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Research Article

EMPYEMA THORACIS IN MELIOIDOSIS SUCCESSFULLY TREATED WITH MEDICAL THERAPY

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A R T I C L E I N F O

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A high index of suspicion is required in making the diagnosis.

A B S T R A C T

Melioidosis is endemic in Asia and it is also a great mimicker. A high index of suspicion is required in making the diagnosis. We reported a case of empyema thoracis secondary to melioidosis which was successfully treated using intravenous ceftazidime for 21 days during intensive phase, followed by maintenance therapy using Co-trimoxazole for 20 weeks. Apart from that, intrapleural streptokinase was used to promote drainage of empyema. Patient recovered well with evidence of resolution of empyema on chest imaging.

INTRODUCTION

Background

Melioidosis is one of the important diseases in the tropics that may present with sepsis (1). It is caused by *Burkholderia pseudomallei,* a gram negative soil saprophyte. The range of clinical presentation and symptoms are widely variable, often mimic other causes of sepsis and thus making a diagnosis difficult.

In endemic areas, a high index of suspicion and a good travel history from patients coming from non-endemic regions are important factors to emphasis in establishing the diagnosis. Melioidosis should be considered in the differential diagnosis of any febrile illness, if the presenting features are those of fulminant respiratory failure; multiple pustular, necrotic or subcutaneous lesions; or if there is a radiological pattern of tuberculosis from which tubercle bacilli cannot be demonstrated, especially in a patient who is immunocompromised, has diabetes mellitus, and either resides or has travelled to endemic areas (2).

Case Presentation

A 32-year- old man presented with high grade fever for one month predominantly towards the evening, associated with chills and rigors. He also complained of cough for two weeks with expectoration of yellowish sputum, shortness of breath and right sided chest pain. He also experienced intermittent vomiting, arthralgia, headache and poor oral intake.

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He had visited general practitioner twice and was treated with a course of antibiotic for non-specific infection.

He had diabetes mellitus for 2 years, on insulin therapy but was not compliant to treatment. Otherwise, he had no history of travelling, jungle trekking, swimming in the river or frequent exposure to soil. There was no history of prior tuberculosis or contact with tuberculosis patient. He was an active smoker of 10 pack-years. He worked as a contractor.

On examination he had Grade 1 finger clubbing with nicotinic stains. Lungs examination revealed abnormalities confined to the right chest with absent breath sound, reduced chest expansion and vocal fremitus. On percussion, there was hyper-resonant of the right middle and upper zones. There was no lymphadenopathy or skin lesion. On abdominal examination, he had hepatomegaly of 4 cm below the right costal margin and a palpable splenic tip with dull Traube's space.

Investigations

There was leucocytosis and anemia with white cell counts of 27,000, haemoglobin of 10.0 g/dL, platelet of 681,000/L. His erythrocyte sedimentation rate was raised at 119 mm/hr and C-reactive protein also raised >160 mg/L. Liver and renal function tests were normal.

Initial chest radiograph showed features of pleural effusion with loculated air pocket over the right lung field (as shown in Figure 1)

CT scan thorax (as shown in Figure 3a,b) confirmed the findings which showed collapse of the right lung with presence of single , large loculated air-fluid collection within

the pleura space and multiple smaller loculated air-filled collections over the lower half of the right hemi thorax.

5 mg once a day was also added in the intensive therapy regime. Besides systemic antibiotics, intrapleural streptokinase of 250,000 U was also given for 5 doses in view of poor drainage of the multiloculated empyema.

