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(CASE REPORT)

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Unusual presentation of axillary abscess caused by *Salmonella* spp. in a middle-aged woman: A case report

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Abstract

We present a case of a 57-year-old woman with no significant medical history who presented with a painful axillary mass associated with fever. Initial treatment with antibiotics failed to yield improvement, leading to hospital admission. Subsequent investigation revealed an axillary abscess caused by *Salmonella* spp., a rare etiology for such presentation. The patient responded favorably to antibiotic therapy with ceftriaxone. This case underscores the importance of considering uncommon pathogens in the differential diagnosis of soft tissue abscesses, especially in cases refractory to standard treatment.

Keywords: Abscess; Axillary fossa; *Salmonella*; Diabetes

1. Introduction

Axillary abscesses are relatively common clinical entities, often attributed to *Staphylococcus aureus* or *Streptococcus* species. However, unusual pathogens should be considered in cases refractory to empirical therapy. *Salmonella* spp. are uncommon causes of soft tissue infections, and their presentation as an axillary abscess is exceedingly rare. We present a case of axillary abscess caused by *Salmonella* spp. in a middle-aged woman, emphasizing the importance of microbial identification and tailored antibiotic therapy [1].

2. Case presentation

A 57-year-old woman residing in Beni Mellal, with no discernible pathological history, was admitted to the thoracic surgery department with a painful axillary mass that had been developing for one month. The patient presented with a febrile context and general condition, without any other associated signs, particularly no chest pain or digestive or urinary disorders. Initially, the patient consulted a general practitioner, who prescribed antibiotic therapy. However, there was no clinical improvement. One week later, the patient presented to our hospital with an increase in pain and size of the right axillary mass, as well as fever. The initial clinical examination revealed a febrile patient with a temperature of 38.5 °C, presenting with a painful, mobile, tender, soft, and fluctuating right axillary mass measuring approximately 4 cm by 5 cm, with slight overlying erythema. The remainder of the examination was unremarkable.

Biological tests conducted during the patient's hospitalization revealed hyperleukocytosis of 20.8 G/L, with a predominance of neutrophils. The C-reactive protein (CRP) level was 20 mg/L. An ultrasound examination of the right axilla revealed the presence of a heterogeneous, non-vascularized collection, with an approximate size of 5.1 x 4.3 cm. There was no evidence of soft tissue infiltration or adenopathy(Figure1).

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Figure 1 The ultrasound image demonstrates a heterogeneous, non-vascularized collection, with an approximate size of 5.1 x 4.3 cm

An axillary abscess was diagnosed and subsequently drained. The fluid was transported to the medical microbiology laboratory in a sterile, well-sealed container. Upon macroscopic examination, the material was observed to exhibit a yellowish cream coloration and a dense consistency. Ziehl-Neelsen staining revealed the absence of acid-fast bacilli (AFB), while GeneXpert testing was negative for *Mycobacterium* tuberculosis. Gram staining of the pus demonstrated the presence of numerous predominantly neutrophilic leukocytes and Gram-negative bacilli. A 24-hour pus culture yielded smooth, non-haemolytic, cream-coloured colonies on blood agar (Figure2) and yellowish colonies on Salmonella Shigella (SS) agar that were lactose- and H2S-positive.

Figure 2 Smooth, non-haemolytic, cream-coloured colonies on blood agar

A gram of culture has been objectified Gram-negative bacilli. The colonies were identified as *Salmonella* spp. by the Phoenix BD M50 automated system (Becton, Dickinson, USA). The isolate was found to be sensitive to ampicillin,

amoxicillin-clavulanic acid, ceftazidime, ceftriaxone, imipenem, trimethoprim-sulfamethoxazole, erythromycin, azithromycin, and gentamicin. However, it was resistant to ciprofloxacin and levofloxacin.

The patient was initiated on amoxicillin-clavulanic acid, given the previous suspicion of a common soft-tissue abscess pathogen such as Staphylococcus aureus. Following the results of the microbiological examination, the patient was switched to ceftriaxone. Further laboratory tests were ordered, with the fasting blood glucose level recorded at 12.92 mmol/L and the hemoglobin A1c (HbA1c) level at 11.6%. The results of the renal function tests, blood ionograms, and liver function tests were within the normal limits. The serological tests for syphilis, hepatitis B and C, and HIV were negative. The results of the blood cultures, stool cultures, and urocultures were all negative. The patient demonstrated a favorable response to treatment, exhibiting clinical and biological improvement. The white blood cell count increased to 10.0 x 109/L, while the C-reactive protein (CRP) level was 3.53 mg/L.

3. Discussion

Despite advances in individual and community-based sanitation, salmonellosis remains an endemic problem[1]. *Salmonella* are facultative anaerobic Gram-negative bacilli belonging to the Enterobacteriaceae family. *Salmonella*-induced illnesses may be classified into two main species*; S. enterica* and *S. bongori* [2]. However, there are many subspecies of both. The reservoir of typhoid disease is humans, whereas non-typhoid *Salmonella* are widely distributed among animals. In humans, non-typhoidal Salmonella infections are most often associated with food products, while the remainder are nosocomial infections or contracted from pets[3].*Salmonella* are frequently associated with gastroenteritis, and extra-intestinal infections may occur in 5-10% of patients with salmonella bacteraemia[4].

