CASE REPORT

JIACM 2026; 27 (3): 231-33

Salmonella typhi Liver Abscess in an Immunocompetent Adult

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Abstract

Salmonella enterica serovar typhi commonly causes enteric fever, with hepatic involvement typically manifesting as mild hepatitis. Pyogenic liver abscess due to S. typhi is rare, particularly in immunocompetent individuals. We report a 48-year-old immunocompetent man who presented with a 4-week history of right upper quadrant abdominal pain, intermittent fever, and weight loss. Laboratory investigations were largely unremarkable except for elevated C-reactive protein. Contrast-enhanced computed tomography revealed a large subcapsular hepatic abscess in segments VI–VII. The patient underwent ultrasound-guided aspiration, yielding purulent material. Blood cultures were sterile; however, culture of the aspirated pus grew Salmonella typhi. He was treated with percutaneous drainage and intravenous ceftriaxone followed by oral antibiotics, resulting in complete clinical and radiological improvement. Salmonella typhi is a rare cause of pyogenic liver abscess and may present without classical features of enteric fever or positive blood cultures. This case highlights the importance of routine microbiological evaluation of abscess fluid for accurate diagnosis and targeted therapy, even in immunocompetent patients.

Key words: Salmonella Typhi, liver abscess, hepatic abscess, typhoid fever.

Introduction

Enteric fever caused by *Salmonella enterica* serovar Typhi remains an important infectious disease in endemic regions. Hepatic involvement is frequently encountered and may manifest as hepatomegaly, mild hepatitis, or cholestatic liver dysfunction[1]. However, pyogenic liver abscess due to *Salmonella typhi* is rare and represents an unusual focal suppurative manifestation of infection[2-11].

Pyogenic liver abscesses (PLA) are typically caused by organisms such as *Klebsiella pneumoniae*, *Escherichia coli*, and Streptococcal species, while amoebic liver abscess remains an important differential diagnosis in tropical countries[12]. *Salmonella typhi* is an uncommon aetiological pathogen, and microbiologically confirmed cases from abscess aspirates are infrequently documented, particularly in immunocompetent hosts.

We report a culture-confirmed case of *Salmonella typhi* liver abscess diagnosed by aspirate culture of a solitary hepatic abscess in an immunocompetent patient, highlighting an uncommon presentation of enteric infection and the diagnostic value of microbiologic evaluation of drained abscess material.

Case Summary

A 48-year-old man, with no pre-existing comorbidity presented with a history of dull aching right upper abdominal pain for 4 weeks. He also reported intermittent fever with chills and rigors. There was a history of intermittent over-the-counter antibiotic use without symptomatic relief. His appetite had declined during this period, and he reported a weight loss of 3 kg. There was no jaundice or dark urine, no burning micturition and no cough or expectoration.

His complete blood count and liver function tests were unremarkable. However, C-reactive protein was mildly elevated, i.e., 24 mg/L. Ultrasonography (USG) of abdomen revealed an ill-defined peri-hepatic collection. Contrast enhanced computed tomography (CECT) abdomen was done for further characterisation.

CECT demonstrated a sub-capsular septated abscess involving hepatic segments VI and VII measuring 9.7cm x 7.6 cm x 3.1 cm (Fig. 1). He was started on piperacillin-tazobactam and metronidazole. Under USG guidance 50 mL of purulent material was aspirated. Culture of the aspirate using the BACTEC automated system identified *Salmonella typhi* (Fig. 2). The isolate was sensitive to most first-line antibiotics (Table I). Accordingly, antimicrobial therapy was changed to intravenous ceftriaxone.

The patient became afebrile within three days of aspiration and initiation of targeted antibiotic therapy. IV antibiotics were continued for 10 days. Repeat ultrasonography demonstrated only 30 mL of residual abscess cavity. He was discharged with advice to continue oral cefixime for four weeks.

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Fig. 1: *CECT abdomen showing multiseptated abscess.*

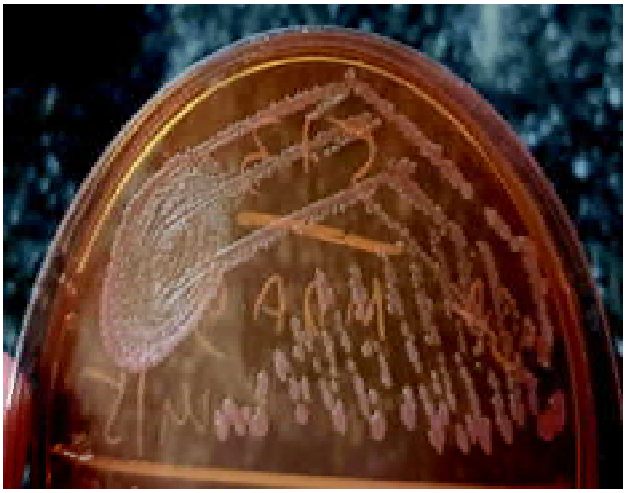


Fig. 2: *Smooth grey-white translucent non-haemolytic colonies in blood agar.*

Discussion

Salmonella typhi classically presents with fever, accompanied by chills, headache, arthralgia and myalgia in the first week. Abdominal pain and transient macular erythematous rashes appear in the second week of illness. Delayed initiation of antimicrobial therapy can result in ileal perforation during the third week, complicated by secondary bacteraemia and peritonitis[1,13].

