

Case Report

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Bilateral Salmonella Epididymo-Orchitis as the Presenting Manifestation of Undiagnosed HIV Infection: A Case Report

Anastasios Dimou^{1*}, Maria Beltsiou², Ilias Kanakakis¹, Dimitrios Tzortzakakis¹ and Stavros Tzoulakis¹

¹Urology Department, Venizeleio General Hospital of Heraklion, Heraklion, Crete, Greece

²Family Medicine Department, Venizeleio General Hospital of Heraklion, Heraklion, Crete, Greece

ABSTRACT

Background: Non-typhoidal Salmonella (NTS) is a predominant cause of foodborne gastroenteritis worldwide but rarely produces invasive urogenital infections. NTS-induced epididymo-orchitis has been reported in fewer than 20 cases in the literature, all unilateral, predominantly in immunocompromised individuals. Bilateral NTS epididymo-orchitis has not previously been reported, and its association with newly diagnosed HIV infection makes this case unique.

Case Summary: A 42-year-old male presented with a 3-day history of bilateral scrotal pain, erythema, and fever. Laboratory investigations showed leukocytosis (WBC 12,100/mm³), markedly elevated CRP (19.4 mg/dL), and heavy pyuria (463 WBC/HPF). Scrotal Doppler ultrasound confirmed bilateral epididymo-orchitis without abscess. Urine culture yielded *Salmonella enterica*, sensitive to fluoroquinolones. HIV-1/2 serology was reactive with a positive viral load (737.21 copies/mL). Oral ciprofloxacin 500 mg twice daily was administered for 4 weeks, resulting in complete clinical and biochemical resolution. No recurrence was observed at 6 months. The patient was referred for antiretroviral therapy.

Conclusion: This case is the first documented report of NTS bilateral epididymo-orchitis in an HIV-positive patient and reinforces the need to consider immunosuppression — including undiagnosed HIV — when atypical uropathogens are identified. A minimum 4-week course of fluoroquinolone therapy is recommended.

*Corresponding author

Anastasios Dimou, Urology Department, Venizeleio General Hospital of Heraklion, Heraklion, Crete, Greece.

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Introduction

Epididymo-orchitis refers to infectious or inflammatory involvement of the testis and epididymis, which may affect either structure in isolation or both simultaneously. Regardless of the precise anatomical distribution, these conditions collectively represent the leading infectious cause of acute scrotal pain in adult males, with more than 600,000 medical visits per year in the United States [1].

Causative pathogens differ by age group. Sexually transmitted organisms — *Chlamydia trachomatis* and *Neisseria gonorrhoeae* — are the principal agents in men aged 14 to 35, while *Escherichia coli* and other urinary tract pathogens dominate in those younger than 14 or older than 35. In HIV-positive patients and those with AIDS, the aetiological spectrum is broader and includes fungal species and viral pathogens such as mumps or cytomegalovirus [2]. In patients with immune deficiencies, including HIV and severe malnutrition, there are a number of less well-known nontyphoidal *Salmonella* species (NTS) that cause extraintestinal disease, such as urinary tract infection (UTI), however, rarely leading to orchitis/

epididymitis [3]. Tena et al. mentioned that UTI due to NTS is itself uncommon, accounting for approximately 0.07% of all positive urine cultures [4]. NTS-induced epididymo-orchitis in adults is extraordinarily rare with some sporadic case reports in the literature over the years and all previously described as unilateral [3-11].

The pathogenetic mechanisms underlying NTS urogenital involvement are not fully established but are thought to involve two principal routes: ascending infection from a colonized urinary tract and hematogenous seeding of testicular parenchyma following invasive bacteremia [5]. In recent years, NTS bacteremia has been increasingly reported as a cause of life-threatening infection in immunocompromised hosts. It is worth noting that, Dhanoa et al. mentioned in their study that malignancy and HIV/AIDS were the two most common conditions associated with NTS bacteraemia [12].

