



## Case Report

# Pleuro pulmonary melioidosis: A case series

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### Abstract

Melioidosis which is known to be endemic in South-east Asia and Northern Australia is a treatable infection and is more common than currently appreciated. It is now expanding rapidly to other regions of the world predominantly in the Indian subcontinent. The key for successful management of this disease lies in facilitating rapid and accurate diagnosis by expert personnel and timely selection of adequate sensitive antibiotics. We present here a series of three cases of melioidosis involving lung and pleura along with clinico radiological and treatment details.

**Key words:** Burkholderia pseudomallei, Co-trimoxazole, Melioidosis, Whitmore's disease

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**M**elioidosis is a bacterial infection caused by gram negative aerobic bacillus *Burkholderia pseudomallei*, which is considered as a potential agent for bioterrorism<sup>1</sup>. First described in humans by Whitmore and Krishnaswamy in 1912, this disease is also known as whitmore's disease. Melioidosis which is known to be endemic in Southeast Asia and northern Australia is now expanding rapidly to other regions of the world predominantly in the Indian subcontinent. The disease also referred as a "great mimicker" has a wide range of clinical manifestations ranging from asymptomatic to mild localized infection, sub-clinical disease with delayed course, and an acute fulminant disease with widespread bacterial dissemination and septicemia with a mortality of about 90%<sup>2</sup>. The long period of dormancy before manifestation of disease, at times has given rise to the

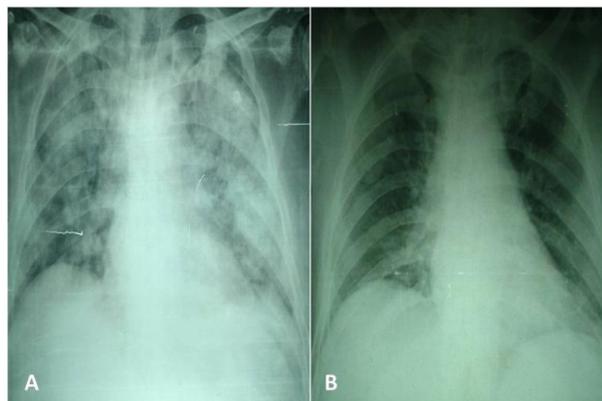
nick name "Vietnam bomb"<sup>3</sup>. Patients with diabetes are most susceptible to this disease and other risk factors include renal disease, chronic lung disease, exposure to the soil and stagnant waters and alcoholism<sup>4,5</sup>. Most of the cases go unnoticed and unreported due to lack of clinical awareness and diagnostic microbiological services, suggesting that this disease is more common than currently appreciated. We present here a series of three cases of melioidosis involving lung and pleura along with clinico radiological and treatment details.

### Case series

#### Case 1

A 70 year old male presented to our emergency department with complaints of breathlessness, cough with expectoration and high grade fever of one week duration. He was a known diabetic and

gardener by occupation. Prior to this admission he was treated symptomatically with antibiotics by a local medical practitioner. He had no past history of tuberculosis or bronchial asthma. On examination he was febrile, tachypneic and his arterial blood gas analysis (ABG) showed type 1 respiratory failure with oxygen saturation of 83% on room air. His total leukocyte counts and blood sugars were elevated with normal liver and renal function tests. Lung auscultation revealed bilateral fine crepitations. Chest radiograph showed bilateral homogenous opacities suggestive of consolidation (Fig 1A). On further worsening of his clinical condition he was intubated and connected to mechanical ventilation. High resolution computed tomography (HRCT) of chest was done which showed bilateral diffuse consolidation with minimal pleural effusion. Patient underwent bronchoscopy which revealed diffuse erythematous bronchial mucosa. His bronchial wash culture and blood culture both showed growth of *Burkholderia pseudomallei*. He was started on dual antibiotics (Meropenem 1 gram every 8 hourly and Co-trimoxazole 320/1600 mg every 12 hourly intravenously according to his body weight). Patient improved symptomatically and was successfully extubated. He was discharged after 2 weeks with maintenance therapy of oral Co-trimoxazole (320/1600mg every 12 hourly) for 4 months. He had a complete clinical and radiological resolution (Fig 1B) and is under regular follow up.

