CASE REPORT

An unusual presentation of cardiac tamponade associated with Epstein-Barr virus infection

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SUMMARY

We present a case of an 80-year-old woman who presented with a dry cough, shortness of breath and general malaise. She had presented 5 days previously with a sore throat, feeling feverish and with non-specific symptoms. Her background included paroxysmal atrial fibrillation and hypertension. She was initially thought to have decompensated heart failure secondary to atrial fibrillation and was initiated on diuretic therapy. However, a transthoracic echocardiogram performed revealed collapse of the right ventricle and a swinging heart, suggestive of cardiac tamponade. The patient underwent therapeutic pericardiocentesis where 700 mL of exudative, blood-stained fluid was drained. Subsequent testing of the pericardial fluid revealed the presence of Epstein-Barr virus DNA. Serial follow-up transthoracic echocardiograms revealed resolution of the pericardial effusion and the patient remained asymptomatic.

BACKGROUND

Epstein-Barr virus (EBV) is a rare but recognised cause of pericarditis. It can progress to pericardial effusion and tamponade, which may require emergency therapeutic pericardiocentesis. Unfortunately, pericardial disease can present with non-specific symptoms, which may hinder or delay diagnosis. In our case, the presence of medical comorbidities and hence more plausible diagnoses meant a delay in identifying the true cause of the patient's illness.

CASE PRESENTATION

An 80-year-old Caucasian woman initially presented to our hospital after reporting a very painful sore throat, decreased appetite, increasing shortness of breath and feeling feverish for the past 4 days. She had a medical history of paroxysmal atrial fibrillation, hypertension and hypercholesterolaemia. She had had a transthoracic echocardiogram 6 months earlier, which was reported as structurally normal. Her regular medications included furosemide, bendroflumethiazide, warfarin and simvastatin. She had seen her general practitioner a few days prior, who prescribed her penicillin V and withheld her bendroflumethiazide due to hypotension. During her admission she remained hypotensive and her furosemide was also stopped. Her working diagnosis was a viral upper respiratory tract infection and she was discharged the next day.

She re-presented to hospital 5 days postdischarge with increasing dry cough, shortness of breath, reduced exercise tolerance and general malaise for the past 3 days. On examination, she was in fast

atrial fibrillation (AF) with a heart rate of 122. Her blood pressure was 116/59 mm Hg. She had bibasal crackles in her lower chest and also mild pitting oedema to the mid calves. She also had a raised jugular venous pressure. She was thought to have decompensated heart failure due to diuretics being withheld. She was therefore started on intravenous diuretics and bisoprolol for rate control.

INVESTIGATIONS

Initial blood tests revealed a mildly raised neutrophil and monocyte count, as well as elevated C reactive protein (42 mg/L), but were otherwise unremarkable. The patient's INR was 5.2 but no obvious bleeding was seen. Her admission chest radiograph revealed bilateral pleural effusions and background features of chronic airways limitation. The heart was reported as being significantly enlarged. Her admission ECG showed AF, although repeat ECG 2 days later showed sinus rhythm with low voltage QRS complexes in the anterior leads. As part of her heart failure work up, she underwent a transthoracic echocardiogram, which showed a large pericardial effusion measuring 3.0 cm (figure 1). There was right ventricular collapse and a mildly dilated inferior vena cava. There were echo findings of a swinging heart, which was suggestive of cardiac tamponade (video 1).

DIFFERENTIAL DIAGNOSIS

- Decompensated heart failure due to withholding of diuretics
- Cardiac tamponade of unknown cause

TREATMENT

The patient was transferred as an emergency to a tertiary cardiac centre where therapeutic

Figure 1 Parasternal long-axis view demonstrating pericardial effusion.

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Video 1 Apical 4-chamber view with evidence of a swinging heart and right ventricular collapse.

pericardiocentesis was performed; 700 mL of blood-stained fluid was subsequently drained from the patient.

OUTCOME AND FOLLOW-UP

Laboratory analysis of the pericardial fluid showed protein of 40 g/L, consistent with an exudate. Several virology PCR tests were performed; enterovirus, herpes simplex type 1 and 2, varicella zoster and cytomegalovirus (CMV) were negative. However, EBV DNA was positive. Fluid cytology revealed paucicellular blood-stained fluid with few mesothelial cells and mixed inflammatory cells. No malignant cells were seen.

