Case report

A Case Report of Melioidosis

G N D Perera,[1] L D Dias,[1] A Kulatunga,[1] E Corea,[2] J Masakorala[2]

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Abstract

Melioidosis is an emerging infection in Sri Lanka. Since the clinical presentation of melioidosis is not distinctive, a high index of clinical suspicion is required. Definitive diagnosis is usually made by isolation of the causative bacterium, *Burkholderia pseudomallei*, in culture. Although it is not a difficult bacterium to culture, initial identification of the isolate requires prior experience with *B. pseudomallei*. A case report of a patient with acute onset of lung abscess with a positive sputum culture for *B. pseudomallei* is presented.

Introduction

Melioidosis is caused by the saprophytic soil bacterium *Burkholderia pseudomallei*. The clinical presentation is varied and the infection may be acute or chronic, localized or disseminated.[1] Severe infection is an opportunistic disease and more common in persons with diabetes mellitus, renal disease, liver disease or alcoholism. Infection is acquired by inoculation or inhalation of soil and water and occupational exposure to surface water and mud is a risk factor.[2]

Since the first case of melioidosis was reported in a European tea broker in 1927 [3], case reports of melioidosis have been published sporadically from Sri Lanka including a report of brain and lung abscess in a traveler returning to Holland in 1994[4] and a case of fatal septicaemia in 2005.[5] The latter was the first laboratory confirmed infection of melioidosis in Sri Lanka although

[1] *National Hospital of Sri Lanka*
[2] *Department of Microbiology, Faculty of Medicine, University of Colombo*

Address for correspondence: Dr E M Corea. Senior Lecturer, Department of Microbiology, Faculty of Medicine, University of Colombo. Tel: 077808439. E-mail: enokacorea@hotmail.com

suspected clinical cases and laboratory isolates have been reported previously and since (personal communication).

Case Report

A 62 year old, previously healthy engineer, from Kosgama, working in the Southern railway development project was admitted with a history of fever for 10 days, pleuritic type chest pain, and shortness of breath. He had purulent sputum associated with haemoptysis and was treated in the local hospital for lung abscess without success, despite administration of intravenous broad spectrum antibiotics. He presented to us with worsening symptoms. He was a non-smoker and had underlying diabetes mellitus with good glycaemic control.

Examination revealed an ill looking, febrile patient. Respiratory system examination revealed bilateral coarse crepitations and an area of bronchial breathing. There were no pleural effusions, cardiac murmurs or organomegaly. Chest x-ray (Figure 1) showed large abscesses in both lung fields.

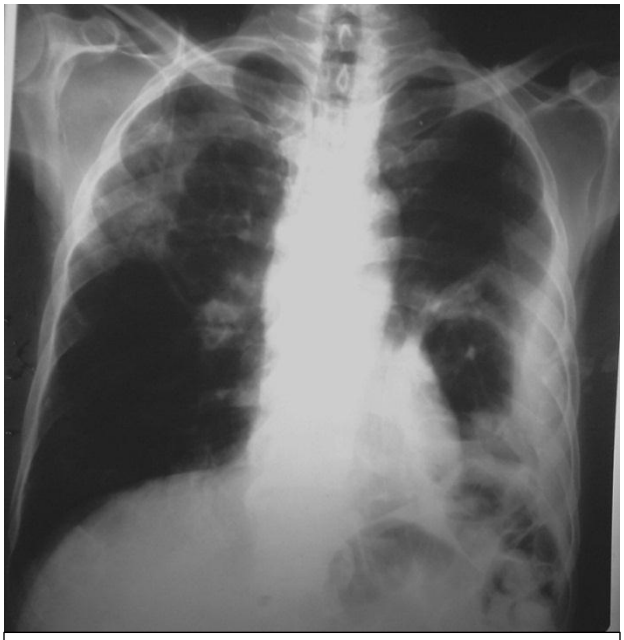

Figure 1 Chest X-ray showing multiple abscesses

He had a raised ESR of 91mm/hr and a C-reactive protein of 60.2mg/l. Full blood count showed a neutrophil leucocytosis (WBC $18x10^3$/l, neutrophils 82%). Sputum culture grew a bacterium, initially identified as a *Pseudomonas* species. We treated him with intravenous meropenem according to the antibiotic sensitivity pattern. Symptoms persisted, and fever continued despite antibiotics and chest physiotherapy. Sputum for acid fast bacilli and the Mantoux test were negative. Right sided infective endocarditis was excluded by an echocardiogram.The patient deteriorated and continued to have elevated inflammatory markers. His clinical picture at this stage was suggestive of an underlying atypical infection. Retroviral screening, antinuclear antibody (ANA) and antinuclear cytoplasmic antibodies (ANCA) were negative.