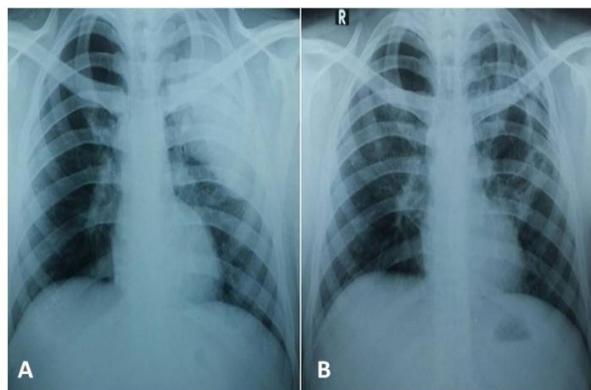


**Fig 1.** (A) Chest radiograph showing bilateral homogenous opacities suggestive of consolidation. (B) Repeat chest radiograph after 4 months showing complete resolution of the lesions

### Case 2

A 36 year old male presented with complaints of high grade fever with chills and rigors and right sided chest pain of 15 days duration. He had a history of cough with scanty expectoration and mild breathlessness for the same duration. He was a known diabetic and chronic alcoholic. He had no past history of tuberculosis or bronchial asthma.

On examination he was febrile, tachypneic with elevated total leukocyte counts and blood sugars. Lung auscultation revealed diminished breath sounds on right side of chest. His chest radiograph revealed right side pleural based homogenous opacity suggestive of loculated empyema.(Figure 2A) Blood culture was sent and a diagnostic pleural fluid aspirate revealed pus which was sent for culture and sensitivity. In view of persisting fever and worsening clinical condition, a pig tail insertion into pleura was done and around 450 ml of pus was drained. Meanwhile his pleural pus and blood cultures both showed growth of *Burkholderia pseudomallei*. He was started on dual antibiotics (Meropenem 1 gram every 8 hourly and Co-trimoxazole 320/1600 mg every 12 hourly intravenously according to his body weight). After clinical and radiological resolution (Figure 2B) pig tail tube was removed. Subsequently he was discharged after 2 weeks with oral Co-trimoxazole maintenance therapy (320/1600mg every 12 hourly) for 4 months.



**Fig 2.** (A) Chest radiograph showing right side pleural based homogenous opacity suggestive of loculated empyema. (B) Chest radiograph after removal of pig tail showing clearance of empyema

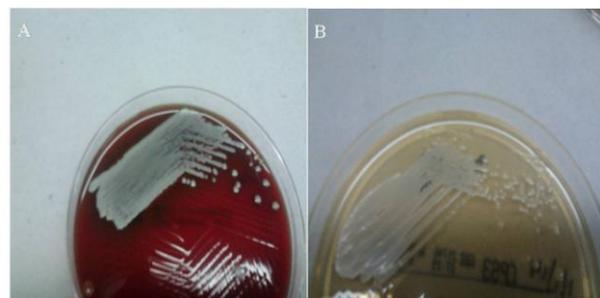
### Case 3

A 38 year old female presented to our emergency department with complaints of high grade fever with chills and rigors of 20 days duration. She had a history of cough with scanty mucoid expectoration along with breathlessness of 15 days duration. There was no history of chest pain, hemoptysis, loss of weight and appetite. She was a farmer by occupation and not a known diabetic or hypertensive. On examination she was febrile, tachypneic with elevated total leukocyte counts of  $17600/\text{mm}^3$  along with decreased platelet counts ( $60,000/\text{mm}^3$ ). Her liver function test revealed serum bilirubin of 5.2mg/dl along with elevated liver enzymes. Her arterial blood gas analysis (ABG) showed type 1 respiratory failure with oxygen saturation of 85% on room air. Her chest radiograph

