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Case Report

Melioidosis presenting with multiple lung and liver abscesses

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Introduction

Melioidosis is an infection caused by the Gram-negative bacillus *Burkholderia pseudomallei* [1]. It is most predominant in South-East Asia, South Asia and Northern Australia. The infection may present with a variety of clinical presentations such as acute or chronic, localized or disseminated types. Patients at risk of developing an infection with this organism are immunocompromised adults, organ transplant recipients, diabetics and alcohol abusers [2].

Case report

A 39-year-old businessman was admitted with a history of high fever with chills and rigors with constitutional symptoms of 12 days duration. He had watery diarrhoea and a dry cough. He had recently travelled to Kataragama and went on safari to Yala and had a river bath. He complained of polyuria and polydipsia during last 3 months.

On admission, he was febrile with a temperature of 104°F. His vital parameters were a pulse rate of 90 beats/min, blood pressure of 110/70mmHg and a respiratory rate of 20 breaths/min. He was not in severe distress. On auscultation, there were crepitations over the lower zone of the left lung. The rest of the examination was unremarkable.

His initial laboratory workup revealed a white cell count (WCC) of 10.52×10^9/L with neutrophils 88%, platelet count of 290×10^9/L, haemoglobin of 14.2g/dL, C-reactive protein of 258 mg/L, erythrocyte sedimentation rate of 142mm/1st hour and normal renal and liver functions. He was found to have a high random glucose level of 345mg/dL. The initial chest radiographs (CXR) showed multiple small abscesses in the left lower zone. The patient was treated with intravenous (IV) cefotaxime 1g 12 hourly after taking blood and urine for culture.

The patient did not show any clinical improvement after three days of intravenous antibiotics and continued to have a high fever. Thereafter, cefotaxime was stopped, and he was commenced on IV piperacillin-tazobactam 4.5gram 8 hourly. Ultrasound abdomen revealed multiple, well defined echogenic lesions involving the left and right

lobe of the liver, largest measuring 1cm x 1cm x 2cm with a thickened wall.

Blood culture yielded a Gram-negative bacillus with a positive oxidase reaction. The isolate was sent for identification by the Phoenix identification system at the Medical Research Institute and reported as *Burkholderia gladioli.* Because of poor response to piperacillin and multiple lung abscesses, the isolate was sent to the Department of Microbiology, Faculty of Medicine, University of Colombo and identified as *Burkholderia pseudomallei* by PCR. Melioidosis antibody was strongly positive at a titre of 1:1280.

The antibiotic was changed to meropenem 1g 8 hourly. Repeat chest radiograph after 2 days of meropenem showed features of resolving abscesses. Contrast-enhanced computed tomography (CECT) of chest, abdomen and pelvis showed focal areas of bronchiectasis with small cavities in the left upper lobe of the lung with multiple small lymph nodes seen in the cervical, mediastinal and para-aortic areas. There were multiple small cavities in both lobes of the liver. There were no other collections /abscesses seen in the neck, chest, abdomen or pelvis. He became afebrile after 2 days of meropenem and it was continued for 2 weeks.

The patient was successfully treated with 2 weeks of IV meropenem. Subsequently, he was discharged from the ward on oral cotrimoxazole and doxycycline for 3 months. The patient was regularly followed up at the clinic. His melioidosis antibody titre was negative at the end of 3 months.

