Case Report

HUGE PYOGENIC LIVER ABSCESS IN A TODDLER: RESOLUTION USING ANTIBIOTICS WITHOUT DRAINAGE.

Edward Sylvester Sunday, Anyabolu Chineme Henry
Department of Paediatrics, Obafemi Awolowo University Teaching Hospitals Complex, Ile- Ife.

ABSTRACT

Pyogenic liver abscess is an uncommon disease in children; it is associated with high mortality if treatment is delayed. Percutaneous drainage and systemic antibiotics are the preferred treatment of choice, while surgery is reserved for complicated cases. It is seldom treated with antibiotics alone.

The case is A.I, a 3-year old girl that was admittedin our facility with ten days history of fever with progressive and painful right-sided abdominal swelling. She was febrile, and had huge tender hepatomegaly. Her abdominal ultrasound and Computerized Tomography-scan findings were consistent with pyogenic liver abscess; and the result of her blood culture yielded staphylococcus aureus.She had low corrected serum calcium, hypoalbuminemia and hypokalemia. She was placed on broad spectrum antibiotics and supportive treatment before parents decided to leave the hospital against medical advice. Review after completing two weeks of oral formulation of 'blood culture-guided antibiotics' showed remarkable resolution of the abscess and restoration of normal clinical state without the need for drainage.

Pyogenic liver abscess is not a common disease in children but it could be life-threatening in affected individuals. A guided use of appropriate antibiotics is very important and may aid resolution where percutaneous drainage or surgery seems impossible.

KEYWORDS: Pyogenic, Toddler, Hepatic, Abscess, Percutaneous drainage.

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INTRODUCTION

Hepatic abscess is a pus-filled collection within the liver.[1,2] It is a rare but life-threatening disease in children[3,4,5] It occurs mostly in the fifth to seventh decade of life;[3,5,6] and more common in developing countries than developed climes as a result of chronic malnutrition and increased co-morbidities like sickle cell diseases, acquired immunodeficiency diseases, and trauma.[5,7,8]There is no sexpredilection though males have poorer prognosis from hepatic abscess than females.[5]

Hepatic abscess is pyogenic in 80% of cases[7] while amoebic liver abscess is less common; the fungal form is very rare. *Staphylococcus aureus* and *Klebsiellapneumoniae*are leading causes of pyogenic liver abscess as reported in most series,[4,7,9,10]Risk factors that predispose to hepatic abscesses include parasitic infestations, abdominal infections, trauma, chronic granulomatous diseases as well as protein-calories malnutrition and immunodeficiency states.[8] The right hepatic lobe is commonly affected in about 70-80% of solitary or multiple pyogenic abscesses.[1,4,11]

Fever, right hypochondria pain and tenderness, hepatomegalyand leukocytosis are common findings in liver abscess.[4,6,8,11] Ultrasonography is a useful diagnostic modality and the best for follow up;[6,7] meanwhile computerized tomographic scan (CT-Scan) is more sensitive in detecting small abscesses.[10] Percutaneous drainage coupled with systemic antibiotics is the preferred treatment of pyogenic liver abscess (PLA) in most cases, while surgery is reserved for complicated abscesses.[5,8,11]If left untreated, pyogenic liver abscess remains uniformly fatal;

Correspondence to: Edward S. S
Senior Registrar, Gastroenterology Unit,
Department of Pediatrics,
Obafemi Awolowo University Teaching Hospitals Complex, Ile- Ife.
E-mail: eddysyl10@gmail.com

however with timely administration of antibiotics and drainage procedures, mortality is between 5-30% of cases.[5]Presence of comorbid diseases tends to worsen the prognosis in affected individuals.[5,6]

CASE

A.I is a 3year oldfemale who was admitted in our facility with ten days history of fever andpainful right-sided abdominal swelling. There was associated vomiting with reduced food intake but nohistory of jaundice and passage of clay coloured stool nor dark urine. There was no preceding history of abdominal trauma and family history was not suggestive of sickle cell disease. The patient had blood transfusion at a peripheral hospital five days before admission in our facility. She had a normal weight of 15-kilograms but was febrile and mildly pale; there was no jaundice nor digital clubbing and had no significant peripheral lymph node enlargement. She had a huge and tender hepatomegaly whichmeasured15-centimetres below the right coastal margin along the mid clavicular line; her spleen was 5-centimetres below the left costal margin. She was assessed to have hepatic abscess to rule out hepatoblastoma.

