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Salmonellosis Presenting with Septic Arthritis and Osteomyelitis: A Case Report

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Abstract

Aims: To describe an unusual and severe presentation of non-typhoidal salmonellosis involving multiple atypical anatomical sites in an elderly immunocompromised patient, and to highlight the diagnostic and therapeutic challenges associated with this condition.

Study Design: Single case report.

Place and Duration of Study: The case was managed at a tertiary care hospital. The patient was followed from initial presentation at the emergency department through surgical intervention and outpatient orthopedic follow-up, over a period of approximately four months.

Methodology: Clinical data were obtained from the patient's medical records, including laboratory results, microbiological cultures, imaging studies, surgical reports, and outpatient follow-up records.

Results: A woman in her 80s, immunocompromised due to prolonged corticosteroid therapy for organizing pneumonia, presented with right inguinal pain and functional limitation of gait, without fever or gastrointestinal symptoms. Blood and urine cultures were positive for non-typhoidal Salmonella group D. Despite targeted antibiotic therapy, inflammatory markers worsened. Advanced imaging revealed right iliopsoas abscesses, septic arthritis, and osteomyelitis of the right proximal femur. Management included an eight-week course of ampicillin combined with proximal femoral osteotomy, surgical joint debridement, and placement of antibiotic-loaded spacers, followed by total right hip arthroplasty. The patient showed favourable clinical and laboratory evolution.

Conclusion: This case highlights the potential for non-typhoidal Salmonella to cause severe disseminated infection involving atypical anatomical sites, particularly in immunocompromised patients and even without classic gastrointestinal symptoms. Early microbiological diagnosis, advanced imaging, and a multidisciplinary approach are essential when response to initial antibiotic therapy is inadequate.

Keywords: Salmonellosis; Septic arthritis; Osteomyelitis; Non-typhoidal Salmonella; Iliopsoas Abscess; Corticosteroid Therapy; Immunosuppression; Case Report

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Introduction

Salmonellosis is an infection caused by Salmonella bacteria, which are Gram-negative bacilli belonging to the Enterobacteriaceae family. Although self-limiting gastroenteritis is the most common foodborne illness caused by non-typhoidal Salmonella, it can also lead to more severe manifestations, including bacteremia, endovascular involvement, and focal infections. Among these, focal infections, such as septic arthritis, are relatively uncommon [1].

Several factors can increase susceptibility to salmonellosis, including extremes of age (such as infancy and advanced age), disruption of the intestinal microbiota due to antibiotics or surgical procedures, and underlying conditions such as diabetes, malignancies, and rheumatologic diseases (e.g., systemic lupus erythematosus) [1]. Additional risk factors include the use of biologic therapies, impaired reticuloendothelial function (as seen in malaria, sickle cell disease, or bartonellosis), Human Immunodeficiency Virus infection, corticosteroid therapy, and other forms of immunosuppression [1]. Non-typhoidal Salmonella has the potential to disseminate through the bloodstream and infect nearly any anatomical location [1].

In this report, we examined the case of a patient in her 80s who presented with unspecific symptoms, such as pain in the inguinal region with functional limitation of gait. The goal of this case report is to gain more insight into the complications of salmonellosis.

Research Focus

Rare osteoarticular complications of non-typhoidal salmonellosis in an immunocompromised host.

Research Aim

To describe an atypical presentation of invasive salmonellosis and highlight the importance of early recognition and multidisciplinary management of focal complications in immunocompromised patients.

Case Presentation

Background

A woman in her 80s presented to the emergency department with pain in the right inguinal region radiating to the thigh and associated with functional limitation of gait. The patient reported no history of fever but mentioned diaphoresis and chills. She denied having lumbar pain, trauma, urinary, gastrointestinal or respiratory symptoms.

Regarding the patient's medical history, in addition to cardiovascular risk factors such as hypertension and dyslipidemia, the patient was undergoing corticosteroid therapy (prednisolone regimen) for the treatment of organizing pneumonia. She was being followed in the pulmonology outpatient clinic, and corticosteroid treatment had been ongoing for approximately two months, having initiated at a dose of 60 mg per day with a progressive taper.

On physical examination, the only relevant finding was tenderness on palpation of the area inferior to the inguinal ligament and at the root of the thigh, associated with pain and functional impairment during thigh mobilization.

Research Problem

This case illustrates the diagnostic and therapeutic challenges posed by invasive non-typhoidal salmonellosis in an elderly immunocompromised patient. Osteoarticular manifestations of *Salmonella* infection, including septic arthritis, osteomyelitis, and iliopsoas abscess, are rare and frequently underrecognized, particularly in the absence of classic gastrointestinal symptoms. The immunosuppressive effects of prolonged corticosteroid therapy significantly increased this patient's susceptibility to invasive infection, highlighting the importance of considering atypical pathogens in this population. Furthermore, the complex interplay between infectious, orthopaedic, and pulmonological management underscores the need for a structured multidisciplinary approach in such cases.