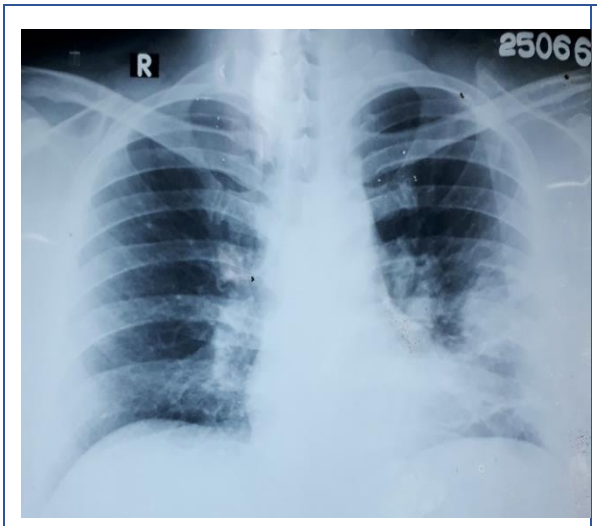

Figure1 A: Multiple small abscesses in the left lower zone of the lung

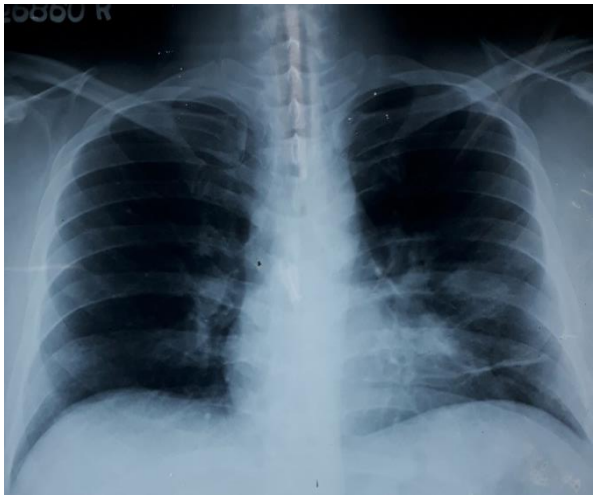

Figure 1B: Resolving abscesses

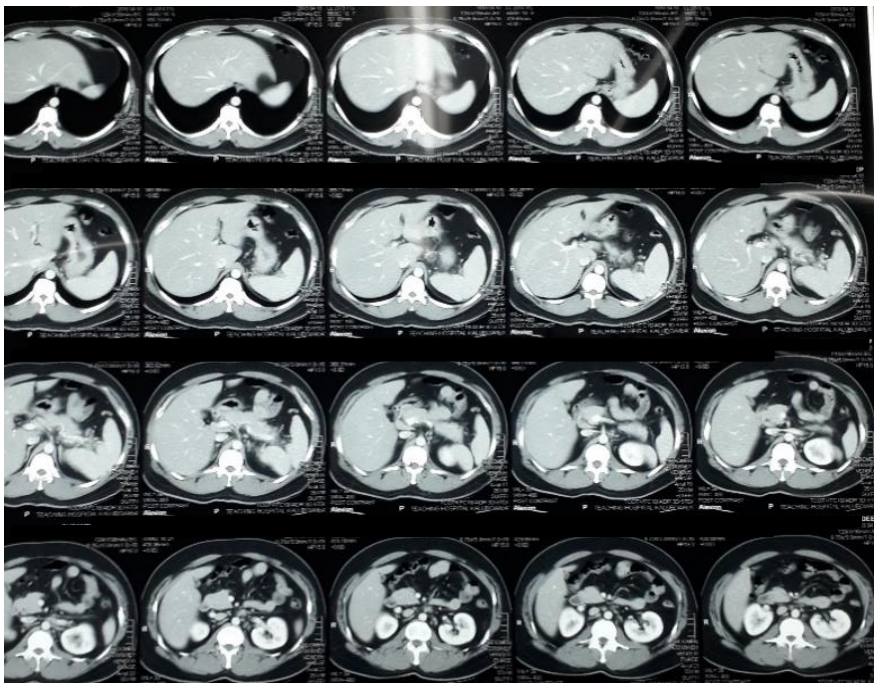

Figure 2: Contrast-enhanced computed tomography (CECT) of chest, abdomen and pelvis showed focal areas of bronchiectasis with small cavities in the left upper lobe of lung with multiple small lymph nodes seen in cervical, mediastinal and paraaortic areas. There were multiple small cavities in both lobes of the liver. But there was no other collection /abscess seen in neck, chest, abdomen or pelvis

Discussion

Melioidosis is a bacterial infection caused by *Burkholderia pseudomallei* which is a facultative intracellular Gram-negative bacillus. It causes significant morbidity and mortality despite effective treatment and can give rise to reinfection and recurrences. Sri Lanka is located in the meliodosis- endemic belt. This includes countries in the range of 5°N to 20°N of the equator which have comparable climate and conditions [1]. The first case of melioidosis from Sri Lanka was reported in a European tea broker in 1927 [3]. It is severely underreported in several countries.

Burkholderia pseudomallei is a widely distributed saprophyte in soil, mud and surface water in endemic areas. It is mainly transmitted to humans via percutaneous inoculation from the soil. But it can be acquired through inhalation and ingestion [4]. The patient had an exposure to surface water and mud. This organism is known to cause localized infection, septicaemia, asymptomatic infections, pneumonia, visceral abscesses, neurological and musculoskeletal infections [5].

The gold standard test to confirm clinically suspected melioidosis is by isolation of the organism from specimens such as blood, throat, urine, respiratory secretions, pus, and surface lesion. It has 100% specificity, but sensitivity may vary, depending on the culture media used and the skill of the microbiologist.

Identification of *Burkholderia pseudomallei* from the culture supernatants is best done by polymerase chain reaction [6]. Recent, advanced techniques based on mass spectrometry, such as matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF-MS) and metabolomic profiling with help of ultra-high-performance liquid chromatography-electrospray ionization-quadruple-time of flight-mass spectrometry (UHPLC-ESI-Q-TOF-MS) have also been found to be potentially useful in distinguishing it from other *Burkholderia* spp. [7].

The currently recommended mainstay of melioidosis treatment is antibiotics which consists of two phases: the initial intensive phase and the eradication phase. The main aim of the initial intensive phase is to prevent patients from dying of overwhelming sepsis and the eradication phase aims to eradicate bacteria to minimise the risk of relapse [8]. The drug of choice for the initial intravenous intensive phase of treatment is either ceftazidime or a carbapenem (either meropenem or imipenem) antibiotic, which is given for at least 14 days [9]. For severe cases, intravenous therapy can be extended up to 6 weeks. After receiving the intensive phase of therapy, patients require an extended period of oral antimicrobial therapy for a minimum of 12 weeks. Commonly used first-line drug for the eradication phase is oral co-trimoxazole based on clinical efficacy. An observational study found no added benefit by adding a second agent such as doxycycline to co-trimoxazole [8].

Conclusion

Melioidosis is an emerging infection in Sri Lanka. The treating physician should have a high degree of suspicion in making the diagnosis in a patient who presents with varied clinical manifestations. Early recognition with optimal treatment can maximize the chance of complete recovery (as in our patient).

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