The patient was re-admitted to our hospital for further investigation of the cause of her tamponade. Repeat transthoracic echocardiogram 5 days later revealed a small 1 cm rim of pericardial fluid but no evidence of tamponade. The patient also underwent a CT scan of her chest, abdomen and pelvis, which did not demonstrate any obvious malignancy. The differential of lymphoma was also discussed, although she was not anaemic and her lactate dehydrogenase level was also normal (338 iu/L). She remained clinically well postpericardiocentesis and was discharged a week postreadmission.

Repeat transthoracic echocardiogram 2 months later revealed resolution of the pericardial effusion, and the patient remained asymptomatic.

DISCUSSION

EBV is a known cause of acute pericarditis, which is classified as dry, fibrinous or effusive.^{1 2} Viral causes have an incidence of 30–50%, with autoimmune diseases such as systemic lupus erythematosis, rheumatoid arthritis and malignancy being other common causes.¹ Other viral causes include Coxsackie, Mumps, CMV and HIV.¹ It is thought that the virus spreads to the pericardial tissue and releases toxic substances, which then cause inflammation and effusion.¹ Tamponade occurs when there is external cardiac compression due to accumulation of effusion fluid leading to increased intrapericardial pressure, though this tends to occur over days to weeks in non-surgical causes.¹ Diagnosis is usually by transthoracic echocardiogram with the demonstration of collapse of cardiac chambers in diastole and the appearance of a swinging heart.¹

There is one case of EBV-associated pericardial tamponade reported, which was in an 18-year-old immunocompetent girl.³ Pulmonary embolism was initially suspected and a pleural effusion was only discovered during CT scanning. EBV PCR assay was positive in the serum. Furthermore, there is a German case

report of a 73-year-old woman who presented with dyspnoea, and was found to have a large pericardial effusion. EBV PCR assay was positive in the effusion fluid.⁴ Finally, there is a further case reported of a 39-year-old healthy man who developed EBV-associated pericarditis and pericardial effusion, but pericardiocentesis was not performed.⁵ EBV-specific antibodies were found in the serum.

In our case, the absence of typical signs and symptoms, as well as the presence of more common and, arguably, more plausible, explanations meant that there was a delay in reaching the final diagnosis. The patient complained of a fever, shortness of breath and a sore throat, which had resolved by her second admission. She did not report positional chest pain, which would be more suggestive of pericardial disease. Moreover, hypotension could have been explained by the patient's use of diuretics, while the raised jugular venous pressure would also be expected in heart failure. The presence of AF meant also that heart failure due to arrhythmia became more likely. There was also absence of a pericardial friction rub and discernible muffled heart sounds.

This case demonstrates the need to take a careful history from the start and to consider all the patient's symptoms as a whole. It would appear that her initial symptoms of a sore throat may have been suggestive of active EBV infection. Although EBV-associated pericardial effusion and tamponade may be easily overlooked, especially in an older person with other comorbidities, transthoracic echocardiograms are diagnostic and are readily available in most hospitals.

Patient's perspective

It was a frightening experience being ill and not knowing why. The results of the echocardiogram were made known to me immediately and I was swiftly transferred to the tertiary centre. The good care provided to me by both hospitals was comforting and reassuring. I am recovering well and am grateful to the medical staff for the professionalism and dedication in finding out the root of the problem.

Learning points

- ▶ Epstein-Barr virus (EBV) is a rare cause of pericardial disease and can cause pericardial effusion and tamponade.
- ▶ Typical symptoms are non-specific, and include chest pain and shortness of breath.
- ▶ Clinical diagnosis of tamponade can be made by Beck's Triad, although transthoracic echocardiogram findings of a swinging heart with diastolic collapse of cardiac chambers is diagnostic.
- ▶ Serum and pericardial fluid EBV PCR can point to active EBV infection.
- ▶ The non-specific symptoms and signs of EBV-associated pericardial disease may mean a delay in diagnosis, as there may be other plausible explanations for the patient's symptoms.

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