

Burkholderia pseudomallei pericarditis as a mimicker of tuberculous pericarditis: a case report

Frederick HC Lau *, MB, BS, MF Lin, MB, BS, FHKAM (Surgery), WS Ng, MB, BS, FHKAM (Surgery)

Department of Cardiothoracic Surgery, Queen Elizabeth Hospital, Hong Kong SAR, China

* Corresponding author: hcf.lau@ha.org.hk

This article was published on 17 Apr 2024 at www.hkmj.org.

Hong Kong Med J 2024;30:167–9
<https://doi.org/10.12809/hkmj2310671>

Introduction

Melioidosis, also known as Whitmore's disease, occurs predominantly in tropical climates and can cause pneumonia, soft tissue infection, brain abscess, and septicaemia. Very few cases of melioidosis pericarditis have been reported. The most common cause of constrictive pericarditis in Hong Kong is tuberculosis. We report a patient with melioidosis constrictive pericarditis with presentation mimicking tuberculous pericarditis infection in whom we performed pericardiectomy.

Case presentation

A 61-year-old man who was a chronic smoker and worked on a construction site presented with fever and heart failure symptoms including dyspnoea, orthopnoea, and ankle oedema. Laboratory results showed elevated white blood cell count ($21.7 \times 10^9/L$) with neutrophils predominant ($19 \times 10^9/L$) and raised levels of C-reactive protein (303 mg/L) and liver parenchymal enzymes (alanine transaminase level: 153 U/L, alkaline phosphate level: 125 U/L). Repeated blood cultures were negative. Sputum for acid-fast bacilli smear and culture and *Mycobacterium tuberculosis* polymerase chain reaction were negative. Computed tomography (CT) with contrast showed bilateral multiple small lung nodules (largest 1.3 cm) with mediastinal and right hilar lymphadenopathy. Transthoracic echocardiogram revealed bilateral pleural effusion with pericardial effusion requiring pericardial drain insertion 2 days after admission. Analysis of pericardial fluid showed elevated adenosine deaminase (ADA) level (58 U/L) and culture showed scanty growth of pseudomonal species after 6 days. No *Mycobacterium* species was isolated after 6 weeks of incubation. The patient was commenced on empiric antituberculosis treatment (isoniazid 300 mg daily, rifampicin 600 mg daily, pyrazinamide 1500 mg daily, ethambutol 900 mg daily, and pyridoxine 20 mg daily) 3 weeks after admission in view of the elevated ADA level, persistent intermittent fever while on intravenous piperacillin/tazobactam and due to the risk of tuberculous pericarditis in Hong Kong. He was

discharged and referred to our cardiothoracic centre for elective pericardial biopsy.

While waiting for our outpatient clinic assessment, the patient was admitted as an emergency 1 month after commencing antituberculosis treatment with shortness of breath and frequent episodes of atrial flutter. He was later transferred to our cardiothoracic unit for further management. Echocardiogram and CT scan of the thorax showed a large heterogeneous pericardial collection with adhesions and internal echogenicities of up to 3.5 cm in diameter, located next to the left ventricle with signs of compression and constriction (Fig 1). There were also signs of septal bounce and exaggerated respirophasic changes of tricuspid and mitral inflow. Left and right ventricular systolic function was reduced due to impaired bi-ventricular contractility caused by pericardial adhesions and constriction, confirmed by right heart catheterisation (high right ventricular end-diastolic pressure-to-right ventricular systolic pressure ratio, discordance between left ventricular systolic pressure and right ventricular systolic pressure during respiration).

Pericardiectomy was performed and the excised pericardium sent for sectioning revealed suppurative granulomatous inflammation (Fig 2). The Ziehl-Neelsen stain and *Mycobacterium tuberculosis* polymerase chain reaction were negative. Pericardial pus aspirate contained *Burkholderia pseudomallei* species.

Antituberculosis treatment was withheld and melioidosis was treated with intravenous meropenem for 4 weeks and oral co-trimoxazole with doxycycline as maintenance therapy. The patient's postoperative course was uneventful. Postoperative CT of the thorax at 3 months showed reduced pericardial effusion, decreased lung consolidation, and reduced pleural effusion.

Discussion

Melioidosis is caused by intracellular Gram-negative saprophytic *B pseudomallei*. This bacterium was formerly classified in the genus *Pseudomonas* but is now separated from *Pseudomonas* and

