

Letter to the Editor

Beyond Beck's triad: A case report of cardiac tamponade in a “super-super” obese patient



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Dear Editor,

Cardiac tamponade is a medical emergency with various etiologies. Prompt recognition of the signs and symptoms of cardiac tamponade is critical but potentially full of challenge in clinical practice [1]. Here we report a case that required approaches more than classical Beck's triad due to extreme body habitus.

A 35-year-old African American woman, with significant past medical history of super obese, chronic ventilation dependent respiratory failure, CKD 5, present to medicine service initially for chest pain. Her chest pain was resolved shortly, but her hospital course was complicated for disposition issues. In her 3rd week in this hospitalization, patient began to experience episodes of tachycardia on exertion, associated with desaturation to 80s. Physical examination was limited as body habitus. Vital signs were recorded (T 98.2F, BP 83/56 mm Hg, HR 108, SaO₂ 85% on 10 L O₂, BMI 116, BW 294 kg). Fluid resuscitation was initiated, and vessel pressor was added as unstable blood pressure later on. Once arterial line was successfully placed, pulsus paradoxus was immediately appreciated as large decrease (25 mm Hg) in pulse wave amplitude during inspiration. Bedside ECHO was performed immediately, and identified a large circumferential pericardial effusion (up to 3.8 cm) (See Fig. 2). Emergency pericardiocentesis yielded 800 cm³ bloody fluid initially, and 400 cm³ light fluid overnight. Blood pressure immediately improved and the pressure requirement decreased significantly in 24 h. Fluid analysis reviewed bloody tap, negative for microbiology. Patient was on levothyroxine replacement therapy (TSH 4.63, free T4

1.05). Patient was started with hemodialysis thereafter. Repeated ECHO 1 week later showed no pericardial effusion was detected. Patient was medically ready to be discharged in 1 week later.

Cardiac tamponade is usually a result from increased pericardial pressure from accumulation of effusion in pericardium, which leads to impaired filling of left ventricle [2]. Signs of classic Beck's triad include arterial hypotension, jugular venous distension, and muffled heart sound. Although not all components would necessarily present on a single patient, Beck's triad has been demonstrated to be very sensitive (62–90%) in detecting cardiac tamponade especially in “surgical” tamponade [3]. Another important physical sign is pulsus paradoxus which is defined as abnormality in systolic blood pressure (>10 mm Hg) on inspiration [4]. A previous study suggested that absence of pulsus paradoxus had substantial value in lowering the likelihood of cardiac tamponade to 0.01–0.24 [5].

In our patient, neither JVD nor muffled heart sound is technically reliable to obtain given the body habitus (BMI 116). Arterial hypotension is always easily attributed by other clinical scenarios such as infection, dehydration etc. Fluid resuscitation is usually an initial measure to take. However, inability to improve after promptly fluid resuscitation urges the need of closer monitoring of intra-arterial blood pressure, which importantly triggered the suspicion of cardiac tamponade (Fig. 1). Finally, bedside echocardiography is absolutely indicated in this scenario. Early diastolic right ventricle is a very specific finding indicating tamponade (72–100%), along with identification of pericardial effusion [6]. Experienced individuals are able to detect pericardial effusions on bedside ultrasound

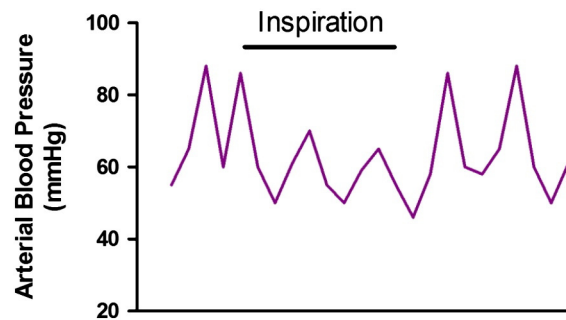


Fig. 1. Representative arterial blood monitor. (Reproduced from real time record data).

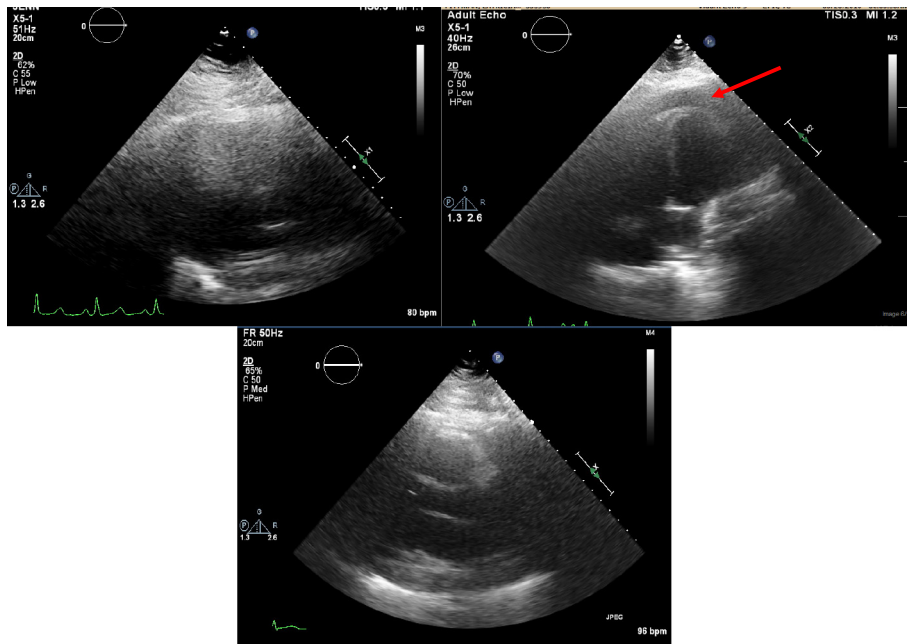


Fig. 2. Serials of echocardiography. Left, 5 months prior to this episode, no pericardial effusion. Right, large pericardial effusion detected from bedside ECHO. Middle lower, Pericardial effusion s/p pericardiocentesis.

with a sensitivity of 96%, specificity of 98%, and overall accuracy of 97.5% [7].

Emergency drainage by pericardiocentesis is clearly the first choice of management of tamponade in acute phase. In an earlier study from Spain, over 23 of 27 tamponade patients were successfully relieved without undergoing more invasive measures such as percutaneous pericardial window [8].

The long term management relied upon on potential etiologies. The most common type of fluid samples in patients who had pericardiocentesis for relieving tamponade is bloody. Atar et al. reviewed 96 cases in 1990s, and found that malignancy, acute myocardial infarction, uremic, were the most common non-iatrogenic causes, rather than the “common” hemorrhagic tuberculous pericardial effusion in 1960s [9]. Neither signs of cardiac malignancy nor acute myocardial infarction were appreciated through multiple attempts of echocardiography in current case. Other causes such as hypothyroidism or electrolyte abnormality were ruled out as well. Further optimal responses to hemodialysis also concur with the putative diagnosis of uremic pericardial effusion with tamponade.

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