PEDIATRIC SCIENCES JOURNAL
The Official Journal of the Pediatric Department, Faculty of Medicine, Cairo University, Egypt

Case Report

Melioidosis in an infant presenting with Eschar-like lesion: A Diagnostic Dilemma

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Received: 8/5/2025; Accepted: 7/6/2025; Published online: 30/6/2025

Abstract:
Melioidosis, caused by *Burkholderia pseudomallei*, is an uncommon but serious infection in children and is predominantly reported in endemic regions, such as Southeast Asia and northern Australia. Melioidosis is known for its varied clinical spectrum of manifestation, which can range from mild to life-threatening presentations. Although pneumonia and septicemia are the most frequent presentations, cutaneous manifestations can also occur. These skin manifestations often mimic other tropical diseases, making diagnosis challenging, especially in resource-limited settings. Here, we describe a case of an infant from Andaman and Nicobar Islands, India, who presented with fever, respiratory distress, purulent ear discharge, diarrhea and an eschar-like skin lesion resembling scrub typhus. Given the initial clinical presentation, rickettsial infections were considered; however, blood culture confirmed *Burkholderia pseudomallei* as the causative agent. The patient was successfully managed with an extended course of intravenous meropenem and oral trimethoprim- sulfamethoxazole, which led to full recovery. This case underscores the importance of recognizing melioidosis as a differential diagnosis in endemic areas, particularly in children presenting with atypical skin lesions mimicking other febrile illnesses. Enhanced clinical awareness, coupled with improved diagnostic capabilities and timely initiation of appropriate antimicrobial therapy, is crucial for the effective management of melioidosis. This is particularly vital in regions where the disease remains underreported, and its true burden may be underestimated.

Keywords: Melioidosis; *Burkholderia pseudomallei*; pediatric infections; eschar
Abbreviations: PCR**:** Polymerase Chain Reaction; TMP-SMX: trimethoprim-sulfamethoxazole

Introduction

Melioidosis is a potentially fatal infection caused by the gram-negative bacillus *Burkholderia pseudomallei*, which is found in soil and water in endemic regions. While primarily an adult disease associated with diabetes and immunosuppression, pediatric cases are increasingly reported, especially in endemic areas, such as Thailand, Australia, and India (*1*–*3*). Although melioidosis is traditionally associated with Southeast Asia and northern Australia, it is increasingly recognized as a global health concern with emerging reports from the Middle East, Africa, and the Americas particularly in individuals who have travelled to endemic areas (*4*, *5*). Most of the cases present during the rainy season (June to December) (*1*). Children often acquire infection through environmental exposure, via percutaneous inoculation, inhalation, or ingestion with a wide spectrum of clinical manifestations ranging from localized infections to severe sepsis and multi-organ involvement (*6*). Cutaneous involvement is more common in children and may present as abscesses, ulcers, or nodules (*7*). Eschar formation is an uncommon presentation in melioidosis and is characteristic of scrub typhus, a rickettsial infection caused by *Orientia tsutsugamushi* (*8*). Misdiagnosis can lead to delays in appropriate management and an increase in morbidity and mortality.

Here, we report a rare case of melioidosis in an infant from South Andaman, Andaman and Nicobar Islands, India, who presented with an eschar-like lesion, initially raising a suspicion of scrub typhus. Blood culture confirmed the presence of *B. pseudomallei*, and the patient improved following targeted antibiotic therapy.

Case Presentation

A 5-month-old female infant from the fisherman community of South Andaman, Andaman and Nicobar Islands, India, presented with fever for seven days, watery diarrhea for two days and vomiting for one day. On admission, the infant appeared drowsy and was in severe respiratory distress. Clinical examination revealed bilateral purulent ear discharge and a necrotic, eschar-like lesion on the right thigh (Figure 1), which raised clinical suspicion of scrub typhus, a common rickettsial disease in the region. The patient was started on oxygen therapy, intravenous fluids, empirical broad-spectrum intravenous ceftriaxone (50mg/kg/dose IV every 12 hours) and oral doxycycline (4.4mg/kg/day in two divided dose) for five days. Initial laboratory investigations showed anaemia (haemoglobin= 8.8 g/dL), thrombocytopenia (platelet count= 75,000/cu.mm), and elevated liver enzymes (total bilirubin= 0.9mg/dl, direct bilirubin= 0.3mg/dl, aspartate aminotransferase= 96 IU/L, alanine aminotransferase= 110 IU/L, gamma glutamyl transferase=228 IU/L, international normalized ratio (INR)= 1.3). Renal function tests were mildly deranged, with a blood urea level of 54 mg/dL and serum creatinine of 1.0 mg/dL.