Objectives

To describe an unusual presentation of non-typhoidal salmonellosis manifesting as right iliopsoas abscess and right proximal femur septic arthritis and osteomyelitis in an elderly patient immunocompromised by corticosteroid therapy; discuss the diagnostic challenges and the role of imaging in establishing the diagnosis, and highlight the importance of multidisciplinary management in achieving a favorable clinical outcome.

Results

Laboratory test results confirmed a proinflammatory state with increased C-Reactive Protein (CRP = 29.72 mg/dl) and procalcitonin (PCT = 10.72 ng/ml) levels. The white blood cell count was initially normal (5.75×10^9/L) but already presented with 84.5% of neutrophils. She had positive urine and blood cultures for Salmonella group D (not

typhi, not paratyphi). Upon questioning, she only reported having consumed eggs that had been given to her by a neighbor the week prior to her presentation to the emergency department. No other household members were reported to be ill.

Initial abdominal and pelvic computed tomography demonstrated enlargement and increased prominence of the right iliac muscle with adjacent fat stranding, warranting further evaluation by magnetic resonance imaging (MRI).

The patient was admitted and started empirically piperacillin/tazobactam. After two days, therapy was switched to ampicillin according to susceptibility results.

Later, a pelvic MRI demonstrated multiple fluid collections, predominantly within the right iliacus muscle and adjacent to the distal iliopsoas tendon (Figure 1a), with imaging characteristics indicative of abscess formation and surrounding inflammatory changes. Additional findings, including synovial enhancement, small joint effusion and minor periarticular collections, raised concern for potential septic arthritis (Figure 1c). Furthermore, bone marrow signal abnormalities with peripheral irregular enhancement in the intertrochanteric region, femoral neck, and femoral head were suspicious for osteomyelitis (Figure 1b).

