

**SUB DIAPHRAGMATIC ABSCESS DUE TO *SALMONELLA* TYPHI: A RARE CASE REPORT FROM SUB-HIMALAYAN REGION**

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**Abstract**

*Salmonella Typhi* causing sub diaphragmatic abscess is a rare entity. Intra abdominal abscess due to *salmonella* is usually associated with non typhoid *salmonella*. We report a rare case of sub diaphragmatic abscess due to *Salmonella Typhi* in an 80 years old diabetic man. Ultrasound guided drainage of fluid revealed pus cells on microscopy, and *S. Typhi* was cultured and identified by necessary biochemical tests and specific antisera. Patient succumbed to infection despite appropriate antibiotics, possibly due to co-morbid conditions. The case is presented for its rarity and to highlight atypical manifestations of *S. Typhi* in endemic regions.

**Keywords: Salmonella Typhi, Diaphragmatic, Sub Himalayan.**

**Introduction**

Enteric fever caused by *Salmonella enterica* var typhi (*S. Typhi*) and *Salmonella enterica* var paratyphi A, B and C (*S. Paratyphi* A, B and C) is endemic in Indian subcontinent and is one of the most common causes of travel associated illnesses.<sup>[1]</sup>The World Health Organization has estimated that annually typhoid fever accounts for 21.7 million cases and paratyphoid accounts for 5.4 million cases globally.<sup>[2]</sup>The infection is transmitted by feco-oral route in regions

with poor sanitary conditions and inadequate potable water supply. Patient typically presents at the end of first week with fever, dull headache and malaise with physical signs such as a tender abdomen, splenomegaly, hepatomegaly and relative bradycardia. If untreated there may be seeding of *salmonella* in different organs of the body subsequently presenting with abscess formation.<sup>[3]</sup> Antibiotic therapy is the mainstay of management of enteric fever and mortality in untreated patients is as high

as 30%, which falls to <1% with appropriate therapy.<sup>[4]</sup> Intra-abdominal abscess due to *salmonella* is a rare entity and is associated with a high mortality rate. We present here a rare case of sub diaphragmatic abscess due to *Salmonella* Typhi from sub-Himalayan region of North India, to highlight its unusual presentation.

### Case Report

An 80 years old male patient was admitted (in the emergency room of our institution) with the complaints of fever and pain upper abdomen for last four days. On examination he had fever of 39° C. His pulse rate was 96/minute. The patient was a known case of type 2 diabetes mellitus, hypertension, chronic kidney disease and cholelithiasis.

Abdominal examination revealed mild epigastric tenderness and liver was palpable 3 cm below the right coastal margin. The laboratory investigations revealed a total leukocyte count of 10,300 /mm<sup>3</sup> (N: 4,000-11,000/ mm<sup>3</sup>) with 80% neutrophils. Erythrocyte sedimentation rate was 40 mm in 1<sup>st</sup> hour (N: 0-20mm in 1<sup>st</sup> hour). Fasting blood sugar was 194 mg/ dL. Alkaline phosphatase, total serum bilirubin and transaminases were within normal limits. Blood urea was 110mg/dL (N: 20-40mg/dL) and creatinine was 5.3 mg/dL (N: 0.5-1.5mg/dL). Stool examination for *E. histolytica* was negative. There was no previous history of enteric fever. Two months back he was admitted in this institution with a diagnosis of acute cholecystitis with cholelithiasis. At that time he was treated with injection ciprofloxacin and discharged with a plan to do interval cholecystectomy after four weeks.

