหรือมีฝีในตับหลาย ๆ ฝีร่วมด้วย การให้ยาปฏิชีวนะเป็นเวลานานอย่างเดียวได้ผลดี การตัดม้ามหรือการดูดระบายหนองออกอาจจะมีประโยชน์ในผู้ป่วยบางราย

คำสำคัญ : ฝีในม้าม, โรคเมลิออยด์, *เบอร์คโฮลเดอเรีย ซูโดมาลลีไอ*

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