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CASE REPORT

Multiple splenic abscesses caused by Salmonella typhi in a child: case report & brief literature review

Kirti M. Naranje, Devidayal, Kushaljit S. Sodhi, Meenu Singh

Abstract: *Splenic abscess is a rare entity described in pediatric age group. Only few cases are reported in literature. Enteric splenic abscess is even rarer in children. The clinical presentation of enteric splenic abscess is often insidious with non specific symptoms and signs, thus making diagnosis difficult. We report a 6 yr old girl with typhoid fever who developed multiple splenic abscesses and was successfully managed with conservative approach.*

Keywords: *spleen, abscesses, multiple, typhoid fever, S. typhi.*

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Introduction

Splenic abscess is a rare and often unrecognized complication of enteric fever. Till date, less than 40 cases are documented in literature; most are solitary with only few being multiple [1]. The clinical diagnosis requires a high index of suspicion because of its nonspecific clinical presentation. Ultrasonography of abdomen is often the first investigation needed to demonstrate the lesion while contrast enhanced computerised tomography scan (CECT) of the abdomen is required to determine the complete extent of the abscess as well as to delineate very small abscesses [2]. In children, conservative approach consisting of intravenous antibiotics and percutaneous aspiration should be used in management in order to preserve the spleen [3]. Splenectomy should be reserved for those not responding to conservative management [4]. Treatment should be prompt since it is often fatal if left untreated [1].

Case report

6 year old girl was brought to our hospital with high grade fever for about 3 weeks and diffuse abdominal pain for 2 weeks. Mother also noticed yellowish discolouration of eyes and urine for last 10 days. At presentation, she appeared pale and toxic and her axillary temperature was 104°F. General physical examination revealed a coated tongue, mild icterus and no lymphadenopathy. She had tender hepatosplenomegaly with liver palpable 7 cm below right costal margin with a span of 14 cm and spleen palpable 4 cm below left costal margin. Rest of her systemic examination was unremarkable.

Investigations revealed haemoglobin of 7.9 g/dL, total leukocyte count (TLC) of 18,530 (neutrophils 80%, lymphocyte 17%, monocytes 2%, eosinophils 1%) and platelet count of 3, 30,000/mm^3. Liver function tests demonstrated serum alanine transferase (ALT) 182 U/L, serum aspartate (AST) 162 U/L, alkaline phosphatase

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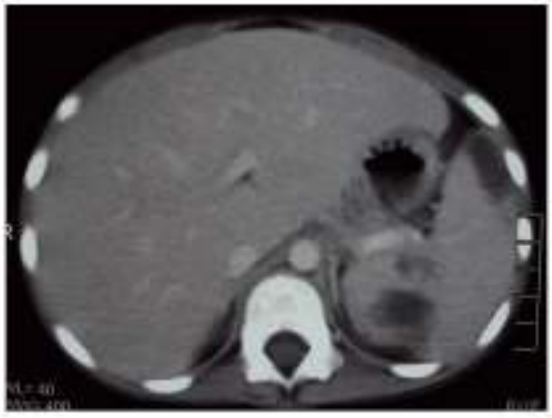
(ALP) 624 U/L, serum albumin 1.6 gm/dL and total serum bilirubin (TSB) of 7.0 mg/dL (conjugated fraction 5.7 mg/dL). Renal functions tests revealed serum urea of 13 mg/dL and creatinine 0.6 mg/dL. Routine urinalysis was normal. Multiple peripheral smear examinations for malarial parasites were negative. Her Widal test showed TH titre of 1:320 and TO titre <1:40. C-reactive protein (CRP) was 120.28 mg/L (normal range, 0.052-3.2 mg/L). Blood culture was positive for *Salmonella typhi* which was sensitive to third generation cephalosporins. Ultrasonography of abdomen performed on day 2 of hospitalisation showed hepatosplenomegaly with multiple focal hypoechoic lesions in spleen largest measuring 2.5 cm in lower pole. She was initially started on broad spectrum antibiotics comprising ceftriaxone, amikacin and cloxacillin. Metronidazole was added for anaerobic coverage and given for a total duration of 7 days. Ceftriaxone alone was continued after the blood culture report. A CECT scan of abdomen confirmed multiple focal splenic lesions with largest measuring 3 x 2 cm in lower pole (figure 1, a & b).

