

CASE REPORT

Beyond Gastroenteritis: Exploring Atypical Urinary Tract Infection in Salmonellosis: A Rare Case Report

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Abstract

Urinary tract infection (UTI) caused by *Salmonella* is rare, constituting only 0.01% to 0.1% of UTI cases. This case report highlights an uncommon presentation of Salmonellosis in staghorn calculi with urinary tract infection (UTI). This case report emphasises the importance of considering *Salmonella* as a potential pathogen in unusual clinical scenarios. Prompt recognition and appropriate intervention are crucial, especially in vulnerable populations. Diagnosis often involves microbiological analysis, with treatment tailored based on antibiotic susceptibility testing. Heightened awareness among healthcare providers is essential for early detection and management of atypical *Salmonella* infections to mitigate complications.

Keywords: Atypical salmonellosis, Salmonella UTIs, Paratyphi B in UTI, Salmonella bacteriuria, Salmonella in pyelonephritis.

Introduction

Enteric fever is the most prevalent clinical manifestation of the genus *Salmonella*.^[1] However, atypical presentations are possible and can pose diagnostic as well as therapeutic challenges. Past instances have showcased atypical presentations, including breast abscesses, mycotic aneurysms, urinary tract infections and cholecystitis caused by various *Salmonella* species, which were difficult to detect and treat.^[2,3] These variations can manifest as less severe symptoms to life-threatening illnesses lacking the typical features such as prolonged high-grade fever, constipation, diarrhea, headache, abdominal pain, and rose spots.^[4]

Identifying such atypical presentations is particularly challenging, especially in vulnerable populations like infants, older people, and individuals with compromised immune systems.^[5-7] Timely recognition and appropriate intervention are crucial for managing atypical *Salmonella* infections and mitigating potential complications.^[8]

The occurrence of *Salmonella* causing urinary tract infections (UTIs) is rare, representing only 0.01% to 0.1% of UTI cases.^[9] Complications such as pyelonephritis, genitourinary abscess, and recurrence can occur if left untreated. This case report will highlight the atypical *Salmonella* presentation in stag horn calculi with UTI. It is being reported because of its rarity.

Case Report

A 56-year-old man who is a known case of type two diabetes and systemic hypertension for ten years under medications visited the surgical outpatient department with complaints of fever (100^o F) for two days along with lower abdominal pain, urinary retention, and dysuria for a week duration. The pain was sudden in onset, intense in nature, and radiating to the back. The vitals were stable on local examination, and the patient was conscious and oriented. On systemic examination, the abdomen was soft and tender over the left iliac region. The patient did not

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have a history of hematuria, nausea, vomiting or passing of cloudy urine. The patient was admitted for pain in the abdomen for further evaluation and management.

Upon admission, investigations for complete blood counts, urine routine, and Culture and sensitivity were sent. The patient was empirically started on intravenous Ceftriaxone 1g BD in view of urinary tract infection. Radiological investigations, such as Ultrasound and Computed Tomography - Kidneys, Ureters, and Bladder (CT-KUB), were done. Baseline investigations were normal; however, the urine analysis revealed the presence of ketone bodies and elevated leucocytes (pus cells >25/high-power field) and the culture report was awaited. Imaging studies revealed the presence of left renal staghorn calculus with pyelonephritis. In view of worsening symptoms, the patient underwent a percutaneous nephrolithotomy, which was uneventful.

The blood culture was reported to be sterile, and the stool cultures showed normal flora. The urine culture report showed moderate pus cells, few epithelial cells, and moderate gram-negative bacilli in the gram stain, as shown in *Fig 1*. The sample showed 10^5 colony-forming units per millilitre (CFU/mL) of non-lactose fermenting colonies in Cysteine Lactose Electrolyte Deficient agar (CLED), as shown in *Fig 2*. The organism was identified as *Salmonella enterica subsp. enterica*, serotype Paratyphi B with 1,00,000 CFU/ml through the Vitek2 Compact (bioMérieux, France), which was then confirmed through sero-agglutination test using anti-sera against O and H antigens of *S. Typhi* and *S. Paratyphi A* and *B*.