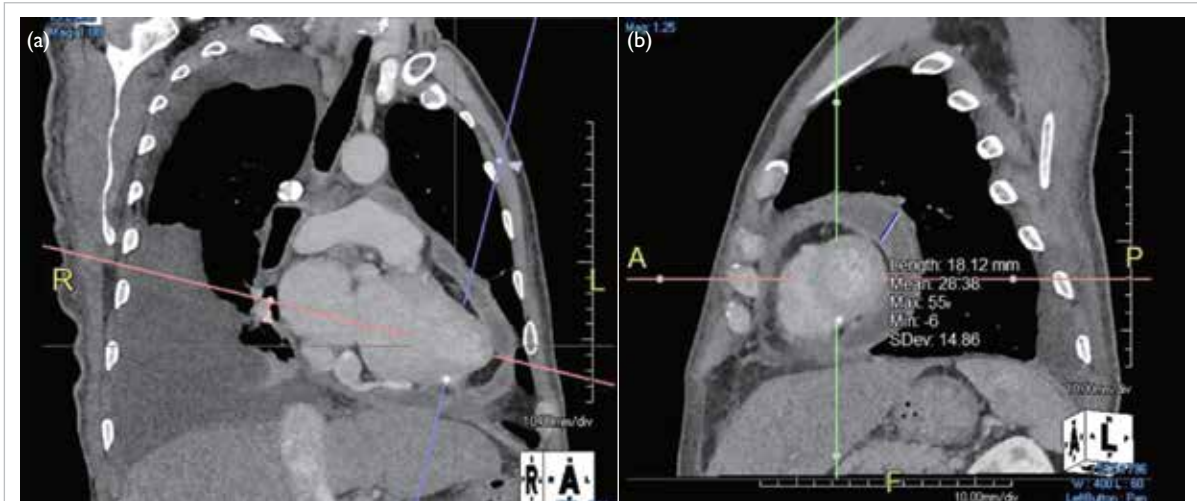


FIG 1. Preoperative computed tomography scan of the thorax showing pericardial collection with adhesions and internal echogenicities (a), leading to compression and constriction of the left ventricle (b)



FIG 2. Intraoperative photo during pericardiectomy. Thick yellowish material was expressed after pericardium incision

Stenotrophomonas. It is predominantly found in contaminated water and soil and spread to humans through direct contact with contaminated sources. Melioidosis is a multiorgan infectious disease with pneumonia as the most common presentation. A progressive increase in the number of cases has been observed in Hong Kong over the last 20 years, as well as in Asia over the past decade.¹ There was no previous reported case of melioidosis pericarditis in Hong Kong.¹

Tuberculosis is caused by the acid-fast bacillus *M tuberculosis*. It is airborne and primarily affects the lungs, and is common in Southeast Asia. The level of ADA, an enzyme in lymphocytes, increases

in the presence of inflammatory effusions caused by bacterial infection, granulomatous inflammation, malignancy, and autoimmune disease. It is typically higher in effusions caused by tuberculosis than those caused by other conditions with a level >40 U/L in lymphocyte-predominant effusions having a sensitivity of 87% to 93% and a specificity of 89% to 97% for tuberculosis.² Nonetheless in neutrophil-predominant effusions, ADA level may lead to false-positive results since ADA is normally elevated.²

Constrictive pericarditis is a disease characterised by pericardial effusion with constrictive pathology. The most common cause is idiopathic, followed by tuberculosis, or post-irradiation and post-pericardiectomy. It is characterised by echocardiography findings of septal bounce, diastolic shift of the interventricular septum, restrictive left ventricular filling pattern, and cardiac catheterisation finding of square root sign.³

The presentation, laboratory results and imaging findings are very similar for melioidosis and tuberculous pericarditis. Most patients have a subacute-to-chronic disease course. The protein, sugar and white cell count of pericardial fluid may also be similar in both diseases. Compared with patients with tuberculous pericarditis, those with melioidosis pericarditis more often have a neutrophil-predominant white blood cell count,⁴ as in our case. Histological findings can show granulomatous inflammation with tuberculosis showing a caseous type.⁵

It is important to differentiate between *B pseudomallei* and *M tuberculosis* and make a correct diagnosis since the treatment for melioidosis

pericarditis and tuberculous pericarditis varies markedly. A prolonged course of intravenous ceftazidime followed by a combination of co-trimoxazole and doxycycline is prescribed for melioidosis while a prolonged course of rifampicin, ethambutol, pyrazinamide and isoniazid is prescribed for tuberculosis.³ An incorrect diagnosis not only delayed treatment for melioidosis in our patient with consequent worsening of his clinical condition, but may also have caused more harm by exposing the patient to the side-effects of tuberculosis treatment. It is important to send pericardial fluid for culture and to look meticulously for the two organisms.

Conclusion

The presentation, laboratory results and imaging findings can be very similar for melioidosis and tuberculous pericarditis. It is important to bear this in mind during investigations for chronic pericarditis and obtain pericardial culture. This will ensure prompt diagnosis and timely commencement of appropriate treatment.

Author contributions

All authors contributed to the concept or design, acquisition of data, analysis or interpretation of data, drafting of the manuscript, and critical revision of the manuscript for important intellectual content. All authors had full access to the data, contributed to the study, approved the final version

for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

Funding/support

This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethics approval

The patient was treated in accordance with the Declaration of Helsinki and provided informed consent for all treatments and procedures, and consent for publication.

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