Splenic abscess in children: A report of three patients

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ABSTRACT

Splenic abscess is uncommon in paediatric age group. It usually occurs in conditions of disseminated infective focus. Conventional treatment of abscess is incision and drainage, although splenectomy or splenic conservation is alternative. In this report, we are presenting case summaries of three patients suffering from splenic abscess. A retrospective review of three children was managed for eplenic abscess in our institution.All three patients presented with pyrexia, weight loss, and recurrent abdominal pain for more than six weeks. Human immunodeficiency virus (HIV) antibody detection test (ELISA) was nonreactive in all of them. The first patient was managed by splenectomy because of multiple splenic abscesses involving the entire spleen; the second one had exploratory laparotomy and drainage of splenic abscess with preservation of the spleen; and the third patient had successful ultrasonic guided aspiration of abscess. The follow-up ultrasonography done after three and six months in two patients, with splenic conservation, did not reveal any recurrence of abscess. In children with splenic abscess, ultrasound guided aspiration of abscess should be the first line of treatment, when this fails either because of multiple abscesses or dense adhesions around the spleen then splenectomy or open drainage may become necessary.

Key words: Abscess, aspiration, spleen

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INTRODUCTION

Splenic abscess is a rare occurrence with an incidence of 0.14% to 0.7% in autopsy-based studies.[1] The diagnosis of splenic abscess is often not considered in children due to its rarity and nonspecific clinical features. A delayed diagnosis is associated with high mortality, emphasising the need for prompt detection and early therapy.[2] The widespread availability of improved imaging techniques has helped in the early detection of splenic abscess.[3] Splenic preserving therapy is now the standard treatment in paediatric age group to avoid the syndrome overwhelming postsplenectomy infections (OPSI).[4,5] We are reporting three cases of splenic abscess; in one case splenectomy was needed, whereas splenic conservation was possible in the rest two.

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CASE REPORTS

Case 1

A 12-year boy was admitted with mild to moderate grade continuous fever and loss of weight of three months duration. There was no history of vomiting, diarrhoea, constipation cough, respiratory distress or abdominal trauma. He had a full course of antimalarial drugs prescribed by private practitioner before two weeks. On examination, he was febrile (39.8°C), malnourished with a pulse of 100/min, blood pressure 110/80 mmHg, and weight 30 kg.

The abdomen was tender with guarding in both hypochondrial areas. The liver was enlarged by 5 cm below costal margin and was tender. The spleen was soft and 3 cm palpably enlarged below left costal margin. Bowel sounds were normal and there was no evidence of free fluid in the abdomen.

Investigations revealed a haemoglobin of 5.6 gm/dl, total white cell count (TWCC) of 16200/cmm (77% polymorphs, 21% lymphocytes); and erythrocyte sedimentation rate (ESR) was 100 mm in the first hour. C-reactive protein was 52.6 mg/L (normal <10 mg/L); blood culture was sterile. Mantoux test was not significantly reactive and HIV by ELISA was nonreactive. His liver and renal profiles were normal; radiographs of chest and abdomen were also normal. Abdominal sonography revealed a hypoechoic area in the right lobe of liver (6 cm × 6 cm) and multiple hypoechoic areas of varying sizes in spleen. CT scan of abdomen revealed a small hypodense area in the right lobe of liver with minimal peripheral enhancement on contrast and enlarged lymph nodes at the hilum of liver. Spleen was also enlarged and showed multiple hypodense areas with contrast enhancement (suggestive of liver and splenic abscesses).

The child was started on intravenous cefotaxime (150 mg/kg), amikacin (15 mg/kg), and metronidazole

(30 mg/kg) per day in divided doses. Ultrasound guided aspiration of the liver abscess and splenic abscess was attempted but was unsuccessful. The pyrexia persisted, even after five days of intravenous therapy, with worsening clinical condition.

He underwent exploratory laparotomy at which splenectomy was performed because of multiple splenic abscesses; direct aspiration of liver abscess was done using a wide bore needle which yielded around 50 ml of thick pus. In the postoperative period, patient was continued on the intravenous ceftriaxone of 100 mg/kg per day in divided doses for two weeks. Culture of pus grew mixed flora of gram positive cocci and gram negative bacilli, both of which were sensitive to ceftriaxone. Histopathological examination of spleen revealed multiple pyogenic abscesses.

He was vaccinated with pneumococcal vaccine and discharged in good condition after three weeks. He has been on a regular follow-up with benzathine penicillin 1.2 mega units intramuscularly every three weeks up to three years after splenectomy.

Case 2

A 9-year old boy was admitted with fever, cough, and a progressively increasing swelling in the left hypochondrium for two and a half months. He had a history of discharge from the right ear for the last three months. At the time of admission, the child had distended abdomen, which was progressively increasing within the last 10-12 days.

On examination, he was febrile (40°C) with a pulse rate of 92/min and blood pressure of 108/84 mmHg and he weighed 20 kg. He had otitis media in the right ear with perforation of the antero-inferior quadrant aspect of the ear drum.

The only positive finding in the abdomen was a tender splenomegaly. Investigations revealed haemoglobin of 6 gm/dl, TWCC of 7500/mm [88% polymorphs, 6% lymphocytes], and ESR of 130 mm in the first hour. Blood culture was sterile and mantoux reaction was nonsignificant. Liver function tests, urine, and stool examinations were normal. HBsAg and HIV by ELISA were nonreactive.

