Case Report

Melioidosis as a cause of femoral osteomyelitis and multifocal intramuscular abscess around the hip joint in a farmer: a case report

KMD J Rodrigo[1], R Premaratna[1], HJ de Silva[1], E Corea[2]

Sri Lankan Journal of Infectious Diseases 2013 Vol.3(1);50-54

DOI: http://dx.doi.org/10.4038/sljid.v3i1.4655

Key words: *Burkholderia pseudomallei,* melioidosis, osteomyelitis

Abstract

Melioidosis is a potentially fatal infectious disease caused by the soil transmitted saprophyte *Burkholderia pseudomallei.* Though Sri Lanka is considered a non-endemic country, with the increasing number of cases reported recently there is mounting evidence that the disease is emerging here. Osteomyelitis caused by *B pseudomallei* infection is uncommon and only few cases were found in the literature. We report a case of proximal femoral osteomyelitis and multifocal intramuscular abscess around the hip joint caused by *B pseudomallei* in a Sri Lankan male farmer with diabetes who presented to our facility. This case alerts clinicians regarding the unusual aetiology of osteomyelitis probably caused by *B pseudomallei,* especially in patients with diabetes mellitus and those who have prolonged contact with soil. In such situations early institution of appropriate antibiotics will be life saving and prolonged maintenance therapy with oral antibiotics is essential to prevent recrudescence of the infection.

Introduction

Melioidosis is considered endemic in Southeast Asia and Australia. Natural aquatic environment and agricultural lands in the tropics are considered the primary reservoir of the organism. Melioidosis was first reported in Sri Lanka in the 1920s.[1] Since then, only a few sporadic cases had been reported here including one fatal case of septicaemia in 2006.[2] However the entity may be grossly underreported in Sri Lanka due to lack of clinical awareness and lack of availability of confirmatory tests. With the increasing number of cases reported recently there is mounting evidence that the disease is emerging here.[3,4]

The organism is widely disseminated in soil and human infection occurs through inhalation, ingestion or direct inoculation on damaged skin. Diabetes, thalassemia and chronic renal disease are common predisposing conditions for melioidosis. It presents with a febrile illness, ranging

[1] *University Medical Unit, Colombo North Teaching Hospital, Ragama. Sri Lanka*
[2]*Department of Microbiology, Faculty of Medicine, University of Colombo, Sri Lanka*

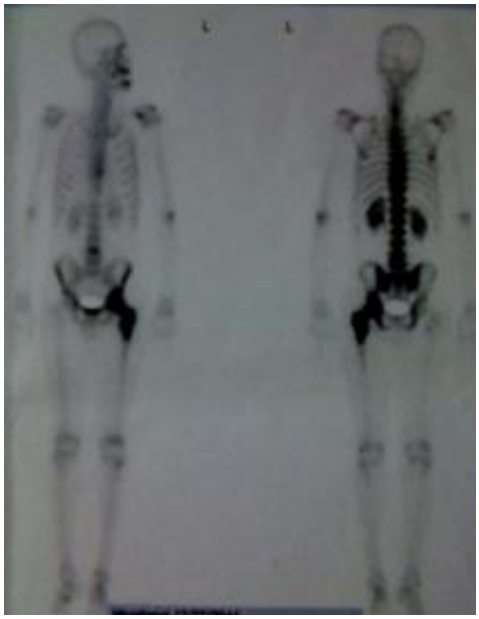
Address for correspondence: Dr. K M D J Rodrigo, University medical unit, Colombo North Teaching Hospital, Ragama. Sri Lanka E-mail- damith_rodrigo@yahoo.com Tel: +94714492876

from septicaemia to localized abscess formation. The lung is the most commonly affected organ and abscesses in the liver and spleen are also seen. Osteomyelitis caused by *B pseudomallei* infection is uncommon with few reported cases.[5,6,7,8] We report a case of proximal femoral osteomyelitis and multifocal intramuscular abscesses around the hip joint most probably caused by *B pseudomallei* in a Sri Lankan farmer.

Case presentation

Figure 1

Whole body anterior and posterior delayed images of a Tc-99m MDP bone scan



A 57 year old male farmer was admitted with intermittent high grade fever and left hip pain for 3 weeks. He had loss of appetite and loss of weight. Examination revealed mild pallor and tender left hip joint with reduced movements. The rest of the clinical examination was unremarkable. On admission his haemoglobin was 10.9 g/dl which dropped to 5.1 g/dl requiring blood transfusion. Blood picture revealed anaemia of chronic disease. ESR was 137 mm in 1st hour and C - reactive protein was 192 mg/dl (normal <0.8mg/dl). He was found to be a diabetic with FBS of 158mg/dl. Ultrasound scan of the left hip joint revealed a joint effusion of 1 cm. Blood and urine cultures revealed no growth. Renal function tests were within normal limits. AST was 125 u/l and ALT was 92 u/l. Alkaline phosphatase (ALP) was 1637 u/l. Hip joint aspiration was negative for acid fast bacilli and TB-PCR and its culture didn't yield a growth . He didn't respond to initial empirical treatment with intravenous ceftazidime1g three times a day and intravenous cloxacillin 500 mg three times a day for 14 days.