Any acute scrotum requires prompt exclusion of testicular torsion [2]. Epididymitis classically presents with gradual-onset posterior scrotal pain that may extend to the adjacent testis and lower abdomen, often accompanied by urinary symptoms and fever [2]. It does not know a preferential side but it is bilateral in nearly 10% of cases [13]. The cremasteric reflex is typically preserved,

and Prehn's sign may be positive, but neither finding is reliable enough to confirm the diagnosis without further investigation [14]. The scrotal Doppler ultrasound is systematically performed in the event of clinical suspicion of epididymo-orchitis allowing both to confirm the diagnosis and to eliminate the differential diagnoses (torsion, necrotic tumor) and complications (abscess, vascular anomaly) and allows also to orient the diagnosis towards the nature of the germ in certain particular situations [15].

Antibiotic treatment of Salmonella UTI is fraught with difficulty due to the high frequency of complicating conditions. Prolonged courses of antibiotics are indicated to prevent chronic bacteriuria, relapse or bacteremia, especially in patients with urologic abnormalities or immunosuppression [4]. A major concern regarding treatment with fluoroquinolones, and indeed all antibiotics, is the risk of emergence of resistance and outbreaks of infections due to resistant organisms, which could potentially cause serious extraintestinal infections in high risk groups [16]. We present a case of NTS bilateral epididymo-orchitis in an HIV-positive patient, with the aim of raising clinical awareness of this rare complication and reviewing the relevant diagnostic and therapeutic evidence.

Case Presentation

A 42-year-old male with no previously documented medical history presented to the emergency department reporting a 3-day history of bilateral scrotal pain and subjective fever. He denied preceding diarrhea, nausea, vomiting, or abdominal pain. He had not traveled internationally in the preceding 3 months. He defined as heterosexual and denied any known sexual risk factors for sexually transmitted infections and reported no prior episodes of epididymo-orchitis or urological disease.

On clinical examination, his vital signs on admission were: temperature 37.2°C, heart rate 88 bpm, blood pressure 128/82 mmHg, respiratory rate 16 breaths per minute. Scrotal examination revealed bilateral erythema, marked edema, and exquisite tenderness to palpation of both epididymides and testes. No scrotal wall thickening, fluctuance, or necrosis was identified. The inguinal regions were non-tender with no palpable lymphadenopathy. Abdominal and rectal examination were unremarkable.

Laboratory investigations revealed a white blood cell count of 12,100/mm³ with neutrophilia (85%), CRP of 19.4 mg/dL (reference < 0.5 mg/dL), and erythrocyte sedimentation rate of 68 mm/hour. Renal function and liver enzymes were within normal limits. Urinalysis demonstrated gross pyuria (463 WBC/HPF), with no hematuria or bacteriuria on dipstick. Scrotal Doppler ultrasound demonstrated bilateral epididymal enlargement with markedly increased vascularity on color Doppler imaging, consistent with bilateral acute epididymo-orchitis. No intratesticular or extratesticular abscess, testicular infarction, or hydrocele was identified. Both testes demonstrated normal echogenicity without focal lesions.

Two sets of blood cultures and a urine culture were obtained before starting antibiotics. The patient was commenced on intravenous Ciprofloxacin 400mg twice daily, Diclofenac 75mg once daily and scrotal elevation. Mid-stream urine sent for culture yielded a pure growth of *Salmonella enterica*, resistant to ampicillin and trimethoprim-sulfamethoxazole, and sensitive to fluoroquinolones and third-generation cephalosporins. Both blood cultures showed no growth at 5-day incubation. Culture of the stool specimens was retrieved also but it did not yield *Salmonella* spp. Given the identification of *Salmonella* as a uropathogen — an unusual

finding in a patient with no prior urological history or recent gastrointestinal illness — a comprehensive infectious disease workup was undertaken. HIV-1/2 combined antigen/antibody testing was reactive, with a confirmatory quantitative HIV-1 RNA viral load of 737.21 copies/mL. CD4+ T-Cell count was subsequently obtained. The patient showed clinical and laboratory improvement and was discharged after 7 days of intravenous antibiotic treatment. Afterwards, he completed a 4-week course of oral ciprofloxacin 500 mg twice daily without adverse effects. Clinical symptoms — bilateral scrotal pain, erythema, and swelling — had resolved completely by day 14 of treatment. At the 4-week follow-up appointment, CRP had normalized (0.3 mg/dL) and white cell count was within normal limits. Follow-up scrotal ultrasound at 6 weeks demonstrated normal bilateral testicular and epididymal morphology with no evidence of residual inflammation, abscess, or testicular atrophy. At 6 months of follow-up, the patient remained asymptomatic with no recurrence of orchitis. He had successfully engaged with the infectious disease outpatient clinic, initiated antiretroviral therapy, and was responding with improving CD4+ counts.

