

Rare *Klebsiella pneumoniae* anterior mediastinal abscess masquerading as cardiac tamponade

Dear Editor,

Mediastinal abscess, an uncommon medical condition caused by remote source of infection, rarely occurs in the absence of trauma or instrumentation. Acute pericarditis with cardiac tamponade, associated with a mediastinal abscess, is a rare clinical presentation; if left untreated, it is potentially fatal. We present a case that encompassed the rare association of a primary gram-negative mediastinal infection, with a reactive pericardial effusion, presenting as pericardial tamponade. The approach to extra-cardiac structure evaluation and the importance of initial wide-sector width image acquisition are detailed in this report.

A 29-year-old man, with medical history of obesity and type 2 diabetes mellitus (glycated haemoglobin/HbA1C 10.5%), presented to the emergency department with a 2-week history of substernal pleuritic chest pain and dyspnea. He was febrile on presentation (temperature 38.4°C), tachycardic (heart rate 112 beats/minute) and hypotensive (blood pressure 89/67mmHg) though saturating normally on room air. Clinical examination revealed muffled heart sounds with jugular venous distension.

Significant laboratory findings included leukocytosis (white cell count $15.17 \times 10^9/L$) with neutrophilia, elevated C-reactive protein of 188mg/L and hyperlactatemia of 3.2mmol/L. Blood culture showed no bacteria growth, and retroviral screen was negative. Electrocardiogram demonstrated widespread ST elevations and PR depression, suggestive of pericarditis. Initial chest radiograph revealed a wide mediastinum (Fig. 1).

Echocardiographic substernal view showed a large pericardial effusion measuring 2.9cm adjacent to the right heart, with right ventricular diastolic collapse. The suspected echogenic structure is seen anterior to the right ventricle. It was initially described as epicardial fat (Fig. 2A).

The clinical diagnosis was acute pericarditis complicated by cardiac tamponade. Urgent pericardiocentesis was done and 410mL of haemoserous fluid was aspirated. Analysis of the pericardial fluid revealed neutrophilic predominance, elevated lactate dehydrogenase, protein, and adeno-deaminase (ADA). It was negative for bacteriology, acid-fast bacilli staining and malignant cells. He was started on high-dose ibuprofen and colchicine.

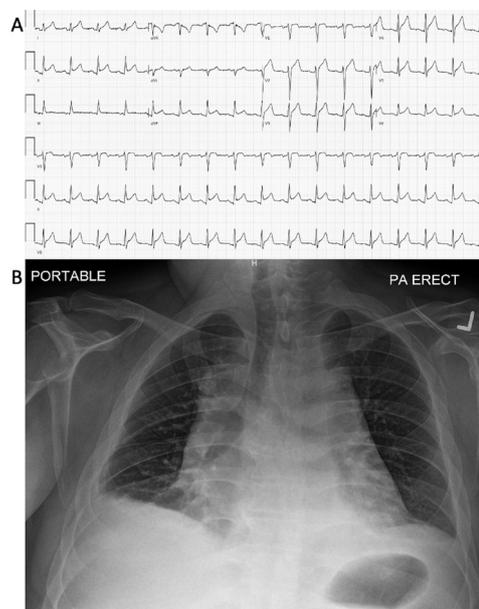


Fig. 1. (A) 12-lead electrocardiogram showing widespread ST elevations and PR depression, suggestive of pericarditis. (B) Initial chest radiograph revealing a wide mediastinum.

