Non-cardiac causes of cardiac tamponade

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DESCRIPTION

A 60-year-old man with diffused large B-cell lymphoma undergoing chemotherapy presented with dyspnoea. He had a borderline hypotensive blood pressure of 106/75 mm Hg and a heart rate around 105 bpm. Chest X-ray and CT of the chest showed large right pleural effusion (figures 1 and 2). A transthoracic echocardiogram demonstrated no pericardial fluid, however there was invagination of the right atrial free wall with tamponade physiology caused by the right pleural effusion (figures 3 and 4; videos 1 and 2). Therapeutic thoracentesis with the removal of 1.9 L of transudative fluid was performed after which the patient had complete resolution of the tamponade physiology (figures 5 and 6; videos 3 and 4) and

Figure 1 Chest roentgenogram showing obliteration of the right costophrenic angle consistent with a right pleural effusion.

Figure 2 CT of the chest demonstrating large right pleural effusion displacing the heart to the left side.

Figure 3 Transthoracic echocardiogram, the four-chamber view, demonstrating invagination of the right atrial free wall with tamponade physiology.

dyspnoea with an improvement of borderline hypotension and tachycardia.

Cardiac tamponade encompasses a spectrum that ranges from mild to severe cardiac compression. Tamponade progression depends on the intrapericardial pressure, intracavitary pressure and chamber wall compliance. The right atrium is the first to collapse followed by the left atrium and the right ventricular free wall, respectively.¹ Diastolic collapse of the right atrium in end diastole, especially when it persists for more than one-third of the cardiac cycle, is highly sensitive and specific for cardiac tamponade.²

Using canine models exposed to pericardial and pleural fluid infusion, the rise in pericardial pressure secondary to pleural effusion was found to be better tolerated than the rise to the same level when caused by a pericardial effusion only.¹ Coexistence of pericardial and pleural effusions can result in a challenging therapeutic decision when the echocardiogram shows findings suggestive of cardiac tamponade.

Figure 4 Transthoracic echocardiogram, the subcostal view demonstrating invagination of the right atrial free wall with tamponade physiology.

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Video 1 Transthoracic echocardiogram, four-chamber view, demonstrating invagination of the right atrial free wall with tamponade physiology.

Figure 6 Transthoracic echocardiogram, the subcostal view demonstrating resolution of tamponade physiology after thoracentesis.

Video 2 Transthoracic echocardiogram, subcostal view demonstrating invagination of the right atrial free wall with tamponade physiology.

Video 3 Transthoracic echocardiogram, four-chamber view demonstrating resolution of tamponade physiology after thoracentesis.

Figure 5 Transthoracic echocardiogram, the four-chamber view demonstrating resolution of tamponade physiology after thoracentesis.

Video 4 Transthoracic echocardiogram, subcostal view demonstrating resolution of tamponade physiology after thoracentesis.

Learning points

- ▶ Cardiac tamponade is caused by compression of cardiac chambers due to increased pericardial pressure.
- ▶ Large pleural effusion may cause an increased intrapericardial pressure sufficiently to cause echocardiographic findings of cardiac tamponade. In this situation, the appropriate therapeutic approach is the drainage of the pleural effusion.

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