Before treatment

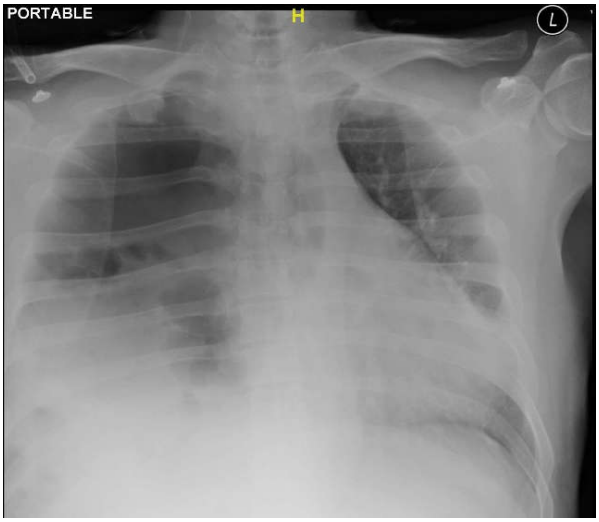

Figure 1

After treatment

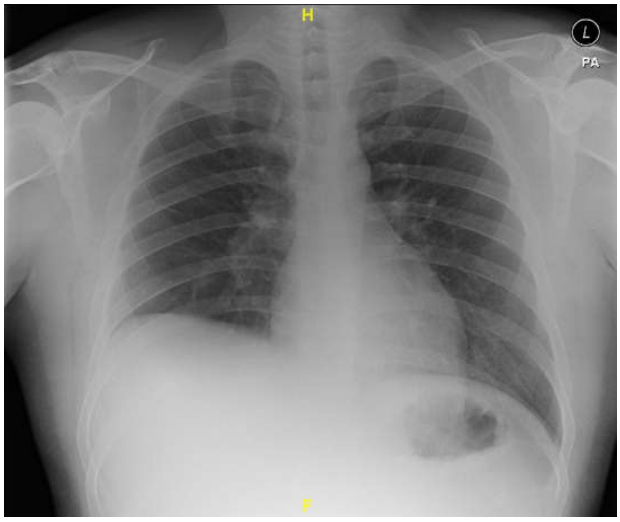

Figure 2

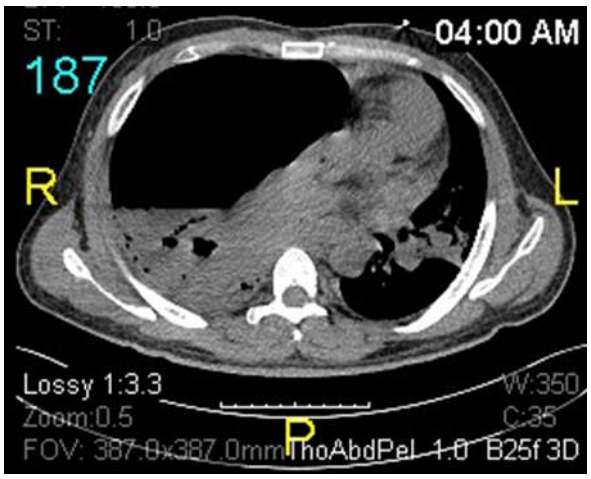

Figure 3a

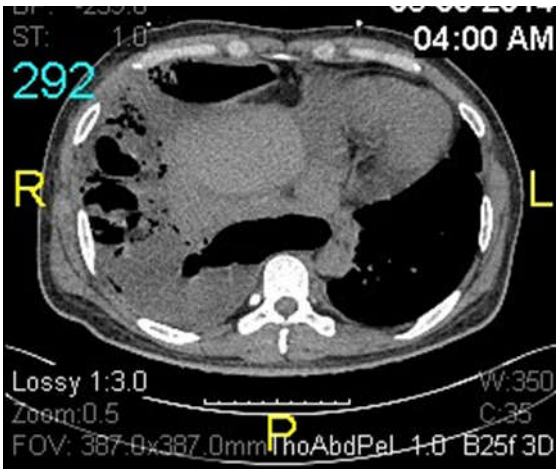

Figure 3b

At the right basal region, there are multiple foci of air with destruction of the lung parenchyma in keeping with macerated lung.

A right chest tube was inserted which drained straw-coloured, exudative type of pleural fluid that mixed with pus. Due to high index of suspicion of meliodiosis, he was empirically started on IV Ceftazidime 2 gram TDS.

The pleural fluid culture and sensitivity later isolated *Burkholderiapseudomallei.*

Differential Diagnosis

Screening for tuberculosis (TB) such as sputum and pleural fluid staining for acid fast bacilli, tuberculin test and pleural fluid for TB PCR were all negative.

Treatment

Intensive therapy with IV Ceftazidime 2 gram tds was given for 21 days followed by oral co-trimoxazole 320 mg/1600 mg twice daily for a complete course of 5 months. Oral folic acid

Outcome and Follow-Up

He was discharged well after completed the intensive therapy. A follow-up chest radiograph which was done two weeks later, showed a dramatic improvement without any residual lung empyema (as shown in Figure 2).

