Burkholderia pseudomallei osteomyelitis: An unusual cause of fever in a returned traveller

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CASE REPORT

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Abstract

A 52-year-old diabetic man presented to the Emergency Department with a history of fevers and pain in his right thigh. He had recently returned from a 10-month trip to Vietnam. A suspected bacterial abscess in the right thigh did not respond to empirical antibiotics. Subsequent investigations revealed melioidotic osteomyelitis of the femur. This case emphasises the need to consider the diagnosis of melioidosis in patients presenting with fever following travel in endemic areas.

Key Words
Fever in returned traveller, melioidosis, osteomyelitis

Background

Melioidosis is a disease endemic in Southeast Asia and northern Australia.[1] It is caused by *Burkholderia pseudomallei*, an environmental saprophyte.[2] Infection is thought to arise by direct inoculation with contaminated water or soil, and diabetes is a strong risk factor for infection.[2,3] Most people who are infected remain asymptomatic and infection can remain latent for years. Melioidosis is rarely seen as an imported infection in Australia. We describe the diagnostic challenge of an unusual case of melioidotic osteomyelitis presenting as fever in a returned traveller.

Case details

A 52-year-old Vietnamese man presented to the Emergency Department with a five-day history of intermittent fevers, rigors, headache and myalgia. He complained of a dull ache in the right thigh but no other localising symptoms. The patient had returned to Australia after a 10-month trip to metropolitan Vietnam. He had been hospitalised twice while in Vietnam with similar presentations but could not recall any specific diagnoses or treatment. He was not provided with any documentation pertaining to his admissions. No travel vaccinations were taken prior to the trip. There were no infectious contacts or sexual activity whilst abroad. He had stable type 2 diabetes mellitus and treated hypercholesterolemia and there was a past history of hepatitis B and traumatic injury to the left knee both without sequelae.

At presentation he had a fever of 38.6°C. Examination of the cardiovascular, respiratory and gastrointestinal systems was unremarkable. He had dark tender indurated plaques on his right lateral thigh. There was a hypertrophic scar overlying the left anterior knee from a previous motorcycle accident. A full blood count and serum biochemistry were within normal limits. The C-reactive protein was 50mg/L. Repeated blood and urine cultures were negative. A malaria screen, serum electrophoresis, flavivirus and hydatid serology were all negative. The chest X-ray was normal. Empirical treatment for a suspected thigh abscess was commenced with flucloxacillin, ceftriaxone and vancomycin.

An ultrasound of his right thigh showed multiple cystic areas in the subcutaneous tissue layer. Punch biopsies of the plaques on his thigh showed dermal mucin and a lympho-histiocytic response but no causative organism was found

on Gram stain and culture. A plain X-ray of the right femur revealed a lytic lesion within the medulla (Figure 1a). This correlated with non-specific focal uptake on bone scan and a multiloculated lytic lesion on computed tomography (CT) scan of the right femur, suggestive of either osteomyelitis or malignancy (Figure 1b & 1c).

A CT of the chest, abdomen and pelvis was performed in search of either a primary source or other foci. CT findings revealed mild right upper lobe fibrosis of unknown significance and multiple round splenic hypodense lesions consistent with pyogenic abscesses (Figure 1d & 1e). Tuberculosis was strongly suspected and the patient underwent bronchoscopy. Bronchoalveolar lavage specimens were Ziehl-Neelsen stain negative and negative for growth on standard bacterial and mycobacterial culture. A Quantiferon Gold assay was also negative.