Given the presence of an eschar-like lesion, scrub typhus IgM was tested but was negative. Dengue NS1 antigen, Dengue IgM, and *Leptospira* IgM, were also negative. Despite 48 hours of empirical antibiotic therapy, the patient's condition continued to worsen. Blood culture subsequently grew *Burkholderia pseudomallei*, confirming the diagnosis of melioidosis. The isolate was sensitive to meropenem, trimethoprim-sulfamethoxazole, ceftazidime, and chloramphenicol.

Following microbiological confirmation, intravenous meropenem (20mg/kg/dose IV every 8 hours) and oral trimethoprim- sulfamethoxazole (10mg/kg/day of trimethoprim in two divided doses) were promptly initiated. The patient showed marked clinical improvement, with defervescence occurring within one week of starting targeted antibiotics. Intravenous meropenem was administered for a total of 21 days, followed by oral trimethoprim-sulfamethoxazole to complete a 6-week eradication phase. At a one-month follow-up, the infant was clinically stable, asymptomatic, and showed no signs of relapse or complications. The kidney function tests returned to normal after initial fluid resuscitation. This case highlights the importance of considering melioidosis in the differential diagnosis of eschar-like lesions in endemic areas, even when initial suspicion may favour scrub typhus.

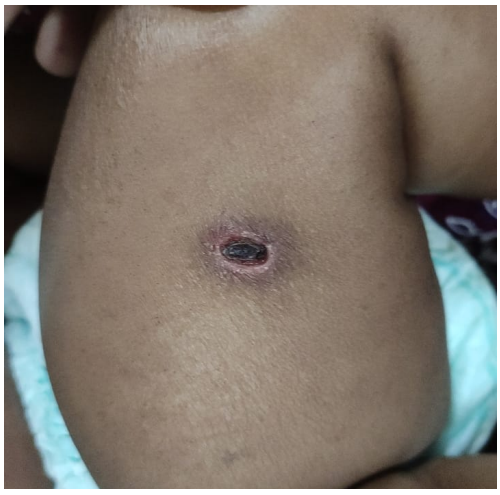

Figure 1. Eschar like lesion in the thigh

Discussion

Despite the unorthodox presentation of melioidosis, our case was diagnosed promptly. The definitive diagnosis of melioidosis in our case relied upon the isolation of *B. pseudomallei* from blood culture. In cutaneous melioidosis, culture of pus, tissue biopsy, or swab from the lesion can yield the organism. Blood cultures may be positive in disseminated cases. On culture, *B. pseudomallei* grows readily on standard media and exhibits a characteristic wrinkled, metallic colony appearance. However, in low-resource settings, misidentification is possible due to unfamiliarity with the organism and its resemblance to other non-fermenting gram-negative bacilli (*9*). Advanced methods such as PCR and serological testing may aid in diagnosis but are not always available.

Our case has recovered uneventfully owing to the timely diagnosis by the blood culture. The prognosis of pediatric melioidosis varies based on the form and severity of disease, and immunocompetence of the patient as well as timeliness of treatment. Localized cutaneous disease has a good prognosis with appropriate therapy and rarely leads to long-term complications. However, in cases of delayed diagnosis or inadequate treatment, dissemination and systemic disease can occur, leading to increased morbidity and mortality. Children with bacteremic melioidosis or multiple organ involvement have a higher risk of death (*6*). Prompt recognition, appropriate antimicrobial therapy, and follow-up are essential to ensuring favorable outcomes.

We report the atypical presentation of melioidosis in the 5-month-old infant, who presented by diarrhea and acute otitis media—both of which are uncommon manifestations in immunocompetent individuals. *Burkholderia pseudomallei* is a highly adaptable pathogen capable of involving multiple organ systems, particularly in endemic regions. Although rare, localized infections such as skin abscesses, osteomyelitis, and even otitis media have been reported, in pediatric populations (*7*). The infant in this case is from a fisherman community residing in a coastal area, where exposure to *B. pseudomallei* through contaminated water is a well-documented risk. It is plausible that the infection was acquired through contact with contaminated water during routine activities such as bathing or drinking unfiltered water. The initial symptom of diarrhoea could likely have resulted from gastrointestinal exposure to the pathogen via ingestion of contaminated water, underscoring the diverse clinical manifestations and potential transmission routes in such high-risk settings. There are no clinical features strongly suggestive of an underlying immunodeficiency. However, we are planning a careful follow-up of the patient. Should the child develop any recurrent infections or atypical clinical features suggestive of immune compromise, we intend to proceed with a thorough evaluation for immunodeficiency. The infant also had acute kidney injury probably prerenal which improved after initial fluid resuscitation. Initially, the patient was empirically treated for scrub typhus based on clinical presentation and regional prevalence. However, the lack of expected clinical response prompted further investigation. Blood culture subsequently identified *Burkholderia pseudomallei*, allowing for timely initiation of targeted antibiotic therapy. However, diagnosing melioidosis can be challenging, as blood cultures are positive in only about 60% of cases, and *Burkholderia pseudomallei* may be misidentified due to its resemblance to other non-fermenting gram-negative bacilli (*10*). This microbiological diagnosis was pivotal, as it guided appropriate management and resulted in marked clinical improvement, including defervescence and normalization of laboratory parameters.

