Renal Abscess Caused by *Salmonella Typhi*

Amarjeet Kaur, Smita Sarma, Navin Kumar, Sharmila Sengupta

Department of Microbiology, Medanta - The Medicity, Gurgaon, Haryana, India

**Address for correspondence:** Dr. Amarjeet Kaur, E-mail: amar.k.kanjan@gmail.com

### ABSTRACT

*Salmonella typhi* is a true pathogen, which is capable of causing both intestinal and extraintestinal infections. Unusual presentations of *Salmonella* should always be kept in mind as this organism can cause disease in almost any organ of the body. *S. typhi* has been reported to cause the life-threatening infections such as meningitis, endocarditis, myocarditis, empyema, and hepatic abscess. Renal involvement by *S. typhi* is a relatively rare presentation. We report a case of renal abscess caused by *S. typhi* in an afebrile, 10-year-old child who did not have any clinical history of enteric fever. To our knowledge, this is the first reported case of isolation of *S. typhi* from the renal abscess, and interestingly this isolate was found to be resistant to quinolones.

**Key words:** Fluoroquinolones, renal abscess, *Salmonella typhi*

### INTRODUCTION

Typhoid fever caused by *Salmonella typhi* is endemic in many parts of India. Less commonly, extraintestinal infections can occur with *S. typhi*. These extraintestinal infections can involve liver, spleen, lung, bones, joints, endocardium, or central nervous system.[1-9] Genitourinary infections by *S. typhi* are relatively rare. A renal abscess is commonly caused by *Staphylococcus, Escherichia coli, Klebsiella*, and *Proteus*. There are documented reports of renal abscess caused by *Salmonella virchow*, *Salmonella enteritidis*, *Salmonella Typhimurium*, and *Salmonella paratyphi A*. [10-13] We report a case of renal abscess caused by *S. typhi*. In a PubMed/PubMed Central search of reported cases, there is no case of isolation of *S. typhi* from renal abscess so far. Interestingly, the isolate was found to be resistant to ciprofloxacin (minimum inhibitory concentration [MIC] ≥1 µg/ml).

### CASE REPORT

A 10-year-old male child, a known case of congenital atrophy of left kidney presented with complaints of mild pain in the right lumbar area of 3 days. He did not have any urinary symptoms, vomiting, jaundice, bladder, or bowel disturbance. The patient was afebrile and hemodynamically stable. General physical and systemic examinations were unremarkable except for flank tenderness on the right side. Laboratory investigations revealed hemoglobin: 11.1 g/dl and a total leukocyte count: 16.51 × 10^3/µl. Renal function tests were normal with blood urea: 33 mg/dl and serum creatinine: 0.7 mg/dl. Ultrasound kidney, ureter, bladder regions on the right side showed enlarged kidney (11.7 × 5.6) with hydronephrosis of the mid and lower poles with hydroureter. A cystic lesion was seen in mid pole with sedimenting hyperechoic...
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is a relatively rare
by VITEK 2 compact. Serotyping
[14]
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ureter (3) Small left kidney
kidney with multiple round hypodense lesions (2) Right sided dilated
Figure 1: we managed to do the Widal test on his serum sample,
presentation, his blood culture was not sent. However,
ciprofloxacin (MIC ≥ 1
sulfamethoxazole (MIC ≤ 20
cefoperazone‑sulbactam (MIC ≤ 8
found to be sensitive to ceftriaxone (MIC ≤ 1
was done to confirm the isolate. This isolate was
identified as Bacilli, which was
1g intravenous (IV) 3 times a day. Aspirate culture grew
nonlactose fermenting Gram-negative Bacilli, which was
identified as S. typhi by VITEK 2 compact. Serotyping
done to confirm the isolate. This isolate was
found to be sensitive to ceftriaxone (MIC ≤ 1 µg/ml),
cefoperazone-sulbactam (MIC ≤ 8 µg/ml), trimethoprim/
sulfamethoxazole (MIC ≤ 20 µg/ml) but resistant to
ciprofloxacin (MIC ≥ 1 µg/ml). As the patient was afebrile
and clinically there was no suspicion of enteric fever at
presentation, his blood culture was not sent. However,
we managed to do the Widal test on his serum sample,
which was stored in the lab following renal function
tests. Widal came out to be positive for S. typhi (O and H
antigens in the titer of 1:320). Treatment was continued
with IV cefoperazone-sulbactam till the 4th day of
his hospitalization as the isolate was sensitive to third
generation cephalosporins. Pain and flank tenderness
subsided, and the patient was discharged with an advice
to take cefixime 200 mg twice daily for 7 days. The patient
was asymptomatic on subsequent follow-up visits.

DISCUSSION

Typhoid is a major health problem, especially in developing
countries with poor sanitation where fecal contamination of
food and water is common. The most common infections
caused by S. typhi in humans are gastrointestinal infections,
but it is also capable of causing the extra-intestinal
infections. It can involve almost any organ in the body
producing different manifestations. Salmonella can affect
the central nervous system, cardiovascular system,
pulmonary system, bone, joints, hepatobiliary system, and
genitourinary system. There are few reported cases from
India on these extra-intestinal infections. In a study by
Gokul et al, 27 cases of central nervous system infection
by Salmonella were reported.[9] This organism can also cause
myocarditis, endocarditis, and less commonly pericarditis.[9]
It has also been reported to cause pleural empyema in
an 83-year-old male diabetic patient who presented with
fever, productive cough, and difficulty in swallowing.[4]
S. typhi can cause osteomyelitis by hematogenous spread,
contiguous source, or as a result of vascular insufficiency.
An association between S. typhi osteomyelitis and sickle cell
anemia has been seen.[4] S. typhi can involve a hepatobiliary
system and cases of S. typhi liver abscess have been reported
in the literature.[3‑2]

Genitourinary infection by S. typhi is a relatively rare
event, even in endemic areas. Predisposing factors for
genitourinary involvement include underlying structural or
functional abnormalities, calculi, pyelonephritis, dermoid
cyst, and renal transplant. S. typhi has never been implicated
in renal abscess, although renal involvement has been
reported.[14] Diagnosis is confirmed by culture of the
aspirated pus from the abscess.

Empiric treatment of renal abscess is started with
anti-staphylococcal drugs as it is the most common
causative agent. Once the culture and sensitivity reports
are available, treatment is modified accordingly.[3‑1] S. typhi,
usually shows good sensitivity to fluoroquinolones,
but quinolone resistance has emerged in developing

Figure 1: Computed tomography urography showing: (1) Enlarged right kidney with multiple round hypodense lesions (2) Right sided dilated ureter (3) Small left kidney
countries due to the widespread availability of inexpensive fluoroquinolones. Our isolate was also resistant to ciprofloxacin. Third generation cephalosporins can be used in cases showing resistance to fluoroquinolones. Other antibiotics that have been reported to be used successfully are chloramphenicol, co-trimoxazole, and azithromycin. Chloramphenicol should be reserved for the infections caused by *S. typhi* when less toxic antimicrobials are ineffective or contraindicated. In case of perinephric abscess drainage procedure is also required in addition to antibiotics.\(^{[15,16]}\) Salmonellosis continues to be a major public health problem in developing countries, therefore, unusual clinical presentations of *Salmonella* should be kept in mind.

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**Conflicts of interest**

There are no conflicts of interest.

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