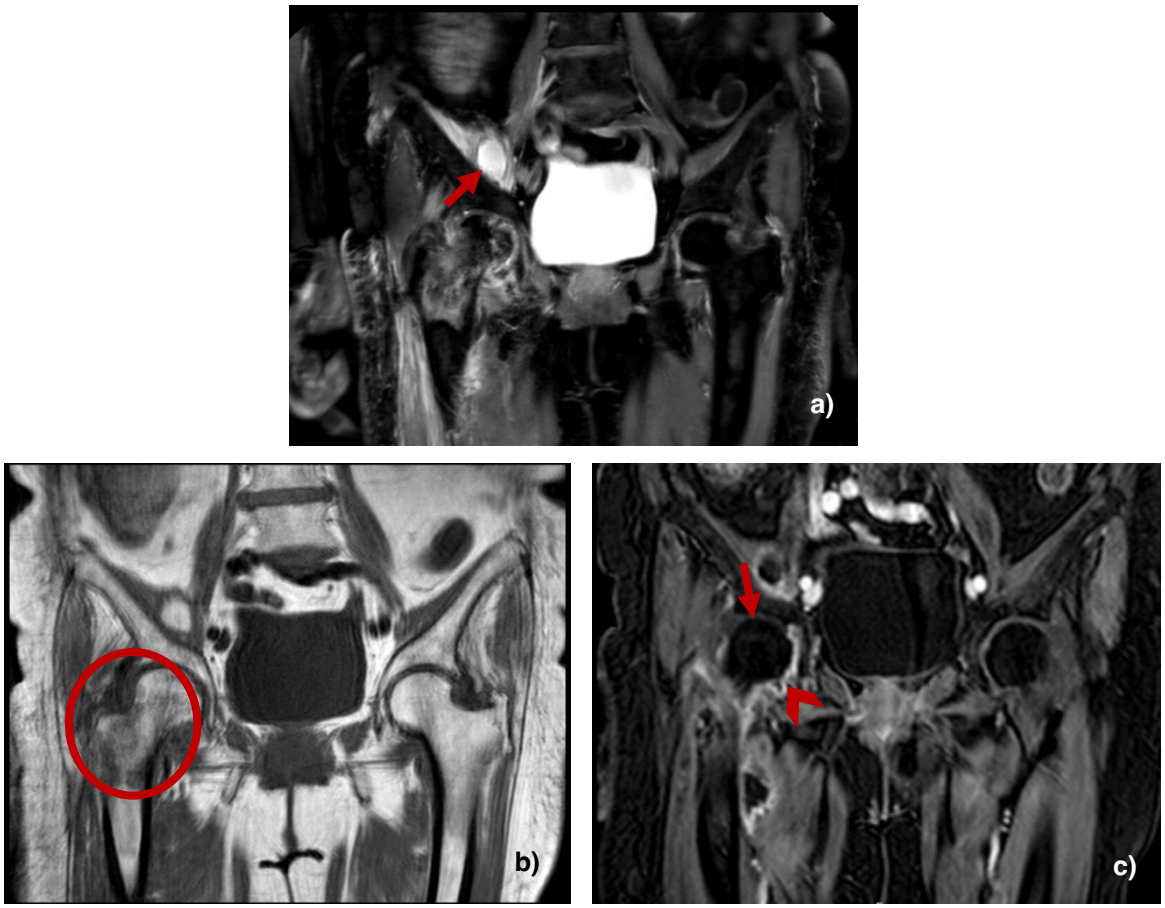

Figure 1. Pelvic MRI: a) Collection located within the right iliacus muscle, in close relation to the distal iliopsoas tendon (arrow) with marked hyperintensity on fluid-sensitive sequences, suggestive of abscess formation. b) Osteomyelitis at the right proximal femur. c) Septic arthritis of *the right hip with low signal intensity (arrow) of the right femoral head compared with the contralateral femoral head and enhancement of the synovial membrane (arrowhead) around the right* hip joint.

Based on these findings, we were facing a case of salmonellosis with abscesses of the right iliopsoas muscle and right proximal femur septic arthritis and osteomyelitis.

An orthopedic consultation was requested. To control the infectious focus and given that the patient continued to exhibit elevated inflammatory markers and persistent fever, a proximal femoral osteotomy on the right side was performed, followed by surgical joint debridement and placement of antibiotic-loaded spacers. Intraoperative access to the iliopsoas muscle was not possible. Cultures from the proximal femoral bone tissue were positive for Salmonella spp. and sensitive to ampicillin.

During hospitalization, the patient was also followed by the infectious diseases team. In an immunocompromised patient due to corticosteroid therapy, the treatment regimen requires a minimum of six weeks of antibiotic therapy.

The total duration was guided by the resolution of the abscesses and/or completion of osteomyelitis treatment. The patient completed an approximately eight-week course of targeted antibiotic therapy, resulting in both clinical and analytical improvement.

At the time of discharge, the patient was scheduled for follow-up at the orthopedic outpatient clinic. Approximately three and a half months later, the spacer was removed, and total right hip arthroplasty was performed. The patient showed a favorable clinical evolution and continued to receive orthopedic follow-up.

Outcome and Follow-up

On follow-up, the patient reported a significant improvement in her symptoms. Her repeat laboratory results also improved, with a normalization of her pro-inflammatory results. Initially, she was seen every 2 weeks in orthopedic outpatient clinics. However, as her symptoms improved, the intervals between follow-up appointments were gradually extended. The total right hip arthroplasty was successful, and during follow-up visits, the patient reported no symptoms or pain. The patient continued to be monitored by the orthopedics department.

Discussion

Salmonella spp. remains one of the most significant foodborne pathogens and a leading cause of gastroenteritis in humans and animals [2]. Human infection typically occurs along the farm-to-fork continuum and is closely associated with the consumption of animal-derived food products. Among these, poultry and poultry products are considered major sources of contamination [2].

Although salmonellosis is commonly associated with the gastrointestinal tract, it can also occur at other sites, leading to distinct clinical syndromes [3]. The extremes of age and the growing use of immunosuppressive drugs to treat autoimmune and rheumatic diseases has resulted in a rise in atypical invasive manifestations [4]. In this case, our patient was considered immunocompromised since she was on corticosteroid therapy to treat organizing pneumonia which increased her susceptibility to Salmonella infection. Glucocorticoids suppress innate and adaptive immunity by reducing TNF-α, IFN-γ, and dendritic cells [3]. They also impair intestinal barrier function, promoting bacterial adhesion and translocation to the mesenteric lymph nodes [3]. The initial clinical presentation of the patient, with inguinal pain and functional limitation of gait, without gastrointestinal symptoms or fever, made the diagnosis more challenging. Clinical suspicion was raised by the worsening of inflammatory signs and the lack of response to the initial antibiotic treatment.

Non-typhoidal Salmonella has the potential to disseminate through the bloodstream and infect nearly any anatomical location. Septic arthritis caused by Salmonella is an uncommon manifestation, with an estimated incidence of 0.27% [1]. Osteomyelitis also represents a very uncommon complication, occurring in approximately 0.8% of cases [5]. A systematic review conducted between 1970 and 2019 identified only 67 cases of osteomyelitis related to Salmonella infection, highlighting the rarity of such presentations [5].