Her full blood count showedanaemiaas well as leukocytosis with neutrophilia and left shifts (Table 1). Other findings included hypoalbuminaemia, hypokalemia, and azotaemia. (Table 2). Her clotting profile was normal and serology for Human Immunodeficiency Virus and Hepatitis B & C was non-reactive. She had abdominal ultrasound that showed huge hypo-echoic lesion in segmentsVIII and V positions of the liver;and contrast abdominal CT-Scan showed huge (12.5 by 9.2cm) multi-septate hypo-dense lesion in keeping with pyogenic abscess in the right lobe of the liver (Figure 1 & Figure 2). She was commenced on empirical broad spectrum antibiotics including anti-anaerobic drugs(parenteral cefuroxime and metronidazole) as well as fluid, and potassium supplement. On the fourth day of admission, she developed spasms (tetany) involving the fingers and was placed on parenteral and oral calcium supplementation; her blood chemistryshowed marked hypocalcaemia for the corrected hypoalbuminaenia. The patient was assessed by the surgeons who could notreview her further because parents discharged against medical advice as a result of mounting hospital bills despite swinging pyrexia on the 9th day of admission. Blood culture was later retrieved and yielded staphylococcus aureus that was sensitive to ciprofloxacin but resistant to cefuroxime. She was placed onoral formulation of ciprofloxacin which patient took as outpatient for two weeks, and was given liberty to come as parents deem fit. A review after completing the antibiotics showed resolution of abdominal swelling with palpable liver of just 3-centimeter.

Further review after a year showed a well growing childweighing 20-kilogram and had normal ultrasound finding with no demonstrable hepatic lesion. Her serum albumin and electrolytes levels were normal (Table 3) and thehaemoglobin electrophoresis was HbAS.

Table 1: Full blood count results

Request	**Results (Normal)[12]**
PCV	24% (34-40)
WBC	36,700/cmm (5-14.5)
Neutrophil	83% (37-71) with left shift
Lymphocyte	17% (17-67)
Platelet	379,000/cmm (150000-400000)

Table 2: Liver function test

Request	Results
Total bilirubin	6umol/l (3.4-17)
Conjugated bilirubin	3umol/l (<6)
Albumin	26-g/l (37-55)
Aspartate transaminase	12U/l (20-60)
Alanine transaminase	9U/l (6-45)
Alkaline phosphatase	233U/l (145-320)
Potassium	2.3mmol/l (3.5-5.5)
Sodium	126mmol/l (136-145)
Urea	11.5mmo/l (1.8-8.9)
Creatinine	144umol/l (10.6-93.7)
Calcium	1.67mmol/l ((2.18-2.45)

Table 3: Electrolytes with Albumin

Albumin	40g/l (37-55)
Potassium	4.2mmo/l (3.5-5.5)
Urea	2.2mmo/l(1.8-8.9)
Creatinine	50umol/l (10.6-93.7)
Calcium	2.23mmol/l (2.18-2.45)