The ability of *B. pseudomallei* to form biofilms and resist oxidative stress leads to persistent infections and relapses (*11*, *12*); therefore, prolonged antibiotic therapy is required to prevent recurrence. Treatment of melioidosis involves a two-phase approach: an intensive phase (10–14 days) with intravenous antibiotics (ceftazidime or meropenem) followed by prolonged eradication phase (3– 6 months) with oral trimethoprim-sulfamethoxazole (TMP-SMX) ± doxycycline (*13*, *14*). TMP-SMX is the preferred oral agent due to its intracellular penetration and activity against *B. pseudomallei*, but in children with sulfa allergy or intolerance, amoxicillin-clavulanate may be used as an alternative, although it is considered less effective. Patients receiving appropriate therapy have a 90% survival rate, but relapses occur in 5–9% of cases due to poor adherence to the eradication phase (*15*, *16*). Supportive care including fluid resuscitation, ventilatory support, and surgical drainage of abscesses is essential in severe cases.

Melioidosis, is a potentially severe infectious disease endemic to Southeast Asia and northern Australia. The bacterium is commonly found in soil and water, particularly during rainy seasons, and infections typically occur through percutaneous inoculation, inhalation, or ingestion (6,9). The bacteria employ virulence mechanisms such as the Type III secretion system (T3SS) to escape phagocytic killing, subvert immune responses, and facilitate intracellular survival, replication, and dissemination throughout the body. The most virulent toxins produced by the *B. pseudomallei* are cytolethal exotoxin (CLT), Burkholderia lethal factor 1 (BLF1) and HicA toxin (*17*). While melioidosis is more frequently described in adults, particularly those with underlying risk factors such as diabetes mellitus or chronic kidney disease, pediatric cases also occur and pose a diagnostic and therapeutic challenge, especially in endemic areas. In our case, direct environmental exposure may be limited; however, indirect contact via caregivers, contaminated household water, or exposure to infected soil carried indoors by adults in the fishing community could be probable routes. The geographical setting in tropical coastal area predispose to environmental exposure, especially during the rainy season. Additionally, immature immune defenses in infants likely facilitated progression from localized to disseminated disease.

Given the environmental reservoir of *B. pseudomallei* and the lack of vaccine against it, eradication is not feasible, and prevention strategies should focus on minimizing exposure, particularly in children. Public health education regarding the risks of contact with contaminated soil and stagnant water, especially in endemic regions, is important. Children should be encouraged to wear protective footwear and avoid playing in muddy or wet environments during the rainy season. In areas with known melioidosis burden, clinicians should maintain a high index of suspicion for the disease in children presenting with chronic or atypical skin lesions.

Furthermore, improved access to diagnostic microbiology services, clinician awareness, and standardized treatment protocols are needed to reduce morbidity and mortality associated with pediatric melioidosis. There is also a need for research into pediatric-specific manifestations, long-term outcomes, and potential vaccine development, which remains a distant but critical goal in endemic settings.

Conclusion

Melioidosis in children, though less commonly recognized than in adults, is a significant infectious disease in endemic regions. Cutaneous melioidosis is a relatively rare presentation but can serve as an important diagnostic clue when recognized. The clinical overlap with other conditions, particularly scrub typhus, can mislead clinicians, especially when eschar-like lesions are present. Accurate microbiological diagnosis relies on isolation of *Burkholderia pseudomallei*. Prompt accurate diagnosis and adherence to the recommended treatment regimen are vital for favorable outcomes. Pediatricians and healthcare providers working in endemic areas should be aware of the diverse manifestations of melioidosis, including its cutaneous forms, to ensure timely and effective management.

Author Contributions: All authors searched medical literature, databases, conceptualized, conducted the case review and reviewed the final manuscript. All authors have read and agreed to the published version of the manuscript.

FUNDING

Authors declare there was no extramural funding provided for this study.

CONFLICT OF INTEREST

The authors declare no conflict of interest in connection with the reported study. Authors declare veracity of information.

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