Salmonella infection commonly manifests as gastroenteritis, with a wide spectrum of potential subacute and remote sequelae[5,6]. Individuals with compromised immune systems face an elevated risk of severe initial infection and long-term complications[7]. Moreover, populations in developing nations, where sanitation and healthcare resources are scarce, encounter challenges in accessing effective antibiotic therapy, heightening susceptibility to adverse outcomes Extraintestinal focal infections (EFI) attributed to non-typhoidal *Salmonella* (NTS) are infrequent and lack well-defined risk factors[8]. Examples of EFIs encompass diverse clinical entities such as mycotic aneurysm, pleuropulmonary invlvement, and spinal osteomyelitis [9].

The case reported here is notable for several reasons. To begin, the patient is a 57-year-old female who presented with an axillary abscess attributed to *Salmonella* spp. This unusual clinical scenario underscores the necessity for healthcare providers to broaden their diagnostic considerations beyond typical symptomatology.

The initial presentation of a painful axillary mass accompanied by fever posed significant diagnostic challenges, confounding initial treatment efforts. Empirical antibiotic therapy targeting common soft tissue pathogens failed to elicit the desired therapeutic response. This aligns with existing literature highlighting the diagnostic complexity associated with extraintestinal manifestations of Salmonella infections, which may mimic more common soft tissue infections [10,11,12].

Microbiological Findings and Treatment Adjustments: Microbiological evaluation, including Gram staining, culture, and sensitivity testing of the abscess pus, played a pivotal role in confirming the etiology as Salmonella abscess and guiding subsequent therapeutic interventions[13].This underscores the paramount importance of accurate microbiological diagnosis in facilitating targeted antimicrobial therapy, as empirical regimens may prove inadequate in the context of unusual pathogens[14].

Extra-intestinal infection by *Salmonella* occurs by dissemination of the bacteria through the bloodstream or lymphatics [15]. Haematogenous spread occurs from the gastrointestinal tract, and extra-intestinal infection ensues after distant seeding of the bacteria. *Salmonella* can also spread through the lymphatic route from the GI tract or tonsils [16].

The patient's underlying poorly controlled diabetes mellitus represents a significant predisposing factor for unusual infectious complications, including Salmonella abscesses. Emerging literature suggests that diabetes-related immunodeficiency may increase susceptibility to opportunistic pathogens, necessitating comprehensive management strategies addressing both the primary condition and associated infectious complications[17].

Following are the case reports of *Salmonella* isolated from different tissues by different authors.

Zachee et al. have reported lung abscess due to non-typhoid *Salmonella* in immunocompromised host[18]. Arya et al. have reported pancreatic abscess caused by S. typhi[19]. Raghunatha et al. have reported a case of injection abscess due

to *S. typhi*[20].Sinha et al. have reported a case of *Salmonella typhi* isolated from splenic abscess[21]. Hung et al. have reported pelvic abscess caused by *Salmonella*[22]. Barrett et al. have reported "a case of breast abscess: a rare presentation of typhoid"[23]. MK Lalita et al. in their study from 6250 cases of Salmonellosis have reported soft tissue abscess in skin (7), parotid (2), thyroid (3), breast (1), inguinal node (1), bronchial sinus (1), and injection site (1)[24]. There are innumerable reports on isolation of *Salmonella* from various sites other than the breast. Only few articles have been reviewed here.

The patient exhibited a favorable clinical response following the adjustment to targeted antibiotic therapy, accompanied by normalization of inflammatory markers. This highlights the crucial role of vigilant clinical monitoring and timely therapeutic adjustments in optimizing patient outcomes, particularly in the context of unusual infectious presentations.

While Salmonella abscesses remain rare, healthcare providers must remain vigilant to the possibility of atypical presentations, particularly in immunocompromised patients. Public health initiatives aimed at enhancing patient education on hygiene practices, food safety measures, and glycemic control in diabetic populations may serve as preventive strategies to mitigate the risk of similar infections [25].

4. Conclusion

In conclusion, the presented case underscores the intricate interplay between clinical presentation, diagnostic challenges, and therapeutic interventions in the management of uncommon infectious diseases. The middle-aged woman's journey from initial symptom onset to diagnosis and eventual recovery serves as a poignant reminder of the importance of vigilance, thorough investigation, and adaptability in the face of diagnostic uncertainty. The identification of *Salmonella* spp. as the causative agent in an axillary abscess, while rare, highlights the necessity for clinicians to maintain a broad differential diagnosis and consider unusual pathogens, particularly in cases refractory to empirical therapy. Furthermore, the successful outcome following tailored antibiotic treatment emphasizes the pivotal role of accurate microbial identification and susceptibility testing in guiding therapeutic decisions and optimizing patient care. This case not only enriches our understanding of the diverse manifestations of infectious diseases but also underscores the importance of a multidisciplinary approach, encompassing clinical expertise, microbiological insights, and patient-centered care, in achieving favorable outcomes. As we navigate the complexities of infectious diseases, this case serves as a testament to the resilience of both patients and healthcare providers in the pursuit of effective diagnosis and treatment.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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