Whole body anterior and posterior delayed images of a Tc-99m MDP bone scan demonstrated intense tracer uptake in the left proximal femur. (Figure1). The X ray pelvis also showed evidence of osteomyelitis which was confirmed by the CT pelvis. It revealed left side multi focal intramuscular abscess around the hip joint and proximal femur osteomyelitis (Figure 2). CT guided aspiration of the intramuscular abscess fluid revealed a leucocyte count of 55x103/µL with 95% polymorphs and yielded a growth of Gram negative bacilli, identified as pseudomonas spp which was sensitive to ceftazidime, cotrimoxazole, imipenem, meropenem and levofloxacin. Bacterial identification using API 20NE failed to identify the organism. The repeat culture didn't yield a growth probably because the patient had been on intravenous ceftazidime. Blood for antibodies against *B pseudomallei* which was sent around 2 weeks after admission was positive at 1:80(IHA). The repeat titre after 4 weeks increased to 1:320 which demonstrated a 4 fold rise in titre.

He was diagnosed as having probable melioidosis with multifocal intramuscular abscess around the left hip joint and left proximal femoral osteomyelitis.

Figure 2(a)
Multiloculated intramuscular abscess around the left hip joint (white arrow)

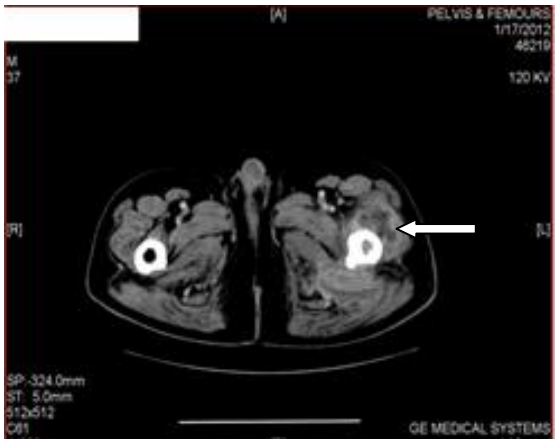
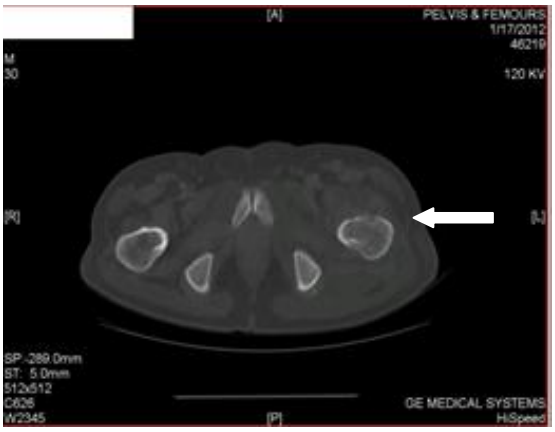


Figure 2(b).
Bone window of the CT pelvis showing left proximal femoral osteomyelitis (White arrow)



He was discharged on maintenance regime of oral cotrimoxazole 1920 mg twice a day and oral doxycycline 100 mg twice a day for 20 weeks. Our patient remained asymptomatic after 6 months of follow up and a subsequent ultrasound and CT images showed full resolution of the osteomyelitis and failed to demonstrate any abscess formation.

Discussion

Osteomyelitis is an uncommon presentation of melioidosis and only few cases were found in the literature [5,6,7,8]. In the 10-year prospective study on endemic melioidosis in northern Australia by Currie et al, among 252 cases only 4 % presented with osteomyelitis or septic arthritis.[9] The infection has the potential for a prolonged latent period with reactivation into acute and fulminating infection. The reactivation of the latent disease is often associated with concurrent diseases. Our patient had diabetes which probably resulted in immune suppression leading to activation of latent *B pseudomallei* infection, acquired previously. He had no history of travel to a known endemic country.