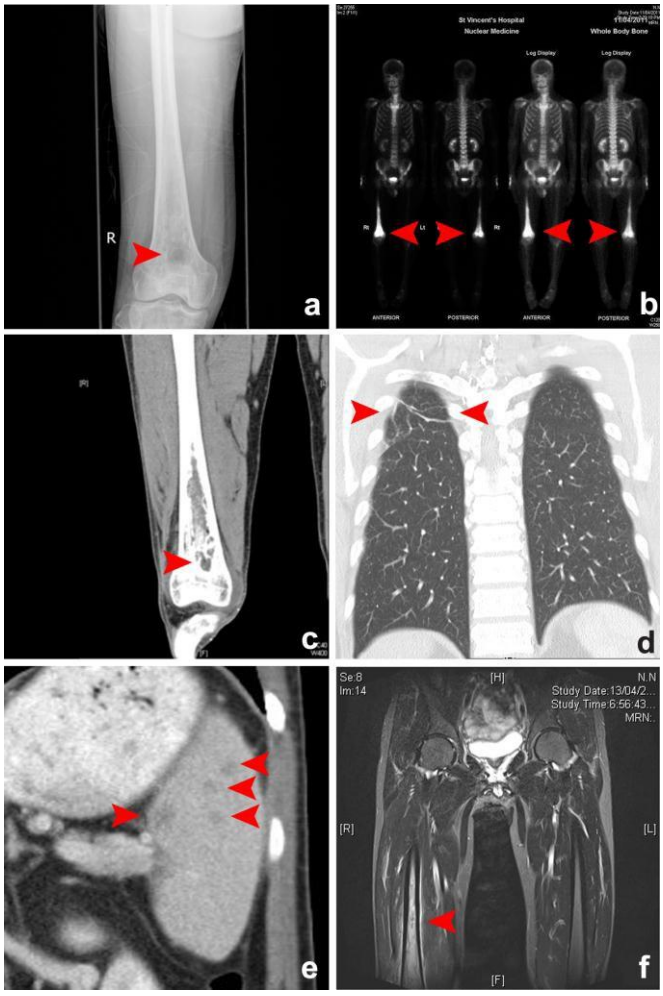

Figure 1: (a) Plain X-ray right femur showing a lytic lesion within the medulla. (b) Bone scan showing non-specific focal uptake within the right femur. (c) Computed tomography (CT) right femur showing a multiloculated lytic lesion within the medulla. (d) CT chest showing right upper lobe fibrosis. (e) CT abdomen showing multiple splenic hypodensities suggestive of pyogenic abscesses. (f) Magnetic resonance imaging (MRI) right femur showing extensive necrotic areas secondary to osteomyelitis involving the femoral shaft.

Despite broad spectrum antibiotic treatment the patient continued to be febrile with increasing right thigh pain. Magnetic resonance imaging (MRI) of the right femur was performed showing extensive necrotic areas in the distal shaft of the femur, with images diagnostic of osteomyelitis of the right femoral shaft (Figure 1f).

An orthopaedic referral was made and the patient proceeded to osteotomy with reaming and washout. Intra-operatively an extensive amount of purulent and necrotic tissue was removed from the intramedullary canal. Microscopy showed a Gram-negative bacillus and *Burkholderia pseudomallei* was isolated from intra-operative tissue and bone cultures.

The patient was commenced on a 10-week course of intravenous meropenem with concurrent high-dose oral co-trimoxazole and folate supplementation. Thereafter, he made a rapid recovery with pain and fevers subsiding as the C-reactive protein level normalised. Given the severity of his disease he was discharged on a prolonged 12-month course of oral co-trimoxazole with monthly follow-up to track clinical progress, bone recovery and the splenic abscesses.

Discussion

Melioidosis is a tropical disease, with the highest incidence occurring in Thailand and northern Australia.[4] It is also endemic in Vietnam, Laos, Malaysia, Indonesia and Singapore.

As melioidosis can affect virtually any organ, clinical manifestations are protean and may mimic other infectious diseases. Osteomyelitis is a relatively uncommon presentation of melioidosis, occurring in about 4% of cases.[3,5] Melioidosis most commonly presents with pneumonia, but in this case the patient had no respiratory symptoms and bronchoalveolar lavage was negative for *Burkholderia*. Melioidosis is also known to cause internal organ abscesses, including splenic abscesses as seen here.

The mainstay of diagnosis remains Gram stain and culture.[6] The indirect haemagglutination assay (IHA) is also widely used however it may be of limited clinical utility in areas of high background seropositivity. Sensitive nucleic acid tests are in development.

Initial treatment of melioidosis is with intensive intravenous antibiotics, either ceftazidime, imipenem or, as used in this case, meropenem.[7] Eradication therapy requires prolonged oral antibiotics to prevent disease recurrence. Current trials are evaluating the use of co-trimoxazole alone or its

combination with other oral agents.[6] Surgical drainage of large abscesses is also an important part of management.[2]

We have described a rare case of melioidotic osteomyelitis of the femur presenting as fever in a returned traveller. Clinicians should maintain a high index of suspicion in patients who have lived in, or are travelling from, endemic regions. The prognosis for localised disease is favourable but mortality is high if septicaemia develops, thus early identification and institution of appropriate antibiotic treatment is essential.[2,3,7] Adult patients require long-term follow-up due to the risk of relapse.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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PATIENT CONSENT

The authors declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient in this report.
2. All possible steps have been taken to safeguard the identity of the patient.
3. This submission is compliant with the requirements of local research ethics committees.