S*almonella* species can disseminate haematogenously and establish extra-intestinal foci of infection involving the hepatobiliary system, spleen, bone, meninges, urinary tract, and vascular endothelium[13]. Predisposing conditions reported in the literature include diabetes mellitus, immunosuppression, malignancy and chronic carrier states[1,7]. Nevertheless, isolated cases in immunocompetent hosts have also been reported, suggesting that clinically significant focal hepatic infection may occur even in the absence of overt immunodeficiency (Table II).

Table I: Biochemical and microbiological parameters.

Parameters	Normal range	Reports
Hb (in g/dL)	13 - 16	12.2
TLC (x10^9/L)	4 - 11	7.69
Plt (x10^3/uL)	1.5 - 4	263
CRP (in mg/L)	<5	26
Bilirubin (D) (mg/dL)	0.3 - 1.3	0.22 (0.14)
AST (IU/L)	20 - 50	13
ALT (IU/L)	20 - 50	10
ALP (IU/L)	90 - 120	320
Total Protein (g/dL)	6 - 8	7.79
Serum Albumin (g/dL)	3.5 - 5.5	4.15
Serum creatinine (mg/dL)	<1	0.72
Blood culture	–	Sterile
Pus culture from liver abscess	–	*Salmonella typhi* sensitive to Ciprofloxacin, Ceftriaxone, Cefotaxime, Azithromycin, Cotrimoxazole

Table II: Summary of few reported cases of Salmonella liver abscess.

Author	Country	Gender and age	Predisposing condition	Diagnosis
Soni *et al*[2]	South Africa	Male/47 y	None	Positive culture from abscess aspirate and widal
Ciraj *et al*[4]	India	Male/64 y	Cholelithiasis	Positive culture from abscess aspirate
Morajelo *et al*[11]	Spain	Male/84 y	None	Positive culture from abscess aspirate
Kabra *et al*[12]	India	Male/8 y	None	Positive culture from abscess aspirate and widal
Gomceli *et al*[6]	Turkey	Male/30 y	Solitary simple liver cyst	Positive culture of the abscess aspirate
Jorge *et al*[9]	Brazil	Male/24 y	Metastatic melanoma liver	Positive culture of the abscess aspirate plus positive blood culture
Gailson *et al*[13]	India	Female/5 y	None	Positive culture from abscess aspirate and widal
Rajan *et al*[14]	India	Male/60 y	Diabetes Mellitus	Positive culture from abscess aspirate
Neki *et al*[15]	India	Male/65 y	Diabetes Mellitus	Positive culture from abscess aspirate
Mnif *et al*[10]	Tunisia	Male/77 y	Cholelithiasis	Positive culture of surgical drain fluid
Present case	India	Male/48 y	None	Positve culture from abscess

Our patient, an immunocompetent man presenting with prolonged fever and right upper quadrant pain without diarrhoea, illustrates several diagnostically important aspects of this uncommon entity. First, the clinical presentation lacked classical enteric fever manifestations.

Similar atypical presentations have been observed in prior reports, where patients often presented predominantly with fever, abdominal pain, weight loss or constitutional symptoms rather than overt gastrointestinal disease. In a recent report from Tunisia, an immunocompetent elderly male with *S. typhi* liver abscess presented mainly with abdominal symptoms and constitutional features, with diagnosis established from abscess culture despite negative blood cultures[11]. Our patient mirrors this diagnostic pattern, reinforcing that typhoidal liver abscess may masquerade as conventional pyogenic abscess. Moreover, our case highlights the diagnostic value of abscess aspirate microbiology. Blood cultures in typhoid fever may become negative because of delayed presentation, low bacteraemic burden, or antecedent antibiotic exposure[1,8,13]. In the present case, blood culture was negative whereas aspirated pus yielded *Salmonella typhi*, directly establishing microbiologic causality. Similar discordance between blood and abscess cultures has been documented in published reports, emphasizing the importance of microbiological examination of drained material (Table II).

The pathogenesis of *S. typhi* liver abscess remains incompletely understood. Proposed mechanisms include haematogenous seeding during transient bacteraemia, ascending biliary infection, direct extension from adjacent hepatobiliary infection, or secondary infection of pre-existing hepatic lesions (Table II). Several published reports support the role of anatomical hepatobiliary abnormalities as predisposing substrates. Gömceli *et al* described *S. typhi* abscess developing within a pre-existing simple hepatic cyst, suggesting that abnormal hepatic architecture may facilitate localised infection[6]. Jorge *et al* reported *Salmonella typhi* liver abscess developing in association with metastatic melanoma, suggesting malignancy-related susceptibility[7]. In the recent Tunisian case report, liver abscess occurred in a patient with cholecystitis and cholelithiasis, supporting a possible biliary route of infection[11]. In contrast, our patient had no apparent immunosuppression or major hepatobiliary predisposition, underscoring that clinically significant focal hepatic infection may occasionally occur in immunocompetent hosts.

Management of *Salmonella typhi* liver abscess follows established principles for pyogenic liver abscess: source control combined with targeted antimicrobial therapy. Our patient responded well to drainage and antibiotic therapy with complete clinical resolution, further supporting the pathogenic role of *S. typhi*.

Conclusion

Salmonella typhi should be recognised as a rare but important cause of pyogenic liver abscess. This case broadens the spectrum of extra-intestinal salmonellosis by demonstrating culture-confirmed hepatic abscess formation in an immunocompetent patient presenting without classical enteric fever or positive blood cultures. Careful microbiological evaluation of aspirated abscess material remains crucial for identifying unusual pathogens and guiding targeted treatment.

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