Discussion

The present case is the first documented instance of NTS bilateral epididymo-orchitis in an HIV-positive patient, representing a doubly unique clinical scenario: bilateral involvement and immunosuppression-related NTS invasive disease in the same host. A thorough review of the literature identifies fewer than 20 reported cases of NTS male genital infections in total, all describing unilateral disease across a range of immunosuppressive backgrounds including diabetes mellitus, malignancy and HIV infection [3-11].

The absence of diarrhea in our patient is consistent with prior reports of invasive NTS in HIV-positive individuals, where the gastrointestinal prodrome is frequently lacking — a pattern that delays diagnosis and serves as an independent marker of underlying immunosuppression and poor prognosis [17]. Underlying immunosuppression should be excluded in patients presenting with NTS bacteremia in the absence of gastroenteritis [18]. Notably, HIV infection increases the risk of *Salmonella* bacteremia 20 to 100 times and mortality as much as seven times compared to people who do not have HIV [19]. The unusual microbiological finding was what prompted HIV screening in our patient, leading to an incidental diagnosis that would otherwise have been missed, and the bilateral scrotal involvement itself likely reflects just how severely immunocompromised he was at the time of presentation.

The treatment landscape for NTS infections has shifted considerably over time, moving away from the traditional agents chloramphenicol, ampicillin, and co-trimoxazole as multidrug resistance emerged in the 1980s, with fluoroquinolones and extended-spectrum cephalosporins becoming the preferred alternatives, though resistance to these newer agents has also been increasingly reported worldwide [17]. In patients with severe disease, treatment with empiric intravenous ceftriaxone is recommended until antimicrobial susceptibility results are available [19]. Extended antibiotic durations of at least 2-6 weeks are recommended in HIV patients with invasive NTS infections to minimize the risk of bacteriological relapse [19]. Surgical management, including scrotal exploration, drainage of abscess, or orchiectomy, was not required in our case given the prompt and complete response to antibiotics; surgery is reserved for complications such as abscess formation or failure of medical therapy [3,11].

This case adds to the very small body of literature on NTS epididymo-orchitis and represents a unique clinical phenotype. Larger case series and prospective studies are needed to better define the epidemiology, optimal treatment duration, and long-term outcomes in immunocompromised patients with invasive NTS urogenital infections.

Conclusions

Non-typhoidal *Salmonella* epididymo-orchitis is a rare but clinically significant entity, particularly in immunocompromised hosts. This case represents the first documented report of bilateral NTS epididymo-orchitis in an HIV-positive patient, highlighting the increased susceptibility of HIV-infected individuals to invasive and atypical presentations of NTS infection. The bilateral scrotal involvement in this case likely reflects the severity of underlying immune dysfunction at presentation.

Management of NTS epididymo-orchitis should include urine, stool and blood cultures and a long course of antibiotics in immunocompromised patients. A critical clinical lesson from this case is that the identification of an unusual uropathogen and absence of obvious predisposing urological factors should systematically prompt investigation for underlying immunosuppression, including HIV. Early HIV diagnosis in our patient allowed timely initiation of antiretroviral therapy and infectious disease follow-up, which are essential for immune reconstitution and prevention of recurrence.

Ethics Statement

Written informed consent was obtained from the patient for the publication of this case report and any accompanying data, in accordance with the principles of the Declaration of Helsinki. Patient anonymity has been preserved throughout.