Upon performing antimicrobial susceptibility testing (AST) by disk diffusion (DD) on Mueller–Hinton agar (MHA), the organism was found to be susceptible to ampicillin, co-trimoxazole, ceftriaxone, tetracycline, and

ciprofloxacin without any resistance based on Clinical and Laboratory Standards Institute (CLSI guidelines). Given the positive culture status, the patient was continued on parenteral Ceftriaxone (1g) twice daily for two weeks. The repeat urine culture was sterile. Upon recovery, the patient was discharged and was advised for follow-up in the outpatient department.

Discussion

Salmonella species can be isolated from urine after recent enteric fever episodes in chronic carriers with genitourinary tract involvement. However, isolation of *Salmonella* species in UTI is rare, and they are typically encountered in patients with underlying urologic abnormalities or immunosuppression. Factors like immune suppression, chronic conditions such as diabetes, and urological issues such as urolithiasis and bladder abnormalities increase the risk of UTIs.^[3] Our patient presented with renal calculi, which could have complicated the UTI and led to pyelonephritis, as seen in our case. Therefore, it is essential to evaluate underlying abnormalities of the genitourinary tract or immunosuppression in seemingly healthy individuals with *Salmonella* bacteriuria.^[7,9,10] It's worth noting that cases have been observed in individuals without immune suppression and may result from hematogenous spread from gastroenteritis or direct urethral faecal contamination.

Initial treatment for *Salmonella* bacteriuria involves administering intravenous ceftriaxone, fluoroquinolone, ampicillin, or cotrimoxazole for 1 to 2 weeks, with the possibility of extending the duration to 6 weeks for severe cases.^[8] Early treatment with the appropriate antibiotics

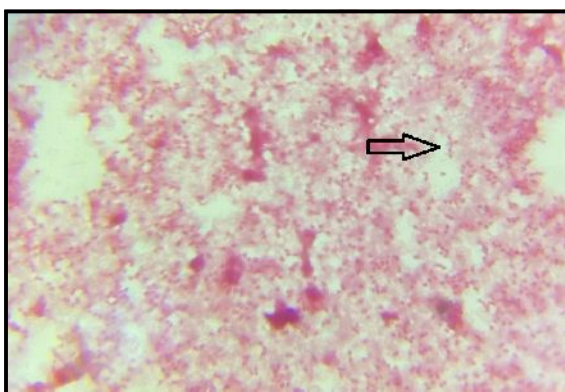


Fig 1. Gram stain showing Gram-negative bacilli.

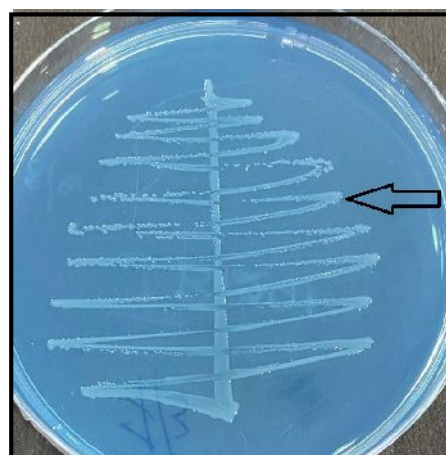


Fig 2. Cysteine Lactose Electrolyte Deficient agar (CLED) showing non-lactose fermenting colonies.

is associated with a favorable prognosis. Repeat urine cultures are imperative to confirm the efficacy of the treatment. Recurrence is still possible despite extended therapy, so early antibiotic initiation is crucial.

Conclusion

In summary, while urinary tract infections (UTIs) caused by *Salmonella* are rare, they usually occur in patients with preexisting urological conditions. Therefore, assessing any underlying abnormalities in the genitourinary tract or potential immune system suppression in apparently healthy individuals with *Salmonella* bacteriuria is important. Additionally, a longer duration of antimicrobial therapy using effective antibiotics is necessary.

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