



CASE REPORT

Epididymo-orchitis: An unusual manifestation of salmonellosis

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Salmonellosis continues to be a major public health problem, especially in developing countries. The formation of focal abscesses may occur following either hematogenous or lymphatic spread. There are large number of serious and life-threatening clinical manifestations of *Salmonella* spp., ranging from osteomyelitis to infective endocarditis and meningitis. However, even though *Salmonella* epididymo-orchitis is a relatively rare clinical manifestation, it can present, most often in male babies and adolescent boys, following contact with nontyphoidal *Salmonella*. Here, we report a case of epididymo-orchitis due to *Salmonella* Paratyphi A that presented in an otherwise healthy 63-year-old man in order to highlight this organism's unusual clinical presentation. In countries such as India, where *Salmonella* infections are endemic, a high index of suspicion should be always be maintained and the possibility of a *Salmonella* infection at an aberrant site where it is hardly expected should not be ruled out.

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Introduction

Salmonellosis is a major public health problem, especially in developing countries. Classic enteric fever is caused by *Salmonella* Typhi and the usually less severe enteric fevers are caused by *S* Paratyphi A, B, or C.¹ However, at times *S*. Paratyphi A is capable of causing serious and often life-threatening infections such as infective endocarditis, pericarditis, empyema, sinovenous thrombosis, osteomyelitis,

meningitis, bone marrow infiltration, hepatitis, and pancreatitis.¹ There are anecdotal case reports in the medical literature of abscesses being caused by this organism, mostly nontyphoidal *Salmonella*; however, *S* Paratyphi A has never been implicated in causing epididymo-orchitis.^{2–8} Here, we report a case of epididymo-orchitis that was caused by *S* Paratyphi A in an otherwise healthy adult male.

Case report

A 63-year-old man presented at the Outpatient Department of Surgery of our 750-bed tertiary care hospital in North India. The patient complained of a 1-week history of

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progressive swelling of the right testicle, which was associated with localized pain, mild dysuria, and low-grade fever. Apart from this, there were no other relevant symptoms. His general physical and systemic examinations were unremarkable. Scrotal examination revealed the right testicle to be enlarged, hot, erythematous, and tender. A diagnosis of epididymo-orchitis was made. Upon investigation, the patient's hemoglobin level was 10.8 g/dL, total leukocyte count was 8900/ μ L (57% polymorphs, 41% lymphocytes, 1% monocytes, and 1% eosinophils), with a normal platelet count, blood sugar levels, and liver and renal functions. Routine examination of the urine was normal. He was empirically started on twice-daily administrations of 500 mg oral ciprofloxacin. Surgical incision and drainage were performed, and a pus specimen was sent to the microbiology laboratory for culturing. Blood and urine cultures were sterile; however, pus drained from the abscess yielded pure bacterial growth, which was identified as *S* Paratyphi A. The isolate was sensitive to ceftazidime, ceftriaxone, chloramphenicol, amikacin, ciprofloxacin, and cotrimoxazole but resistant to ampicillin and nalidixic acid. The patient's Widal test was found to be positive for *S* Paratyphi A (O and H antigens in titers of 1:160 and 1:320, respectively). On Day 3 of follow up, treatment was modified to a once-daily administration of 1 gm intravenous ceftriaxone based on the culture and sensitivity reports. The patient's clinical condition improved after 1 week of ceftriaxone administration and oral ofloxacin was continued for an additional 4 weeks. The patient recovered uneventfully and was still in good health, with no recurring symptoms, on follow-up examinations performed 6 months after the completion of therapy.

Discussion

Salmonella causes a broad-spectrum of human illnesses, from gastroenteritis, typhoid fever, and bacteremia to the asymptomatic carrier state. There are a large number of reports describing the isolation of *Salmonella* spp. following the presentation of a variety of clinical symptoms at aberrant sites where they were hardly expected. Focal abscess formation may occur by either haematogenous or lymphatic spread. *Salmonella*, after surpassing gastric defenses, can proliferate within macrophages and escape phagocytosis by neutrophils and disseminate throughout the body, causing protean clinical manifestations.⁹

Salmonella epididymo-orchitis is a relatively rare clinical entity. In a review of more than 700 cases of extra-intestinal *Salmonella* infections, only 1.4% cases were found to present as epididymo-orchitis.¹ Epididymitis and orchitis are often the direct extension of an infection that initially presented elsewhere, such as the urinary tract, but in tuberculous and/or viral infections haematogenous spread is often the cause.¹⁰ A bacteriological cause of epididymo-orchitis should always be investigated, but *Salmonella* spp. is usually the least likely bacterial cause, especially in a healthy male without any predisposing factors such as hemoglobinopathies (e.g., sickle cell disease), previous trauma, immunosuppressive therapy, or impaired cell-mediated immune responses (e.g., AIDS). In most cases, the etiology of *Salmonella* is never suspected

based on clinical symptoms, and diagnosis is usually made only after its isolation.^{1,9}

Very few cases of epididymo-orchitis due to *Salmonella* have been reported worldwide. Out of 7779 cases of salmonellosis evaluated at New York Salmonella Center, it is noteworthy that there was not even a single case of epididymitis and/or orchitis.² In another large study of 6,250 patients with salmonellosis in India, one case of *Salmonella* infection in a pre-existing hydrocele and a case of epididymo-orchitis with loculated *Salmonella* infection have been reported.¹¹ In an electronic review of the medical literature, only a few sporadic cases of epididymo-orchitis with *Salmonella* etiology have been recorded, mainly in infants, and these cases were mostly caused by nontyphoidal *Salmonella*.²⁻⁸ This demonstrates the rarity of the very cause of this disease. To the best of our knowledge, this is probably the first case of epididymo-orchitis due to *S* Paratyphi A. The most probable route of infection implicated in our case is haematogenous spread. An etiological diagnosis was confirmed by culturing the aspirated pus from the abscess. An attempt should always be made to aspirate as much pus as possible at the time of diagnosis in order to reduce toxemia.

Treatment was empirically started and once the culture and sensitivity reports were available, antimicrobial therapy was modified accordingly. Parenteral therapy is recommended for at least 7 days followed by oral antibiotics for at least 4 weeks, as was given to our patient. Ciprofloxacin has better penetrative capability compared with ceftriaxone for treating *Salmonella* epididymo-orchitis; however, because the isolate is resistant to nalidixic acid, clinical failure following the use of ciprofloxacin is quite common.¹²⁻¹⁴ To avoid this complication, intravenous ceftriaxone was preferred to intravenous ciprofloxacin for treating this patient because a high degree of resistance to nalidixic acid is encountered in *Salmonella* isolates at our center.¹⁵ The patient responded well to this treatment regimen, and his symptoms improved and his fever abated.

Salmonella is notorious for causing infections at unusual sites. Cases such as the one reported here highlight this problem. Clinicians and surgeons should be aware of this form of its presentation. Therefore, a high index of suspicion should be maintained and the possibility of *Salmonella* infection at aberrant sites should be not ruled out, especially in endemic countries.

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