A diagnostic CT guided aspiration of the largest abscess yielded only 2 ml pus showing gram negative bacteria on smear examination while the culture was sterile. The small size of the abscesses and the minimal pus obtained during aspiration precluded the option of continuous therapeutic pigtail drainage. Child started showing improvement in general well being and appetite towards the end of first week of hospital stay. Fever started to defervesce on day 11 and child was completely afebrile after day 20. A repeat hemogram on day 19 showed TLC of 15,200 (neutrophils 61%, lymphocytes 32%, monocytes 32%, eosinophils 1%). Her serial biochemical parameters also showed corresponding improvement. By day 11, AST measured 130 U/l, ALT 138 U/l, ALP 538 U/l, albumin 1.8 gm/dL and TSB 3.5 mg/dL while by day 26, AST, ALT and ALP had fallen to 38 U/l, 37 U/l and 338 U/l respectively with albumin 3 gm/dL and TSB 0.8 mg/dL. Serial CRP values were 52 mg/L on day 6, 18 mg/L on day 19 and 0.6 mg/L on day 26. Serial ultrasonographic examinations demonstrated the largest abscess of 1.3 cm on day 11, 1.5 cm on day 18 and 1.0 cm on day 26. Ceftriaxone was continued for 4 weeks. In the first follow up 1 month after discharge, child was asymptomatic and hepatosplenomegaly had completely regressed. Repeat USG showed only a small hypoehoeic lesion (1 cm) in the lower pole of the spleen considered a probable infarct by the sonologist. A follow up USG at 1 year after initial illness showed no sign of the previous lesions in spleen. The child has remained well during a total follow up period of 1 and a half years.



Discussion

Splenic abscess as a complication of salmonella infection in children is a rare and distinct clinical entity.[1] The more common aetiologies reported in literature include *Staphylococci, Streptotococci* followed by *Salmonella*, *E.Coli* and *Enterococci* [5-7]. Uncommon organisms like *Mycobacterium tuberculosis, Mycobacterium avium intracellulare* and fungi like *Candida* and *Aspergillus* are being increasingly reported in immunocompromised individuals [7-9]. Anaerobic bacteria like *Peptostreptococci, Prevotella* and *Bacteroides* rarely cause splenic abscesses [10]. The common predisposing factors to splenic abscesses are pyogenic infection, splenic trauma, hemoglobinopathies like sickle cell disease, immunocompromised states, diabetes mellitus and contiguous disease process extending to spleen.

Solitary splenic abscess are more common than multiple. However in one of the latest series, multiple splenic abscesses were as common as solitary abscess [3]. Till date only few cases of multiple splenic abscesses caused by Salmonella typhi are described in literature. Allal *et al* [2] reported only one patient with multiple splenic abscess out

of 400 patients with *S. typhi*, whereas Torres *et al* [11] reported 10 cases of typhoidal solitary splenic abscesses. Nontyphoidal salmonellae have also been reported as causative agents [1]. Multiple splenic abscesses are more commonly seen in immunodeficient patients and usually have a poor prognosis.

The diagnosis may be missed especially in multiple splenic abscesses as the clinical features are often nonspecific. Fever, abdominal pain and anorexia are the presenting clinical features in most children with isolated splenic abscess. Other presentation included splenomegaly (67%) and left pleural effusion (22%).[3] The laboratory parameters again can show nonspecific findings like leukocytosis and thrombocytosis. Blood culture is reported to be positive in 48% cases, whereas abscess aspirate culture positivity varies from 14% to 73% [7, 12]. In the index case, blood culture was positive for *Salmonella typhi*. The negative culture from the aspirate could be because of antibiotic administration prior to aspiration.

The most frequently used imaging modalities for the diagnosis include USG and CT scan. Ultrasonography has been found to be useful for the initial diagnosis of splenic abscess, guiding needle aspiration and follow up of patients with abscess [3]. Computed tomography is required for complete anatomical delineation as well as for guiding aspiration and has been found to have higher sensitivity than USG [7, 13]. In contrast to pyogenic abscess seen in other organs, splenic abscess commonly do not have peripheral rim enhancement on contrast CT [3].

There are no consensus guidelines for management of splenic abscess in children. Management broadly consists of two approaches. The conservative approach comprises of antibiotics along with percutaneous needle aspiration of the abscess if required. Different authors have reported various strategies depending upon the size and number of the abscesses. Liu *et al* [14] recommended antibiotic therapy alone for splenic abscess smaller than 4 cm and aspiration drainage for those larger than 4 cm. In a series of 36 adult patients, the authors recommended percutaneous needle aspiration for smaller abscesses (< 5 cm) and percutaneous catheter drainage for those greater than 5 cm and those with bilocular abscesses [15]. The risks for any percutaneous splenic procedure include haemorrhage and injury to adjacent organs; however these can be avoided if procedures are carefully performed by an experienced person. The traditional approach of doing splenectomy is still favoured by some authors [16-17]. However, every attempt should be made to preserve the spleen due to its beneficial immunological functions in children. In one series of 18 children antibiotic therapy with or without percutaneous needle drainage was completely effective in the management of solitary as well as multiple splenic abscesses including cases of splenic abscess associated with typhoid fever [3]. In our patient also conservative approach was successful.

In conclusion, multiple splenic abscesses in typhoid fever are rare and often have non specific clinical presentation. USG and CT scan are the useful imaging modalities for accurate diagnosis. A conservative approach consisting of antibiotic therapy with or without percutaneous needle aspiration should be used initially even in cases of multiple abscesses. Surgery should be reserved for those cases who do not respond to conservative therapy.

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