We considered the rare organisms responsible for severe cavitatory pulmonary lesions. The most likely differential diagnosis was infection with *B. pseudomallei*, which resembles pseudomonas in culture. Sputum and blood cultures were repeated. Culture of sputum isolated a Gram negative bacillus that was oxidase positive. A distinctive 'earthy' odour emanated from the culture, resembling the smell of soil after rain.

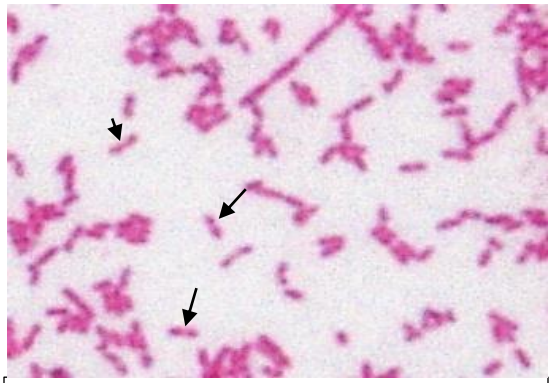

Figure 2 Gram stain showing safety pin appearance

The Gram stain (Figure 2) showed the typical safety pin appearance (densely staining end and a pale middle).

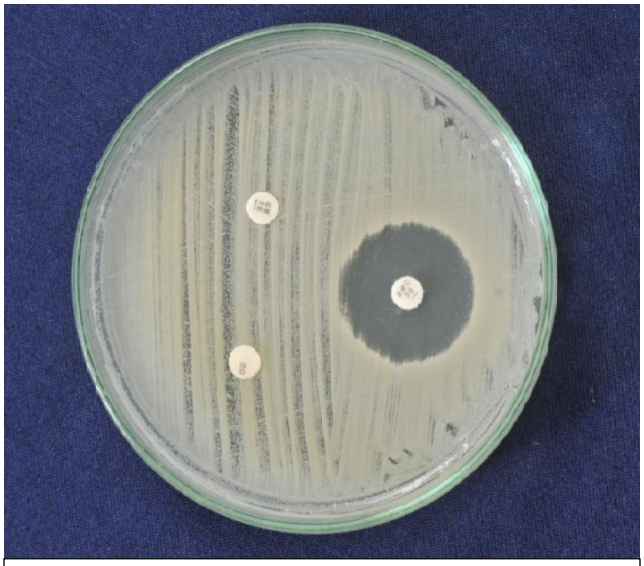

Figure 3 Antibiotic sensitivity pattern

Antibiotic sensitivity testing, using the Clinical and Laboratory Standards Institute (CLSI) disk susceptibility testing method, showed gentamicin and polymyxin resistance and sensitivity to co-amoxyclav (Figure 3).

On day five of incubation the culture developed the characteristic wrinkled colonial morphology (Figure 4) and was tentatively confirmed to be *B. pseudomallei.*

We performed a contrast CT thorax and bronchoscopy. Both investigations ruled out the possibility of an underlying bronchial malignancy. Blood cultures were persistently sterile. Imaging studies of the abdomen did not reveal any extrapulmonary foci of infection with normal liver and renal profiles.

Further identification of the isolate was not possible in the laboratory and the isolate was sent for confirmation of identity by PCR and gene sequencing to the collaborating laboratory (PathWest Laboratory Medicine, Western Australia). The indirect haemagglutination (IHA) test to detect antibodies to *B. pseudomallei* (set up as part of a research study) was negative. However, this test is used to detect chronic infection and environmental exposure and is not recommended as a diagnostic test in acute melioidosis. With preliminary identification of the isolate as *Burkholderia pseudomallei*, a diagnosis of severe pulmonary melioidosis was made.