revealed left lower zone consolidation (Fig 3). She was started on intravenous antibiotics (Meropenam 1 gram every 8 hourly and doxycycline 100mg every 12 hourly). In view of her respiratory distress patient was intubated and connected to mechanical ventilation. Her blood cultures and endotracheal secretions cultures both showed growth of *Burkholderia pseudomallei*. She was started on Co-trimoxazole 320/1600 mg every 12 hourly intravenously. Later she developed acute kidney injury and metabolic acidosis. Her clinical condition deteriorated further and in spite of our best efforts to revive, she succumbed to sepsis and ARDS.



**Fig 3.** Chest radiograph showing left lower zone consolidation



**Fig 4.** Aerobic culture showed shiny carrom coin appearance on (a) 5% sheep blood agar (b) chrome agar (CPS) after 48 hrs at 37°C

## Discussion

*Burkholderia pseudomallei* previously known as *Pseudomonas pseudomallei*, is the causative agent of melioidosis, a glanders like disease in rodents in South Asia and North Australia<sup>6</sup>. It is a saprophytic organism distributed in soil and stagnant waters which affects almost any organ in the body with pneumonia being the most common presentation in many series. Transmission of the disease occurs through direct skin inoculation, inhalation and ingestion<sup>1</sup>. High annual rainfall in monsoon, high population of diabetes, agriculture as the main occupation can explain the predominance of the disease in south

western coastal belts<sup>5,7</sup>. The disease is highly prevalent in males due to more frequent exposure to soil and stagnant water, a greater incidence of alcoholism and diabetes as a risk factors<sup>8</sup>.

The most common clinical presentation include fever, pneumonia, pleural effusions, hepatosplenomegaly, localized abscesses and septicemia<sup>4,5,8</sup>. Pulmonary melioidosis is the most common presentation with pneumonia and septic shock being the cause for highest mortality<sup>5,7</sup>. Irrespective of clinical manifestation, appropriate radiological imaging of chest, abdomen and pelvis is recommended for all patients with melioidosis to look for localized abscesses. Chronic melioidosis can often present with pleural effusions in fifteen percent of the cases<sup>6</sup>. The disease can often relapse (10%) and patients should be followed up accordingly<sup>9</sup>.

A definitive diagnosis of melioidosis can be made by culturing the organism from a clinical sample (sputum, urine, pus, pleural collection, blood, or throat swab)<sup>9,10</sup>. Pulmonary melioidosis can mimic pulmonary tuberculosis, both clinically and radiologically in endemic areas, and only way to differentiate from tuberculosis is by isolation of *B. pseudomallei* in culture<sup>10</sup>.

According to international consensus recommendations for the treatment and prophylaxis of melioidosis<sup>11</sup>, patients diagnosed are managed with an initial intensive antibiotic regimen with intravenous (IV) ceftazidime 50 mg/kg every six hours for 14 days followed by eradication phase with oral trimethoprim/sulfamethoxazole (co-trimoxazole) 320/1600 mg/kg every 12 hourly for three months. Upon clinical improvement patients are switched to oral medication with co-trimoxazole and should be given until 20 weeks to prevent recurrence. Cefazidime is the mainstay of intensive treatment, with carbapenems reserved for treatment failures or severe infections. Co-trimoxazole is preferred for the eradication phase, with the alternative of amoxicillin/clavulanic acid<sup>11</sup>.

High index of suspicion should be made in febrile patients of predominant occupational and agricultural profession and also in patients returning from endemic regions particularly with diabetes as a risk factor<sup>1,12</sup>. High clinical awareness, facilitating rapid and accurate diagnosis by expert personnel and strict adhering to treatment guidelines is essential for improving the mortality as evident in the recent literature<sup>1</sup>. The key for successful treatment lies in the timely selection of adequate sensitive antibiotics. Melioidosis is a treatable emerging infection in India and should be considered as an opportunistic infection in immunocompromised individuals.

**Conflict of interest:** Nil

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