Cardiac tamponade—still a difficult clinical diagnosis

Caoilfhionn Ni Leidhin, Suzanne Moran, Alastair MacLean

Abstract

A 51-year-old man with multiple risk factors for ischaemic heart disease attended the emergency department (ED) with sudden-onset chest pain, dizziness and breathlessness. He was tachycardic but had normal heart sounds and normal QRS complexes on ECG. Bedside ultrasound was performed, revealing a pericardial effusion. Emergent pericardiocentesis was performed with excellent outcome.

This case highlights the importance of early detection of cardiac tamponade as well as the role of bedside ultrasound in diagnosis and management of the condition.

Cardiac tamponade, a medical emergency, is a state of hemodynamic compromise resulting from compression of the heart by fluid trapped in the pericardial space.\(^1\)

It was first described by Dr Claude Beck in 1935 as the clinical diagnostic triad of decreasing arterial pressure, increasing venous pressure and a quiet heart.\(^2\)

The symptoms and signs of cardiac tamponade are often non-specific, making it a difficult clinical diagnosis.

Early detection is crucial, as untreated, the condition is rapidly and universally fatal.

Case report

A 51-year-old man with a history of hypertension, dyslipidaemia, atrial arrhythmias, previous strokes and a patent foramen ovale, closed in 2004, attended ED with sudden-onset, crushing chest “pressure”, dizziness and breathlessness.

On examination, he was diaphoretic, plethoric, centrally cyanosed, tachypnoeic and tachycardic with cool peripheries and a blood pressure (BP) of 95/60 mmHg in both arms. Cardiovascular, respiratory and abdominal examinations were otherwise unremarkable with normal heart sounds. ECG revealed sinus tachycardia with normal-sized QRS complexes and no changes suggestive of ischaemia/pericarditis.

The patient then became unstable and hypoxic with a BP of 60/48 mmHg; at this stage, distended neck veins were noted.

Bedside ultrasound was performed and revealed a moderate pericardial effusion with right ventricular collapse.
The on-call cardiologist was contacted and attended immediately. The patient was transferred to the Cardiac Catheterisation Laboratory (located on the same floor as the Emergency Department [ED]) where emergent pericardiocentesis was performed. 400 ml of bloody pericardial fluid was drained with immediate cardiovascular improvement. Post-procedural echocardiogram confirmed resolution of the pericardial effusion.

The patient’s post-procedural recovery was uneventful.

Subsequent investigations were normal. The patient had no prodromal illness. Blood tests revealed normal renal function, mildly elevated C-reactive protein with negative autoimmune/viral serology, protein electrophoresis and tumour markers. Pericardial fluid was negative for malignant cells, acid-fast bacilli and viral serology. A CT thorax, abdomen, pelvis showed no evidence of neoplastic disease, tuberculosis or superior vena cava obstruction.

**Discussion**

The symptoms and signs of cardiac tamponade are often non-specific. Generally-speaking, slow accumulation of pericardial fluid results in oedema, whereas rapid accumulation leads to shock with Beck’s described triad. Three features common to the majority of patients with tamponade have been identified: dyspnoea, tachycardia,
Pulsus paradoxus, elevated jugular venous pressure and cardiomegaly on chest radiograph.¹

Cardiac tamponade must be considered in any patient with haemodynamic instability as rapid diagnosis is crucial in averting poor outcome.

In ED, targeted ultrasound has become an invaluable tool in diagnosis and management of patients with suspected tamponade.⁴

Haemodynamic compromise and cardiac tamponade is an absolute indication for drainage. Following pericardiocentesis, extended pericardial drainage has been shown to lower pericardial effusion recurrence rates.⁵

The underlying cause of the pericardial effusion should be sought in order to optimise treatment and provide patient prognostication. Causes of painful acute cardiac tamponade include free wall rupture after myocardial infarction (MI), spontaneous or post-traumatic dissection and rupture of the ascending aorta. Less-acute causes of cardiac tamponade are likely medical—i.e. infection, metastatic cancer, connective tissue disease, inflammatory bowel disease, hypothyroidism, congestive heart failure, uraemia, radiation therapy, medication side effects.⁶

Up to one-third of patients with asymptomatic large chronic pericardial effusions develop unexpected cardiac tamponade.⁵

The most common cause of bloody pericardial effusion causing tamponade in USA community hospitals was found to be iatrogenic disease followed by malignancy, complications of MI and idiopathic disease.⁷

This case highlights the importance of considering cardiac tamponade in any patient attending ED with haemodynamic compromise. Bedside ultrasound has become an invaluable tool in diagnosis and management of these patients.

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Author information: Caoilfhionn Ni Leidhin; RMO, Tauranga Hospital, Tauranga; Suzanne Moran; SMO, Emergency Department, Tauranga Hospital, Tauranga; Alastair MacLean; SMO, Emergency Department, Tauranga Hospital, Tauranga

Correspondence: Dr Caoilfhionn Ni Leidhin, RMO, Tauranga Hospital, Cameron Road, Private Bag 12024, Tauranga 3143, New Zealand. Email: caoilfhionn.nileidhin@gmail.com

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