Salmonella osteomyelitis typically involves the diaphysis of long bones, most commonly the femur and the humerus [6]. Most of the previously reported cases have affected the femur unilaterally, similar to this case. However, there are also cases described in the literature of bilateral Salmonella osteomyelitis and even cases where multiple bones are affected simultaneously [6].

Salmonella infections at different sites require prompt diagnosis, swift intervention, and appropriate treatment. Upon suspicion of septic arthritis or acute osteomyelitis, broad-spectrum intravenous antibiotics should be initiated as soon as possible. Ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole were frequently used to treat Salmonella infections, which contributed to a widespread occurrence of antimicrobial resistance. As a result, third-generation cephalosporins have become the preferred treatment option [2]. Antibiotic therapy should be adjusted according to the antibiogram results. In this case, the patient started empirically on piperacillin-tazobactam antibiotic therapy, which was later switched to ampicillin based on the antibiotic sensitivity results.

The management of Salmonella septic arthritis involves joint aspiration, targeted antibiotic therapy, and surgical drainage in cases where adequate aspiration cannot be achieved [1].

There is limited information in the literature regarding the optimal duration of the treatment. Intravenous antibiotics should be continued for at least 4 to 6 weeks [6,7], and inadequate treatment duration may lead to failure or recurrence. However, most reported cases with favorable outcomes received antibiotic therapy for 6 to 8 weeks [5].

The discontinuation of antibiotic therapy should be guided by the patient's clinical response to treatment, resolution of inflammatory markers, and radiological improvement [5]. In the absence of randomized or case–control studies establishing standardized antimicrobial regimens or surgical strategies, individualized treatment remains essential for effective patient management.

Limitations of the study

As a single-case observation, the findings cannot be generalized to broader patient populations, and causality between corticosteroid-induced immunosuppression and the development of osteoarticular complications cannot be formally established.

Conclusions and Implications

This case highlights a rare and severe presentation of non-typhoidal salmonellosis in an elderly immunocompromised patient, manifesting as iliopsoas abscess, septic arthritis, and proximal femur osteomyelitis. The atypical clinical presentation — without fever or gastrointestinal symptoms — underscores the diagnostic challenge in this population. Successful outcome relied on early microbiological diagnosis, MRI-guided imaging, targeted antibiotic therapy for approximately eight weeks, and multidisciplinary surgical management. Clinicians should maintain a high index of suspicion for osteoarticular complications in patients with *Salmonella* bacteraemia receiving immunosuppressive therapy, as prompt recognition and individualized treatment are essential to achieve favourable outcomes.

Impact

This case reinforces the importance of considering invasive osteoarticular infections in patients with non-typhoidal salmonellosis and immunosuppressive therapy, a population at increasing risk given the growing use of corticosteroids and other immunosuppressive agents. Early use of advanced imaging, prompt microbiological diagnosis, and a multidisciplinary approach are critical to achieving favourable outcomes in these complex presentations. These findings may guide clinicians in the early recognition and management of rare focal complications of salmonellosis, ultimately improving patient outcomes.

Suggestions for Future Research

Given the rarity of osteoarticular complications of non-typhoidal salmonellosis, the current evidence base relies predominantly on case reports and small case series, limiting the establishment of standardized treatment protocols. Future research should prioritize the development of prospective multicenter registries to systematically collect data on patients with invasive Salmonella infections, particularly those involving osteoarticular sites. Such registries would enable the definition of optimal antibiotic duration, the role of surgical intervention, and the impact of immunosuppressive therapy on clinical outcomes. Additionally, studies examining the microbiological and host factors that predispose immunocompromised patients to focal Salmonella infections are warranted, as these may inform risk stratification and early intervention strategies.

Declarations

1-1- Author Contributions

Conceptualization, R.D.F. and J.M.A.; methodology, R.D.F and J.M.A.; software, R.D.F.; validation, R.D.F., J.M.A., J.L.P., J.L.M. and E.N.; formal analysis, J.L.P, J.L.M. and E.N.; investigation, R.D.F.; resources, R.D.F.; data curation, R.D.F.; writing–original draft preparation, R.D.F.; writing–review and editing, J.L.M and E.N.; visualization, R.D.F., J.M.A., J.L.P., J.L.M. and E.N.; supervision, J.L.P., J.L.M. and E.N.; project administration, E.N.; All authors have read and agreed to the published version of the manuscript.

1-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to patient privacy and confidentiality restrictions.

1-3- Funding

None.

1-4- Acknowledgements

The authors have no acknowledgements to declare.

1-5- Institutional Review Board Statement

Ethical review and approval were waived for this study, as it constitutes a single case report and does not meet the threshold for formal ethics committee review under institutional guidelines.

1-6- Informed Consent Statement

Informed consent was obtained from the patient for publication of this case report and accompanying images.

1-7- Conflicts of Interest

There is no conflict of interest.

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