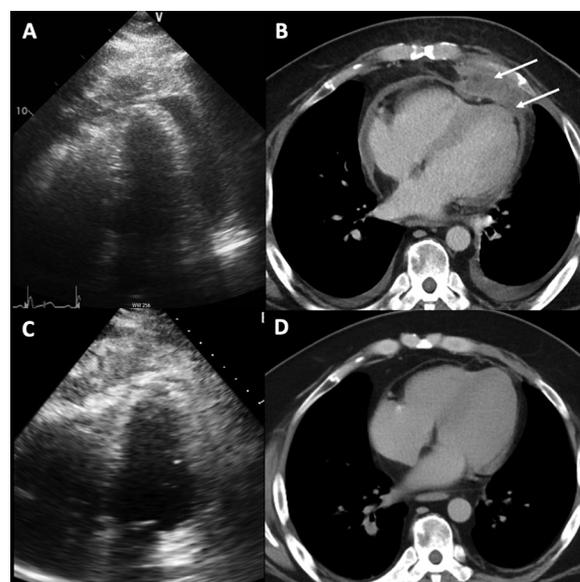


Fig. 2. (A) Echocardiogram before pericardiocentesis demonstrating large pericardial effusion with mixed echogenic density structure surrounding the cardiac apex. (B) Computed tomography (CT) of the thorax showing complex structure (upper arrow) with thick rim enhancement and internal mixed density fluid component centred at the cardiac apex involving the pericardium (lower arrow), measuring 2.9x8.4x6.4cm. This favours an abscess. (C) Repeat echocardiogram after pericardiocentesis. (D) Repeat CT of the thorax 6 months post-drainage showing resolution of pericardial abscess.

Computed tomography (CT) of the thorax revealed a large complex extra-pericardial structure adjacent to the cardiac apex with thick lobulated rim enhancement and internal fluid component (Fig. 2B). CT abdomen and pelvis did not reveal hepatic abscesses or other sources of sepsis that might result in secondary seeding. A follow-up echocardiogram showed a small residual pericardial effusion with a mixed echogenic density structure around the cardiac apex with pericardial margin seen separating the structure (Fig. 2C).

The patient underwent fluoroscopic-guided drainage of the mediastinal abscess. The alternative plan by the cardiothoracic surgeons was pericardiectomy with local drainage and washout if source control was unsuccessful despite fluoroscopic-guided drainage. Fluid culture of the abscess grew pan-sensitive *Klebsiella pneumoniae*. The ADA was 146 U/L. He was commenced on intravenous ceftriaxone for 2 weeks and transitioned to oral ciprofloxacin. CT of the thorax was repeated 6 months later which demonstrated resolution of the mediastinal abscess (Fig. 2D).

This case describes a rare occurrence of mediastinal abscess, a medical condition usually caused by remote source of infection, which has occurred in the absence of trauma or instrumentation.¹ Few case reports have described bacterial pericarditis and pericardial effusion resulting in tamponade,²⁻⁴ with most treated with percutaneous⁴ or surgical drainage^{2,3} and concomitant intravenous antibiotics. The present case highlights the importance of performing targeted investigations to elucidate uncommon sources of acute pericarditis and tamponade in a young patient. The elevated ADA levels in pericardial fluid necessitate the exclusion of infective and mitotic causes, prompting further CT imaging. ADA is usually elevated in neutrophil-predominant effusions and is a more useful diagnostic tool in lymphocyte-predominant effusions, which are high in tuberculous pericarditis and neoplastic effusion.⁵ In the present case, other common aetiologies of tuberculosis and malignancy were excluded with negative cytology and acid-fast bacilli staining.

Echocardiogram is useful in delineating normal structural findings around pericardium from other pathology. This case highlights the importance of obtaining an initial wide-sector width during acquisition of echocardiographic images to evaluate for extra-cardiac structures, even in an acute setting. These extra-cardiac structures can be easily missed if the initial sector width is too narrow. Moreover, it is important to distinguish epicardial fat from other pathological extra-cardiac structures. Epicardial fat is commonly anterior to the heart, in the atrioventricular and interventricular grooves.

It is fairly immobile and has a granular reflection or texture within.⁶ As illustrated in present case, the mixed echogenic density around the cardiac apex had pericardial margin separating the ventricle from the structure, suggestive of extra-pericardial collection. If the diagnosis of the extra-pericardial structure is still uncertain, chest CT remains an adjunctive tool in clarifying normal from pathologic variants of cardiac and extra-cardiac structures given its high spatial resolution and tissue characterisation of fat.⁷

The seemingly uncomplicated case of acute pericarditis and tamponade led to a unique discovery of a primary gram-negative extra-pericardial abscess that precipitated this inflammatory response. Clinicians need to keep a high index of suspicion of extra-pericardial collections in a young patient presenting with an acute pericarditis and tamponade. More attention is needed to actively look for extra-pericardial collections on the index echocardiogram, particularly with a wide-sector width image acquisition. Urgent interventions are required to drain both the cardiac tamponade and extra-pericardial abscess.

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