

The Bug and the Big Heart --Melioidotic Pericardial Effusion

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SUMMARY

Melioidosis is an infection caused by Gram negative bacterium *Burkholderia pseudomallei* leading to abscesses in lungs, liver, spleen, musculoskeletal system, prostate and sepsis. We present a rare case of purulent pericardial effusion caused by melioidosis with concomitant pneumonia and splenic abscesses. The patient underwent pericardiocentesis and successfully recovered from cardiogenic and septic shock.

KEY WORDS:

Pericardial effusion, Cardiac tamponade, Splenic abscess, Melioidosis

A 54-year-old man and a chronic smoker, was a palm oil plantation settler in the state of Pahang, Malaysia with type 2 diabetes mellitus (DM) and ischaemic heart disease. He was on metformin 250mg three times daily and acetylsalicylate 75mg daily from his local health clinic. He started to have shortness of breath, reduced effort tolerance and chest discomfort, which gradually deteriorated over a period of one month. There was no fever. He presented to the local district hospital and was immediately referred to a tertiary hospital.

On arrival at the emergency department, he had hypotension, tachycardia, raised jugular venous pressure, pulsus alternans and tachypnoea. Arterial blood gases showed type I respiratory failure. His condition was aggravated by the presence of heart failure and pulmonary oedema. The chest X-ray (CXR) showed gross cardiomegaly which was globular in shape with a cardiothoracic ratio of 80%. Small complexes electrocardiogram was noted. Prompt bedside echocardiograph (ECHO) examination revealed a global pericardial effusion 5-6 cm in depth. The right ventricle (RV) and right atrium (RA) were collapsed during diastole and ejection fraction was only 20%.

He was ventilated for respiratory distress using SIMV mode and started on inotropic support. Urgent pericardiocentesis was performed for the cardiac tamponade. Purulent haemorrhagic fluid was aspirated at first and later, drainage was set in free-flow using a pig-tail catheter. The blood pressure improved after pericardiocentesis. Intravenous (IV) ceftazidime 2g 8 hourly, IV cloxacillin 2g 6 hourly and IV metronidazole 500mg 8 hourly were commenced. Both pericardial fluid and blood cultures grew *Burkholderia pseudomalleus* which was sensitive to ceftazidime, ciprofloxacin, imipenem, and amoxicillin-clavulanic acid but resistant to trimethoprim-sulfamethoxazole. He was subsequently continued with ceftazidime 2 g 8 hourly only.

Ultrasound abdomen showed homogeneously enlarged liver and possible multiple micro-abscesses in the spleen. A computed tomography scan of the abdomen confirmed the presence of small abscesses in the spleen. On day thirteen of hospitalisation the pig-tail catheter draining the pericardial effusion was accidentally dislodged. Repeated ECHO showed minimal pericardial effusion, with no RA/RV diastolic collapse and left ventricular ejection fraction improved to 52%.

He was given intravenous ceftazidime 2gm 8 hourly for total of six weeks. He recovered well in the ward. He was discharged with oral doxycycline 100mg twice daily and trimethoprim-sulfamethoxazole 160mg/800mg twice daily as eradication therapy for 20 weeks. The regime was however extended to a total of 6 months after interim 3rd month surveillance indirect fluorescent antibody titre remained significant at 1:160, which later dropped to <1:80 at the next follow-up visit. He remained well since discharged.

Melioidosis is caused by *Burkholderia pseudomallei*, a Gram negative bacillus commonly found in the soil of tropical countries especially in the agricultural belt as is the state of Pahang in Malaysia. The incidence of melioidosis varies from 1.7 per 100 000 population per year in Singapore¹ to 16.5 per 100 000 population per year in Northern Australia². In Pahang, it commonly afflicts the 40 to 60-year-old age group with predisposing risk factors such as involvement in farming, diabetes mellitus, chronic renal failure, steroid usage and alcoholism³. The mode of transmission is postulated to be through direct entry into skin wound or via inhalation. Melioidosis can present clinically in acute or chronic form. The bacteraemic form has a predilection for abscesses formation in many organs such as the lung, musculoskeletal system, liver, spleen and prostate. Patients with bacteraemic melioidosis face a 54% mortality rate in Malaysia³.

Melioidosis with cardiac involvement is rare and is often combined with septicemia, for which the mortality rate is 20–60%⁴. This patient survived from cardiogenic and septic shock because early intervention and aggressive treatment was given. In view of multiple organ involvement, underlying DM, it was appropriate to suspect melioidosis in this patient. Even though he was put on vasopressors to support the blood pressure, he needed urgent pericardiocentesis as he was haemodynamically unstable with large significant pericardial effusion and RA/RV diastole collapse.

As much as pericardial effusion should be drained to improve the tamponading effect, cardiac contractility and cardiac

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output, pericardiocentesis also lessens the likelihood of consequent constrictive pericarditis. Appropriate empirical broad spectrum antibiotics such as ceftazidime, meropenem or imipenem should be promptly initiated in the intensive care unit for life threatening melioidosis and continued for 2-4 weeks in the intensive phase. Then dual antibiotics regime such as trimethoprim/sulfamethoxazole and doxycycline should be given for eradication phase for about 20 weeks or longer if recovery is complicated. Trimethoprim/sulfamethoxazole is commonly used to treat melioidosis. Antimicrobial susceptibility using the disc diffusion method in our hospital is also widely practised in melioidosis-endemic areas, but may overestimate resistance to trimethoprim/sulfamethoxazole. E-test is a better tool as compared to disc diffusion method for antimicrobial susceptibility testing for *Burkholderia pseudomallei*⁵.

In conclusion, early diagnosis and appropriate antibiotic treatment for melioidosis can reduce mortality rate. As melioidosis has a propensity for multi organ involvement, physicians should look for pericardial involvement as simple pericardiocentesis can be life saving.

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