We started the patient on intravenous ceftazidime and oral cotrimoxazole as recommended[6] and continued IV ceftazidime for 6 weeks. Bronchoscopy revealed extensive mucosal ulceration with mucosal plugs. Mucosal plaques sent for bacterial culture failed to isolate any organism. During the next few weeks the patient's condition improved and the inflammatory markers normalized. However, repeat X rays and CT thorax

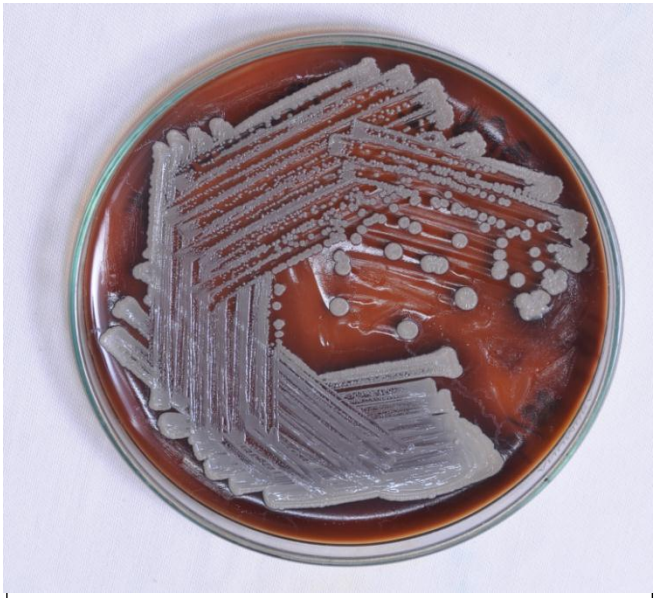

Figure 4 Colony appearance of *B. pseudomallei*

demonstrated large residual cavities in the lungs with extensive fibrosis.

After 6 weeks, intravenous antibiotics were stopped and the patient was continued on oral cotrimoxazole as maintenance therapy to prevent relapse. He continued to deteriorate despite antibiotic therapy and supportive care. There were progressive pulmonary lesions and he had severe constitutional symptoms and hypoproteinaemia. He deteriorated rapidly despite optimal medical management and supportive care and finally succumbed to the illness 3 months after the diagnosis.

We are awaiting final confirmation of the identity of the isolate by the collaborating laboratory.

Discussion

Melioidosis is an emerging infection in Sri Lanka with an increasing number of cases being reported. While only three cases of melioidosis acquired in Sri Lanka have been published,[3,4,5] the number of known cases exceeds twenty (personal communication). Since the clinical presentation of melioidosis is not distinctive, and may range from acute septicaemia to a chronic suppurative disease, a high index of clinical suspicion is required. In our patient, suspicion of melioidosis was aroused due to the clinical presentation of a non-resolving lung abscess. In addition, our patient had several risk factors for melioidosis. He was a diabetic and gave a history of multiple occupational exposures to surface water, mud and soil as he was engaged in road construction and farming.

Definitive diagnosis of melioidosis is usually made, as in our patient, by isolation of the causative bacterium, *B. pseudomallei*, in culture.[7] Although it is not a difficult bacterium to culture, a lack of familiarity with the cultural characteristics of the pathogen can lead to delays in diagnosis and treatment. Initial identification of the isolate requires prior experience with *B. pseudomallei* and many isolates are missed or misidentified, as happened in this case[8].

Although some of the preliminary screening tests, such as the Gram stain and the oxidase test, are routinely performed in microbiology laboratories, further identification of oxidase positive Gram negative bacilli is usually not possible due to the non- availability of identification panels such as the API 20NE Bacterial Identification Test Strip. Unless laboratory personnel are familiar with the colony morphology of the bacterium, they will not proceed to screen for *B. pseudomallei* by testing for resistance to gentamicin and polymyxin/colistin. In most instances, as in the initial culture from our patient, the isolate would be reported as a 'Pseudomonas species', a blanket term used to describe a vast range of species belonging to many genera such as Pseudomonas, Burkholderia, Comamonas, Stenotrophomonas etc that share the common property of being aerobic, non-fermentative Gram negative bacilli.

Recommendations

Improving the diagnosis, treatment and prognosis of melioidosis in Sri Lanka will require raising the awareness of clinicians about this disease, training of microbiologists and

laboratory technologists to identify suspect colonies in culture and perform preliminary screening tests and the establishment of a reference laboratory for rapid confirmation of bacterial identity by PCR.

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