Ceftazidime was regarded as the drug of choice in acute melioidosis since the late 1980s. However there is recent evidence that carbapenems have better efficacy against *B pseudomallei* when comparing mortality among patients with severe melioidosis.[10,11] Treatment of localized osteomyelitis due to *B pseudomallei* remains problematic because no clinical trials have been reported. Carbapenems are the most active antibiotics against *B pseudomallei*, with a minimal inhibitory concentration of 0.5 µg/mL that inhibits 90% of strains tested (MIC_{90}). They also demonstrate a post antibiotic effect against *B. pseudomallei* which is not shown by ceftazidime .[12]

Furthermore carbapenems have a higher ability to penetrate bone compared with ceftazidime.[13] However, the organism has the ability to survive within phagocytic cells. Since β-lactams do not penetrate intracellular sites and kill non multiplying bacteria, therapy with carbepenems may also fail to prevent relapse of melioidosis. Therefore carbapenems must be combined with an antibiotic capable of penetrating phagocytic cells. Both tetracyclines and fluoroquinolones can penetrate phagocytic cells and are capable of penetrating into bone, and may be effective against *B pseudomallei*. Cotrimoxazole with doxycycline is a suitable combination therapy for eradication.[14] We instituted doxycycline and cotrimoxazole in the eradication regime.

This case alerts clinicians regarding the unusual aetiology of osteomyelitis caused by *Burkholderia pseudomallei*, especially in patients with diabetes and those who have prolonged contact with soil. In such situations, early institution of appropriate antibiotics will be life saving. A prolonged maintenance therapy with oral antibiotics is essential to prevent recrudescence of the infection.

References

1. Denny CR. Melioidosis in a European. Ceylon Journal of Science 1927; **2**: 37-40. *No doi*
2. Jayasekara K, Perera S, Wijesundere A. Fatal *Burkholderia pseudomallei* septicaemia. *Ceylon Medical Journal* 2006; **51**:69-70. *No doi*
3. Corea E, Thevanesam V, Perera S, Jayasinghe I, Ekanayake A, Masakorala J, Inglis TJJ. Melioidosis in Sri Lanka: an emerging infection. *Sri Lankan Journal of Infectious Diseases* 2012; **2**(1):2-8 *doi: http://dx.doi.org/10.4038/sljid.v2i1.3801*
4. Perera GND, Dias LD, Kulatunga A, Corea E, Masakorala J.A. Case report of melioidosis. *Sri Lankan Journal of Infectious Diseases* 2012; **2**(1):47-51 *doi: http://dx.doi.org/10.4038/sljid.v2i1.3795*
5. Kosuwon W, Saengnipanthkul S, Mahaisavariya B, Laupattarakasem W. Musculoskelatel Melioidosis. *J Bone Joint SurgAm*. 1993; **75**(12):1811-5. *No doi*
6. Yazdanpanah Y, Lemaire X, Senneville E, et al. Melioidotic osteomyelitis of the femur occurring in a traveller. *Journal of Travel Medicine* 2002; **9**:53-54. *http://dx.doi.org/10.2310/7060.2002.23954*
7. Subhadrabandhu T, Prichasuk S, Sathapatayavongs B. Localised melioidotic ostromyelitis. *Journal of Bone Joint Surgery* 1995; **77-B**:445-449. *No doi*
8. Popoff I, Nagamori J, Currie B. Melioidotic osteomyelitis in northern Australia. *Aust N Z J Surg* 1997; **67**:692-695. *http://dx.doi.org/10.1111/j.1445-2197.1997.tb07111.x*
9. Currie BJ, Fisher DA, Howard DM, et al. Endemic Melioidosis in tropical northern Australia- a 10 yr prospective study and review of the literature. *Clin Infect Dis.* 2000; **31**:981-986. *http://dx.doi.org/10.1086/318116*
10. Simpson AJH, Suputtamongkol Y, Smith MD, et al. Comparison of Imipenem and ceftazidime as therapy for severe Melioidosis. *Clin Infect Dis* 1999; **29**:381-387. *http://dx.doi.org/10.1086/520219*
11. Cheng AC, Fisher DA, Anstey NM, Stephens DP, Jacups SP, Currie BJ. Outcomes of patients with melioidosis treated with meropenem. *Antimicrob Agents Chemother* 2004; **48**:1763–5 *http://dx.doi.org/10.1128/AAC.48.5.1763-1765.2004*

12. Walsh AL, Smith MD, Wuthiekanun V, White NJ. Post antibiotic effects and *Burkholderia pseudomallei*: evaluation of current treatment. *Antimicrob Agent Chemother* 1995; **39**:2356-2358. *http://dx.doi.org/10.1128/AAC.39.10.2356*

13. Macgregor RR, Gibson GA, Bland JA, Imipenem pharmacokinetics and body fluid concentrations in patients receiving high dose treatment for serious infections.*Animicrobe Agents Chemother* 1986; **29**:188-192. *http://dx.doi.org/10.1128/AAC.29.2.188*

14. Chaowagul, W. Chierakul, W. Simpson, et al. Open-label randomized trial of oral trimethoprim-sulfamethoxazole, doxycycline, and chloramphenicol compared with trimethoprim sulfamethoxazole and doxycycline for maintenance therapy of melioidosis. Antimicrob. Agents Chemother. 2005; **49**(10), 4020-4025. *doi: 10.1128/AAC.49.10.4020-4025.2005*