Abdominal sonography revealed a single large hypoechoic area with echogenic margins in spleen [Figure 1]. The child was started on cefotaxime (150 mg/ kg), amikacin (15 mg/kg), and metronidazole (30 mg/ kg) per day in divided doses. Under ultrasonic guidance, aspiration was attempted but the pus was too thick to be aspirated even with wide bore needle.



Figure 1: Ultrasonography showing hypoechoic areas with attenuated areas in spleen suggestive of abscess

He had exploratory laparotomy which revealed splenomegally with lot of adhesions around it. Intraoperative drainage of the splenic abscess revealed 300 ml of foul smelling pus, which showed gram positive cocci on microscopy and grew *Staphylococcus aureus* and *E. coli* on culture. Vancomycin in dose of 40 mg/kg/day was added based on the culture sensitivity and continued for ten days. The child was discharged in about two week's time. On follow-up after three months, ultrasonography revealed a cavity of size 3 × 2 cm in spleen, but no definite hypoechoic areas could be seen, and patient was asymptomatic; six months of follow-up, cavity size reduced significantly.

Case 3

A 10-year old boy presented with low grade fever and left upper quadrant abdominal pain of six weeks duration. Examination revealed a febrile child (39.6°C) in congestive cardiac failure. He had mitral and tricuspid regurgitation, which was confirmed by echocardiography and he weighed 22 kg. Echocardiography also revealed large vegetations (1 cm × 1 cm), on the anterior mitral leaflet, suggesting infective endocarditis. Blood culture grew streptococcus viridians; the child was started on crystalline penicillin (200,000 units/kg), and amikacin (15 mg/kg) per day in divided doses. Abdominal ultrasound revealed a large hypoechoic lesion in the spleen, suggesting splenic abscess. A needle aspiration guided by ultrasound yielded 40 ml of pus. Gram staining of the pus revealed gram positive cocci, but culture of the aspirate was sterile. Patient remained in the hospital for three weeks because of the management of the congestive failure before he was discharged. At follow up, he has

remained well and no splenic abscess could be detected on ultrasonography.

DISCUSSION

Splenic abscess is an uncommon surgical problem in the paediatric age group. The mortality rate reported by it is high (approximately 47%), and could reach 100% among patients who do not receive antibiotic treatment.[6] The predisposing factors for splenic abscess include–metastatic or contiguous infection, haematological disorders such as sickle cell anemia, immunodeficiency and trauma. In 80.6% of the patients suffering from splenic abscess, a definite predisposing factor can be indentified.[2] In our series, the third patient had infective endocarditis and the second patient had otitis media; although no predisposing factor could be found in the first patient, despite intensive investigations. The most common cause of abscess in spleen is haematogenous seeding from an infective focus located elsewhere of which endocarditis is the most common.[7] Other infective causes include typhoid fever, malaria, urinary tract infections, pneumonia, osteomyelitis, and pelvic infections.[8]

The clinical features of splenic abscess are nonspecific and include, those of a generalised infectious process such as fever (91.7%), left upper quadrant abdominal pain (63.9%), diffuse abdominal pain (19.4%), and shortness of breath (16.7%).[9] Examination revealed splenomegaly in 60% patients, left upper quadrant tenderness in 58.3%, and diffuse abdominal tenderness in 22.2%.[1] In the present report, all had splenomegally.

Leucocytosis is a common finding; in one series it was found in 88.8% of the patients;[9] our all patients had leucocytosis. Many conditions need to be ruled out before arriving at a diagnosis of splenic abscess. Foremost among these are malignancies, of which lymphomas are the most common.[10] Other conditions to be excluded are–splenic infarction, dysontogenetic cysts, splenic calcification, hydatid spleen, and splenic hemangioma (appears hyperechoic on sonography).[3]

For diagnosis, a plain X-ray abdomen is usually noninformative. Ultrasonography appears to be the initial investigation of choice for splenic abscess showing hypoechoic or anechoic lesions in the spleen. CT/MRI can help in better characterization of the lesion, but the confirmation comes only on aspiration and culture of the aspirate. The most common organisms implicated in splenic abscess are gram positive cocci, but in some studies gram negative bacilli have been implicated as the most common (55.2%).[11] However, in our studies out of three cases, two yielded gram positive cocci and one gram negative bacilli.

Management of splenic abscess includes both conservative as well as surgical measures. Splenectomy has been regarded as the treatment of choice for many years but recently many series have reported conservative procedures such as CT or USG guided percutaneous drainage procedures to be equally efficacious.[5,11] This treatment appears more rewarding because of the increased incidence of potential complications of splenectomy in children, foremost of which are postsplenectomy sepsis and some not so well understood immunological sequelae.[10] Nevertheless, many series still recommend splenectomy as the treatment of choice.[9] Conventionally, splenectomy is done by open technique as was also done in the case 1 of present study; recently, laparoscopic splenectomy has gained popularity even in the children. However, this procedure is commonly done for hematological disorders rather than splenic abscess because laparoscopic procedure usually takes longer than open technique and is technically more demanding, that is why its experience in management of splenic abscess is limited.[12]

We conclude that splenic abscess should be suspected in children presenting with pyorexia of uncertain origin with pain abdomen. Ultrasonography of the abdomen usually reveals characteristic findings of splenic abscess which should guide further modality of treatment. Lastly, splenic preservation should be the goal in children except in circumstances such as multiple abscesses and nonresponsiveness to conservative regimen.

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