



## A RARE PRESENTATION OF SALMONELLA TYPHI AS MULTIPLE LIVER ABSCESS WITH TYPHOID FEVER IN A CHILD

### Microbiology

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### ABSTRACT

Etiologic agents and risk factors of liver abscess have shown changing trends in recent years. Salmonella Typhi causes enteric fever which is a major cause of morbidity and mortality in children and adolescent in developing countries. However, it is not considered as an important causative agent of pyogenic liver abscess. Although liver is often involved in children in typhoid but complication and presentation as liver abscess is rare. Thus, a rapid identification is crucial for the institution of timely management and effective outcome of the disease. Hereby, we present a case of a 6 year old male child with multiple liver abscess which had a favourable outcome consequent to timely diagnosis and management.

### KEYWORDS

Pyogenic liver abscess, Typhoid fever, Salmonella Typhi, Complication

### INTRODUCTION:

Liver abscess (LA) is an encapsulated collection of suppurative material within the liver parenchyma, which may be infected by bacterial, fungal, and/or parasitic micro-organisms<sup>1</sup>. In developing countries like India, majority of LA particularly in younger population is due to parasitic aetiology i.e. amoebic liver abscess. Bacterial liver abscess also called as pyogenic liver abscesses (PLA) are uncommon entity, and is most likely due to biliary disease which accounts for 30-50% of reported cases<sup>2</sup>. *Escherichia coli* is most isolated organism in western countries<sup>3</sup> while *Klebsiella pneumoniae* isolated more commonly in Asian (50-73%)<sup>4</sup>. *Bacteroids*, *streptococcal spp.* and *microaerophilic streptococci* are other etiologic agents of PLA. Salmonella Typhi continues to be a major public health problem in developing countries that causes enteric fever mainly, but presentation of Salmonella Typhi as LA is highly unusual which poses diagnostic challenge. Here, we present a case report of PLA caused by Salmonella Typhi in an immune-competent child having undiagnosed typhoid fever.

### CASE REPORT:

A 6 years old, male child admitted to paediatric emergency with complaints of fever for 8 days, pain in abdomen for 3 days and not passing stool for 3 days. Fever was insidious in onset, non-progressing, on and off type, not associated with chills and rigor. Pain in abdomen was insidious, progressive, more in right side, and non-radiating to back or leg. There was no history of altered bladder habit, diabetes, bleeding through any orifices or any immunodeficiency. Child belong to the low socio-economic status and having no vaccination history.

On examination, child was conscious, alert, irritable, mildly dehydrated and icterus was present. Vitals were stable. There was no history of pallor and lymphadenopathy. Signs of distention was present per abdomen with tenderness, guarding and liver was palpable 3.5 cm below coastal margin. Rest of the systemic examination were normal.

On ultrasonography (USG), multiple abscess in right lobe of liver with largest being 105 CC with liquefied content were found. Chest X-ray showed elevation of right hemi-diaphragm and blunting of right cardio-phrenic angle. A guided needle aspiration via pigtail catheter under empirical antibiotic cover was done and contents sent for the amoebic trophozoite examination and culture. The child also underwent exploratory laparotomy with peritoneal lavage after a day for secondary rupture and peritonitis. Peritoneal lavage fluid was sent for the culture.

Direct microscopy of aspirated contents from pigtail catheter did not show any trophozoite or cyst of *Entamoeba histolytica* in wet mounts. Aerobic culture of aspirated contents from pigtail catheter yielded *Salmonella enterica*. On serotyping; isolate was agglutinated by poly

O, O-9, H-d; resulting to serotype Typhi. *Salmonella enterica* Typhi was sensitive to ceftriaxone, ciprofloxacin, amikacin, gentamicin, piperacillin + tazobactam, imipenem and meropenem by Kirby-bauer disc diffusion method. The peritoneal lavage fluid culture was sterile. Based on these findings patient was advised for widal test which revealed titers as Typhi somatic O antigen ( $T_o$ ) = 50, Typhi flagellar H antigen ( $T_H$ ) > 200, flagellar antigen of *Paratyphi* ( $A_{H_i}$ ) < 50. The blood culture at 2<sup>nd</sup> week was negative. Although, Serum IgG antibody against *Entamoeba histolytica* was raised but no 4 fold rise were demonstrated. Stool and urine culture were negative.

Liver function test reveals total bilirubin: 0.9 mg/dl, ALT: 39 U/L, ALP: 105 U/L, AST: 42 U/L. Blood urea and serum creatinine were 40 mg% and 0.5 mg% respectively.

Child was treated with appropriate antibiotics based on culture and sensitivity report and became afebrile and discharged after 10 days. After completion of treatment 3 more stool and urine sample investigated to exclude the possibility of carrier state. Thereafter, child remains asymptomatic during follow up.

### DISCUSSION:

PLA is a rare complication of typhoid fever and associated with predisposing factors like, intravenous drug use, spread of a contiguous infectious process, hemoglobinopathies, pre-existing hepatobiliary diseases, malignant tumours and in immunosuppressed condition<sup>5,6</sup>. But in case of our patient, there was no such history. The primary pathophysiological mechanism involved in typhoidal Salmonella infection is invasion of the mucosa of distal ileum followed by bacteraemia and seeding in different organs<sup>7</sup>. Hepatic involvement in typhoid fever is common in children but liver abscess due to *Salmonella spp.* is rare<sup>8</sup>.

Bacteraemia is only detectable in 43% of cases<sup>9</sup>, which further enhances diagnostic difficulty, as in our case blood culture showed no growth. Culture of percutaneous ultrasound guided pus aspirate helps in establishing microbiological aetiology and planning further diagnostic and therapeutic actions. Failure of bacterial isolation on peritoneal lavage fluid culture, could be attributed to the patient's empirical antibiotic therapy. Widal test was positive for recent infection of Salmonella Typhi ( $T_o$  = 50,  $T_H$  = >200) which leads to the diagnosis of underlying typhoid fever. Lack of 4 fold rise of IgG antibody of *Entamoeba histolytica* exclude any current amoebic pathology and sero-conversion might be due to anamnestic response. Negative stool and urine culture indicates successful clearance of organism after antibiotic therapy.

Thus, possibility of typhoid fever should also be ruled out in case of multiple liver abscess even in an immune-competent child without any

hepatobiliary pathology particularly in endemic countries like India.

#### CONCLUSION:

Liver abscesses due to Salmonella Typhi are a relatively rare occurrence. Inadequate treatment, delayed presentation, drug resistance and other associated factors could lead to this type of serious complication. Ultrasound play key roles in diagnosis of PLA, but confirmation of etiological agent requires a complete diagnostic workup including blood/pus cultures, widal test and others serological tests, based upon which proper treatment could be initiated. Clinician should consider typhoid fever as a differential diagnosis in case of multiple liver abscess. Improved sanitation, awareness and vaccination can decrease such complications and mortality rates.

#### DECLARATIONS

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