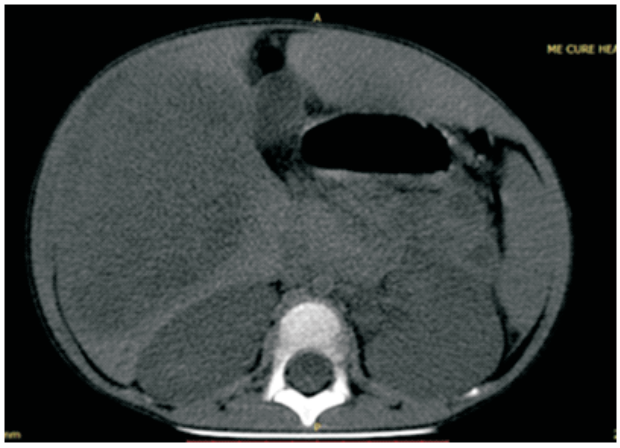

Figure1: Contrast Abdominal CT-Scan (at 0-minute) showing huge hypo-dense lesion in the right hepatic lobe

Figure 2: Contrast Abdominal CT-Scan (at 10-minutes) showing huge multi-septate hypo-dense lesion in the right hepatic lobe

DISCUSSION:

Liver abscess is a suppurative hepatic lesion that was first described by Hippocrates about 400 BC, but the seminal review of the pyogenic form was published by Ochsner et al in 1938.[13]PLA is a rare condition with variable geographic annual incidence of 3.6 cases per 100,000 individuals in the United States up to 17.6 per 100,000 in Taiwan.[14-15]The disease is more common after the fifth decade than in younger population[5,16-18]

PLA is solitary in 65%-85% of cases but often multi-septate. Its predilection for the right hepatic lobe in 70-80% of the cases[1,4,11,20-21] can be attributed to the high volume of the right portal vein whose course is almost in the direction of the common portal vein, while the left portal vein takes a more horizontal direction. The source of PLA could be biliary, portal, arterial, traumatic, or cryptogenic;[10] the heavy blood supply to the liver coupled with its contiguous closeness to several intra-abdominal organs makes it vulnerable to insult following blood infection and inflammatory diseases affecting abdominal organs.

Organisms can be isolated from the majority (70%-80%) of abscess aspirates;[20,22]Staphylococcus aureus, Klebsiella pneumonia and Escherichia coli are some of the leading isolates in some series.[4,7,9,10,16]In the absence of abscess aspirate specimen, blood culture may be useful in providing a clue to the aetiologic agent as seen in this report. Fever, abdominal pain with tenderness and hepatomegaly are common features in 88-94%, 89-93%, 80% respectively;[1,8] this expected feature of inflammation is similar to the findings in our report.

The bacterial cause of PLA explains why leukocytosis with neutrophilia is commonly associated with the disease as seen in findings from several reports including the index case report.[4]The findings of hypocalcaemia in this report could be due to associated sepsis as well as citrate-induced calcium chelation from blood transfusion before the patient presented to our facility. The defective synthetic, secretory and

excretory functions of the liver during this acute condition explain why hypoalbuminaemia, elevated alkaline phosphatase, liver aminotransferases and total bilirubin levels are sometimesreported.[21,23]

Ultrasonography has a sensitivity of 96% in diagnosing liver abscess and also useful for follow up; meanwhile CT scan is able to detect small abscesses with sensitivity of 100%.[6,10]Percutaneous drainage in the form of catheter drainage or needle aspiration in addition to guided antimicrobial therapy is the mainstay of therapy.[1,4,8,24] Surgery should be considered in patients with large or multiple abscesses as well as cases of failed percutaneous drainage.[3] With timely administration of antibiotics and drainage procedures, mortality currently occurs in 5-30% of cases.[25]Multiple abscesses, complications such as sepsis, multi-organ failure and severe hepatic dysfunction tend to increase mortality.[6,8,22] The fact that the parents of the patient left against medical advice is further lending credence to the high poverty level in developing countries where health is predominantly financed by out of pocket expenses.

CONCLUSION

Pyogenic liver abscess is a rare disease with high fatality in children. Radiological and etiological evaluations are important in the management. Although percutaneous drainage combined with antibiotics is currently the mainstay of therapy in majority of cases; however, where drainage and surgical intervention are not feasible, guided antimicrobial therapy alone may still be effective.

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