Oncologic Mechanical Emergencies

Umar A. Khan, MD, Carl B. Shanholtz, MD, Michael T. McCurdy, MD*

KEYWORDS

• Pericardial tamponade • Superior vena cava syndrome • Brain metastasis
• Metastatic spinal cord compression • Hyperviscosity syndrome

KEY POINTS

- Diagnosing an oncologic emergency requires a high degree of suspicion in patients with a known or suspected malignancy.
- Echocardiography is the modality of choice to diagnose pericardial tamponade, and prompt pericardiocentesis can reverse the hemodynamic effects of tamponade.
- Radiation and systemic corticosteroids are the treatments of choice for SVC syndrome, however establishing tissue diagnosis is recommended prior to starting the treatment.
- Prompt imaging can establish the diagnosis of brain metastasis as well as malignant spinal cord compression. Systemic corticosteroids and radiation therapy remain the mainstay in the emergency department setting.
- Hyperviscosity is frequently seen in paraproteinemias and plasmapheresis can prevent potentially life threatening complications.

Oncologic emergencies represent a wide spectrum of disorders either resulting from the progression of a known malignancy or presenting as the initial manifestation of a previously undiagnosed malignancy (**Fig. 1**). Patients might not show characteristic signs and symptoms, so a high degree of suspicion for malignancy-related complications is crucial, especially in patients with known malignancy. With the prevalence of cancer on the increase, patients presenting with cancer-related emergencies as their initial manifestations of malignancy are also expected to increase.[1] Because these are life-threatening conditions, prompt recognition can markedly reduce morbidity and mortality in the short-term and affect prognosis in the long-term. In addition, if the patient's clinical condition permits, prognosis and life expectancy should be discussed and the goals of care should be explored during initial evaluation. The conditions discussed in this article are often early manifestations of disease; therefore, the treatment provided in the emergency department (ED) plays a significant role in the management of these patients.

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Division of Pulmonary and Critical Care, University of Maryland School of Medicine, 110 South Paca Street, 2nd Floor, Baltimore, MD 21201, USA
* Corresponding author.
E-mail address: drmccurdy@gmail.com

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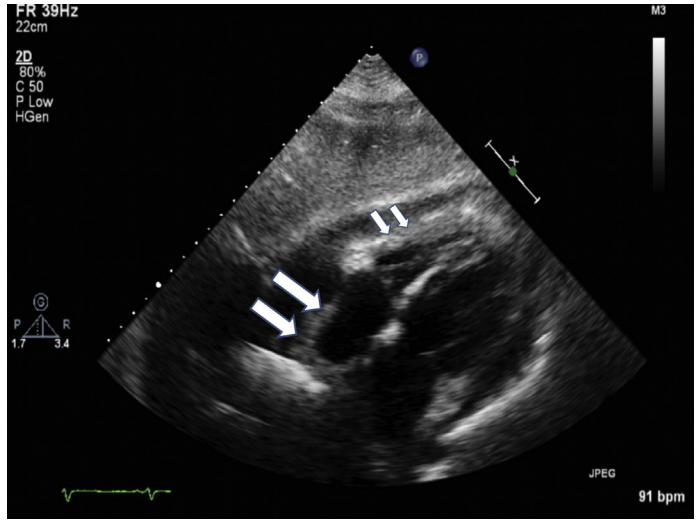

Fig. 1. Two-dimensional echocardiographic image of pericardial tamponade showing diastolic right atrial (*large arrows*) and right ventricular indentation (*small arrows*) in the subcostal window.

PERICARDIAL TAMPONADE

Twenty percent to 34% of patients who have cancer have pericardial involvement.[2,3] The most common primary malignancy involving the pericardium is lung cancer, followed by breast and esophageal cancers.[4] Although malignant pericardial effusion is the most common manifestation of pericardial involvement, the most serious complication is pericardial tamponade. Pericardial tamponade is an increase in intrapericardial pressure that impairs intracardiac filling and cardiac output, necessitating emergent intervention.

Pathophysiology

Normally, the pericardial space contains up to 50 mL of fluid. However, cancerous cells can invade this space via direct invasion or through blood or lymphatic metastasis, leading to substantial malignant fluid accumulation. An acute increase of only 200 mL of fluid may cause a steep increase in intrapericardial pressure, impairment of cardiac filling, and hemodynamic compromise.[5] However, patients with chronic pericardial disease can have stress relaxation, whereby, over the course of weeks or months, the pericardium may accommodate up to 2 L of fluid, without a significant increase in intrapericardial pressure.[5]

Signs and Symptoms

The presenting complaints associated with malignant pericardial effusions can be nonspecific, ranging from exertional dyspnea to tachycardia and chest pain. The classic Beck triad[6] of muffled heart sounds, hypotension, and increased jugular venous pressure is seen in one-third of patients with rapidly accumulating effusions[7] but is less common in patients with chronic effusions. Pulsus paradoxus (**Box 1**), characterized by a decrease in systolic blood pressure of more than 10 mm Hg with inspiration, is observed in up to 77% of patients with pericardial tamponade.[6]