Ultrasound abdomen revealed collection in the right sub diaphragmatic region which was proved by computed tomography (CT) of abdomen (Figure1). Ultrasound guided drainage yielded 1300cc of thick tenacious pus and a pigtail catheter was placed for continuous drainage. The pus was sent for microbiological evaluation. Empirical therapy was started with piperacillin-

tazobactam and metronidazole. Grams staining showed multiple pus cells without microorganisms. Bacteriological culture yielded non lactose fermenting colonies on MacConkey agar. The organism was identified as *Salmonella* Typhi on the basis of Gram staining, motility, biochemical reactions and agglutination with polyvalent (poly O) and monovalent (O9) antisera (antisera- Central Research Institute, Kasauli, India). Antibiotic sensitivity testing was done by Kirby Bauer disc diffusion technique.<sup>[5]</sup> The organism was sensitive to cotrimoxazole, ceftriaxone, chloramphenicol and resistant to ampicillin, ciprofloxacin and nalidixic acid. Blood, urine and stool cultures were negative for *S. Typhi*. Widal test gave titre of 1:160 for ‘O’ and ‘H’ agglutinins of *S. Typhi*. The patient was diagnosed as a case of sub diaphragmatic abscess due to *Salmonella* Typhi. After culture and sensitivity report, he was switched over to injection ceftriaxone 2gm/day. Unfortunately, he continued to deteriorate and succumbed to his illness on the tenth day of admission.

### Discussion

Salmonellosis is an endemic problem in the developing countries. It usually presents as typhoid fever and gastroenteritis, and is associated with high morbidity and mortality in these regions. Fortunately with adequate treatment, most patients recover from acute phase of typhoid; however, 3-5% of individuals develop a chronic infection in gall bladder.<sup>[7]</sup>

Of the various extra intestinal manifestations of *Salmonella* Typhi, abscesses in various organs such as spleen, liver, subcutaneous tissue and skin are known, and are usually associated with specific clinical features of enteric fever. However, presence of *S. Typhi* abscesses without specific symptoms of typhoid are unusual. The pathogenesis of abscess formation is not well established. The possible causes may be infective bile from carriers to adjacent sites, hematogenous spread from distant site, and

lymphatic spread from gastrointestinal tract.<sup>[8]</sup>

The present case documents an unusual finding of sub diaphragmatic abscess caused by *salmonella* Typhi not associated with detectable bacteremia. The etiological factors in the development of the right sub diaphragmatic abscess in the present case can be only speculative.

Epidemiological studies conducted in endemic regions have indicated a strong link between development of typhoid carrier state and presence of gall stones.<sup>[9]</sup> Ours being an endemic region the possibility of subclinical infection leading into a chronic gall bladder carrier state cannot be ruled out as 25% carriers experience no clinical manifestations during acute infection.<sup>[10]</sup>

This patient presented with cholecystitis with cholelithiasis two months prior to the present admission for which he was managed with ciprofloxacin. It could be hypothesized that he had been a carrier of *Salmonella* Typhi harboring the organism in his gall bladder. He was not investigated for *Salmonella* infection at that time because it was not clinically suspected. We believe that the organism was not eradicated with the antibiotic (ciprofloxacin) given at that time and that congested gall bladder wall or silent perforation of the gall bladder allowed the escape of organisms into the peritoneal cavity. Alternatively, we can presume that a minor intestinal perforation occurred during the course of subclinical *Salmonella* infection which went unnoticed leading to seeding of bacteria into peritoneal cavity. Lowered immunity of this patient due to underlying disease such as diabetes mellitus and chronic renal disease might have increased his susceptibility to *Salmonella* infection.

Sub diaphragmatic abscess due to *Salmonella* is extremely rare, even in underlying co-morbid illnesses such as diabetes mellitus, lung disease, and almost all these case reports are due to non-typhoid *salmonella*.<sup>[11, 12]</sup> The causative organism

was not suspected until the culture report was obtained. In the era of antimicrobial drug resistance and emerging new infections, awareness about the atypical presentations of *S. Typhi* is essential to start a prompt laboratory diagnosis and specific treatment. A proper microbiological evaluation of the properly obtained specimens is mandatory in such unusual pyogenic infections.

#### Conclusion

Patient infected with *Salmonella* may not always have classical clinical features at the time of presentation. Physicians caring for patients in India and elsewhere in endemic areas should certainly keep in mind atypical presentations of typhoid fever. High index of suspicion, early diagnosis, adequate drainage and effective antibiotic treatment are the key points in managing sub diaphragmatic abscess due to *Salmonella* Typhi.

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Figure 1: Contrast enhanced axial CT scan showing sub diaphragmatic abscess causing scalloping of the anterior surface of liver