DISCUSSION

Our patient has the typical demographic characteristics of melioidosis infection in Malaysia. A middle-aged patient with uncontrolled diabetes mellitus presented with severe right lung infection.

Melioidosis is caused by *Burkholderiapseudomallei*, a gram-negative environmental saprophyte. It is endemic in southeast-Asia and tropical Australia(1) but the cases are under-reported in Malaysia as it is not a notifiable disease.

Empyema thoracis is a rare complication of melioidosis. The typical clinical features of melioidosis are virtually impossible to be defined. The symptoms and signs can range from mild skin and soft tissue infections to a severe fulminant and fatal

septicaemia. Due to this wide array of clinical manifestation, the causative pathogen *Burkholderiapseudomallei h*as been called "the great mimicker"(1). One of the most important differential diagnoses that needed to be ruled out is tuberculosis. For our patient, works up for tuberculosis (TB) were all negative.

During the induction phase of therapy, ceftazidime is the choice of drug for initial therapy for most patients. Imipenem (50-60 mg/kg/day) is as effective in severe melioidosis. In a trial conducted in Thailand, there were no difference on mortality but there were fewer treatment failure in patients who were treated with imipenem(3). An observational data from Australia had showed that comparing with ceftazidime, meropenem is associated with better outcomes in cases of severe melioidosis. Therefore, recommendation for using meropenem in severe melioidosis with septic shock requiring ICU admission or neurological melioidosis(4). However, there is still no evidence that ceftazidime is inferior compare to meropenem in patients who are not critically ill(5). Duration of intravenous antibiotics is used for minimum of 10 to 14 days with exception of patient who are critically ill, extensive pulmonary disease, deep seated or organ abscess, osteomyelitis, septic arthritis and neurologic melioidosis where the duration is prolonged 4 to 8 weeks.(5) For our patient, he was not critically ill with extensive pulmonary disease, he was treated with Ceftazidime 2g TDS for up to 21 days.

Induction phase with intravenous antibiotics will be followed by a maintenance phase with oral antibiotics. Follow-up is necessary because of the high risk of relapse, latency and recurrence which may lead to an acute, often fulminating, fatal infection. Long courses of oral maintenance therapy have been recommended in order to eradicate melioidosis which has the similar concept with anti-tuberculosis treatment. Co-trimaxazole, doxycycline or amoxicillin-clavulanate is the most widely used oral combination for maintenance therapy for melioidosis(6). Co-trimoxazole dosage depending on the weight of patient is the agent of choice for initial eradication. Folic acid 5 mg once a day orally is also added to the regime and continued for 3 months further(5).

For eradication, our patient received co-trimaxazole 320/1200 mg BD for up to 20 weeks. Guidelines for the optimal duration of maintenance antibiotic therapy are not well-established, although duration of 3 to 6 months has been mentioned in many reports(7). 3 months for complicated pneumonia, skin abscess, bacteremia without any foci of infection and deep-seated abscess while 6 months for osteomyelitis and central nervous system infection(5). Lai and Tsang (8) in Hong Kong also reported a similar case of empyema thoracis in melioidosis in which the patient was treated with a course of antibiotics, but required a repeated admission to the thoraco-surgical unit for surgical debridement and drainage of empyema. As a contrast to our patient, we managed to treat the multiloculated empyema successfully with medical therapy alone without needing for surgical intervention.

The used of intra-pleural streptokinase is shown to be effective in draining the empyema in our case, whereby avoiding open surgery. Streptokinase has been shown to disrupt fibrinous septations within complicated effusions and empyema. At present, the routine use of intra-pleural fibrinolytic therapy alone is not supported by available evidence. However, in patients with a large, poorly draining, complicated effusion which cause ventilation problem, especially in patients where the surgical procedure deems to be high risk, there may be a role for combined intra-pleural t-PA and DNase(9).

Learning Points

1. Empyema thoracis is a rare complication of melioidosis.
2. In endemic area, a high index of suspicion of melioidosis is needed especially when patients who are immunocompromised or has diabetes mellitus present with febrile illness associated with respiratory failure and radiological pattern of pulmonary tuberculosis but tubercle bacilli cannot be demonstrated.
3. Timely antibiotics therapy given in a correct dosage can help to reduce mortality.
4. Intrapleural streptokinase may be useful in situation where melioidosis is complicated with multiloculated empyema.

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