Conflicts of Interest

The authors declare no conflicts of interest

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Author Contributions

Anastasios Dimou: Original draft. Maria Beltsiou, Ilias Kanakakis: Material preparation and data collection. Dimitrios Tzortzakakis, Stavros Tzoulakis: Manuscript revision. Charalampos Belantis, George Rovithis: Validation. Ioannis Heretis: Supervision, final approval. The first draft of the manuscript was written by Anastasios Dimou and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

References

1. Velasquez J, Boniface MP, Mohseni M (2025) Acute scrotum pain. StatPearls Publishing, Treasure Island.
2. Trojian TH, Lishnak TS, Heiman D (2009) Epididymitis and orchitis: an overview. *American Family Physician* 79: 583-587.
3. Arshed M, Javed A, Ahmad M, Malik A (2015) An unusual case: *Salmonella* UTI and orchitis in HIV patient. *Case Rep Med* 2015: 216720.
4. Tena D, González Praetorius A, Bisquert J. (2007) Urinary tract infection due to non-typhoidal *Salmonella*: report of 19 cases. *J Infect* 54: 245-249.
5. Bansal N, Kaistha N, Chander J (2012) Epididymo-orchitis: an unusual manifestation of salmonellosis. *J Microbiol Immunol Infect* 45: 318-320.
6. Lalitha MK, John R (1994) Unusual manifestations of

salmonellosis--a surgical problem. *Q J Med* 87: 301-309.

7. Ejlersten T, Jensen HK (1990) Orchitis and testicular abscess formation caused by non-typhoid salmonellosis. A case report. *APMIS* 98: 294-298.
8. Svenungsson B (1984) Suppurative epididymo-orchitis due to *Salmonella enteritidis*. *J Infect* 8: 64-66.
9. Al-Obeid K, Al Khalifan NN, Jamal W, Kehinde EO, Rotimi VO (2006) Epididymo-orchitis and testicular abscess caused by *Salmonella enteritidis* in immunocompromised patients in Kuwait. *Med Princ Pract* 15: 305-308.
10. Noble MA, Chan V (1988) Ciprofloxacin treatment of *Salmonella* hadar epididymo-orchitis. *J Antimicrob Chemother* 21: 383-384.
11. Cohen JI, Bartlett JA, Corey GR (1987) Extra-intestinal manifestations of salmonella infections. *Medicine* 66: 349-388.
12. Dhanoa A, Fatt QK (2009) Non-typhoidal *Salmonella* bacteraemia: epidemiology, clinical characteristics and its' association with severe immunosuppression. *Ann Clin Microbiol Antimicrob* 8: 15.
13. Kbirou A, Alafifi M, Sayah M, Dakir M, Debbagh A, et al. (2022) Acute orchiepididymitis: Epidemiological and clinical aspects: An analysis of 152 cases. *Ann Med Surg (Lond)* 75: 103335.
14. Nöske HD, Kraus SW, Altinkilic BM, Weidner W (1998) Historical milestones regarding torsion of the scrotal organs. *J Urol* 159: 13-16.
15. Schull A, Monzani Q, Bour L, Barry Delongchamps N, Beuvon F, et al. (2012) Imaging in lower urinary tract infections. *Diagn Interv Imaging* 93: 500-508.
16. Onwuezobe IA, Oshun PO, Odigwe CC (2012) Antimicrobials for treating symptomatic non-typhoidal *Salmonella* infection. *Cochrane Database Syst Rev* 11: 001167.
17. Gordon MA (2008) *Salmonella* infections in immunocompromised adults. *J Infect* 56: 413-422.
18. Ramos JM, Garcia-Corbeira P, Aguado JM, Arjona R, Ales JM, et al. (1994) Clinical significance of primary vs. secondary bacteraemia due to nontyphoidal *Salmonella* in patients without AIDS. *Clin Infect Dis* 19: 777-780.
19. (2026) National Institutes of Health, Centers for Disease Control and Prevention, HIV Medicine Association of the Infectious Diseases Society of America Panel on Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents with HIV—A Working Group of the Office of AIDS Research Advisory Council (OARAC). Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV. US Department of Health and Human Services <https://www.ncbi.nlm.nih.gov/books/NBK586304/>.

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