Unusual association of diseases/symptoms

What could be the cause of late syncope after pacemaker implantation?

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Summary

A 21-year-old man who had suffered an episode of complete heart block 2 months earlier and thus undergone pacemaker implantation presented with syncope. Echocardiography showed cardiac tamponade and raised the suspicion of lead penetration. The effusion was drained. Multi-sliced CT scan confirmed that the right aspect of the pacemaker wire was extracardiac, causing the cardiac tamponade.

BACKGROUND

Our literature review showed that for all the reports on the complications of pacemakers (PMs), there was a paucity of data on cardiac tamponade after PM implantation. Cardiac tamponade can occur secondary to the perforation of the heart chambers during PM lead insertion and manipulation. This perforation occurs early and is generally believed to be benign and self-limiting. Moreover, rarely does this complication give rise to tamponade and haemodynamic disturbance. It is only advisable that physicians be aware of such possible complications and be prepared to better manage and treat them.

CASE PRESENTATION

A 21-year-old man presented with a history of syncope. Our evaluation showed complete heart block, for which he received a permanent dual chamber PM. Echocardiography was performed the following day, and the patient was discharged in good condition. One month later, he returned to our clinic for routine PM evaluation and the PM test showed normal function. Two months after PM implantation, the patient was brought to the emergency room with syncope and haemodynamic disturbance. On admission, his blood pressure was 80/60 mm Hg. The patient received rapid intravenous fluid resuscitation, which increased the systemic

Figure 1 Transthoracic echocardiography revealed massive pericardial effusion with right ventricular and right atrial collapse.

Figure 2 CT scan, volume rendered image depicting the extracardiac pace wire.

blood pressure to 120/80 mm Hg. The ECG demonstrated normal pace rhythm. Transthoracic echocardiography revealed massive pericardial effusion with right ventricular and right atrial collapse (figure 1). The patient was urgently transferred to the operating room, where 1200 millilitre fluid was drained. The next day, the patient underwent transthoracic echocardiography, which showed no effusion but the right ventricular lead seemed to be abnormal. Cardiac CT scan was thereafter performed and revealed an abnormal lead tip position in the anterior chest wall and perforated right ventricular myocardium (figure 2). Pace analysis showed acceptable pacing and sensing. The patient was discharged and followed up. He appears well at long-term follow-up, with no other device-related problems.

DIFFERENTIAL DIAGNOSIS

The first cause of syncope in patients with chronic atrioventricular (AV) block after the implantation of a permanent PM may be the dysfunction of the stimulation system. Other possibilities are the so-called 'PM syndrome',¹ arrhythmias and neurological problems. After these causes of syncope are discounted, symptoms may be secondary to reflexive type disturbances or autonomic changes²; be that as it may, it is vitally important that we consider late tamponade.

OUTCOME AND FOLLOW-UP

The patient appears to be in good physical condition at long-term follow-up, with no other device-related problems.

DISCUSSION

PM lead perforation is a rare complication with an incidence rate of less than 1%. Late lead perforation is defined as the perforation of a device lead through the myocardium more than 1 month after implantation.³

Cardiac tamponade and sudden cardiac death are rare and usually associated with acute lead perforation.⁴ Perforation may be in consequence of a combination of the lead diameter and muscle contraction associated with each heart beat.⁴ Late lead perforation has been described in several case reports. Late lead perforation may represent from asymptomatic acute perforation to true late perforation. Common symptoms consist of chest pain, dyspnoea and diaphragmatic pacing.³ But lead perforation has been reported as a late tamponade.⁵

All clinicians should keep in mind tamponade due to late lead perforation when a patient with a PM presents with haemodynamic disturbance. Chest CT is very valuable to establish the diagnosis in those patients.

Learning points

- ▶ Syncope or presyncope (early or late) in patients with complete AV block and an implanted PM require careful clinical history taking, complete physical examination, echocardiography, PM review, Holter study and tilt table test. Establishing a correct diagnosis allows selection of adequate treatment for the patient.
- ▶ One of the main causes of cardiac tamponade nowadays is iatrogenic.
- ▶ Although rare, cardiac tamponade caused by myocardial perforation during pacing lead insertion usually occurs a short time after the procedure.
- ▶ Cardiac tamponade as a late complication of PM placement is exceedingly rare.

Competing interests None.

Patient consent Obtained.

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