Cardiac Tamponade as the Presenting Feature for Undiagnosed Malignant Metastatic Disease

Sidhanta Gurung1, Abhishek Maiti1, and Sujith V. Cherian2*

1Department of Internal Medicine, The University of Texas Health Sciences Center at Houston, USA
2Department of Pulmonary, University of Texas Health Science Center at Houston, USA

CLINICAL IMAGE

A 63-year-old man with a 38 pack-year smoking history presented with four weeks of worsening cough and shortness of breath. He was initially treated for multifocal pneumonia and chronic obstructive pulmonary disease exacerbation. During the hospital stay, the patient became acutely hypotensive. Physical exam revealed a temperature of 97.8 degrees Fahrenheit, heart rate of 92 beats per minute, blood pressure 78/68, respiratory rate of 29 breaths per minute, and an oxygen saturation of 89% on room air. Physical examination revealed jugular venous distention and muffled heart sounds. An electrocardiogram (EKG) (Figure 1) and transthoracic echocardiogram (TTE) were obtained (Figure 2). Based on clinical presentation and imaging findings, the patient was diagnosed with cardiac tamponade.

Cardiac tamponade is caused by accumulation of pericardial fluid that equalizes pressures between the pericardial sac and cardiac chambers leading to diastolic filling dysfunction with subsequent diminished cardiac output and resulting hemodynamic instability.

Depending upon the acuity of presentation, patients may present with various symptoms including dyspnea, chest pressure, and syncope. Physical examination findings include hypotension, jugular venous distention, and muffled heart sounds, together called Beck's triad [1]. Patients can have pulsus paradoxus and Kussmaul sign with a prominent "x" descent and an absent "y" descent of jugular venous pulse. Physicians trained in ultrasonography are able to diagnose cardiac tamponade with bedside ultrasound with a sensitivity and specificity of 96% and
98%, respectively [2].

Around 28% of symptomatic pericardial effusions are secondary to malignancy [3], most commonly lung cancer. In most cases, echocardiography-guided pericardiocentesis is preferred over pericardial window as there is some evidence that pericardiocentesis has significantly lower complication, 30-day mortality, and overall mortality rates [3].

Cardiac tamponade EKG findings include sinus tachycardia, low QRS voltages (less than 0.5mV in limb leads and 1.0mV in precordial leads), and electrical alternans due to an oscillating heart in pericardial fluid. EKGs can aid in the diagnosis of cardiac tamponade but should not be used as the sole method for diagnosis. In cases of malignant pericardial effusions, combinations of EKG abnormalities should not be used as a screening tool for cardiac tamponade as they have a low negative predictive value [4].

In this case, official TTE showed a large pericardial effusion with early diastolic right ventricular compression and EKG showed sinus rhythm with low QRS voltage in the presence of electrical alternans. The patient was taken for urgent pericardial window. Pericardial fluid cytology was positive for metastatic adenocarcinoma of unknown origin.

CONFLICT OF INTEREST

The authors whose names are listed certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers’ bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

REFERENCES