Hemopericardium caused by a mobile retained epicardial pacing wire after ventricular septal defect repair
A case report
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Abstract

Background: Epicardial pacing wires (EPWs) are commonly employed for diagnosis and treatment of arrhythmia in the acute phase after cardiac surgery. Although rare, retained EPWs may cause mild-to-catastrophic complications. The present case demonstrates hemopericardium caused by a mobile retained EPW.

Methods: A 49-year-old woman presented to our emergency department with clinical signs of impending cardiac tamponade. She had undergone ventricular septal defect repair 7 years before this admission. An initial computed tomography (CT) scan revealed hemopericardium with suspicion of a possible intracardiac lesion. Review of the first and second CT scans, however, revealed a mobile retained EPW penetrating the pericardium in the first scan, which had moved out of the pericardium in the second scan.

Results: Because cardiac injury by the EPW was suspected, the patient was transferred to another medical center for further treatment.

Conclusion: According to our experience with this case, diagnosis may be incorrect if CT is unable to obtain decisive images of the mobile EPW at the correct time. Multiplanar reconstruction and volume rendering can increase diagnostic accuracy. In conclusion, if hemopericardium is present without clear etiology in a patient with a retained EPW, a nearby mobile EPW may be the cause.

Abbreviations: CT = computed tomography, EPW = epicardial pacing wire, MPR = multiplanar reconstruction, VR = volume rendering;

Keywords: cardiac surgery, complication, computed tomography, congenital heart disease, epicardial pacing wire, hemopericardium

1. Introduction

Epicardial pacing wires (EPWs) are routinely used during cardiac surgery and usually removed before discharge. Although rare, retained EPWs may cause mild-to-catastrophic complications. Here, we report a case of hemopericardium caused by a mobile retained EPW, which was initially missed.

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2. Case report

The case report was approved by the Chang Gung Medical Foundation Institutional Review Board, Taipei, Taiwan. Although written informed consent was not obtained, the patient’s information was anonymized and de-identified. A 49-year-old woman reported symptoms of acute chest pain, progressive dizziness, and syncope at her home in August 2009. She was sent to our emergency department with clinical signs of impending cardiac tamponade. Chest radiography revealed cardiomegaly and blunting of bilateral lateral costophrenic angles (Fig. 1). She had undergone ventricular septal defect repair approximately 7 years before this admission.

Chest computed tomography (CT) performed using a 64-slice CT scanner (Somatom Sensation 64; Siemens Health Care, Forchheim, Germany) revealed hemopericardium with impending cardiac tamponade (Fig. 2). A pigtail catheter was inserted into the pericardial space under sonographic guidance, and approximately 300 mL blood was drained. Purulent pericarditis was initially suspected, but laboratory findings did not support this diagnosis.

Under suspicion of a possible intracardiac lesion, cardiac CT (retrospective electrocardiographic gating, 120kV, 900mA, pitch=0.2, and no dose modulation) with a split-bolus contrast medium injection was performed using the same CT scanner 3 days after admission. Review of the first and second CT scans with multiplanar reconstruction (MPR) and volume rendering (VR) revealed a piece of retained EPW penetrating the anterior...
inferior aspect of the pericardium, close to the right ventricle (approximately 0.9 cm of the EPW was inside the pericardial space) (Fig. 3A–D). The lesion was missed on the first CT scan because only axial images had been assessed. We also noted that the EPW was mobile (open arrowheads in Fig. 3C and G) and had moved outward in the second scan (Fig. 3E–H).

Because cardiac injury by the EPW was suspected, the patient was transferred to another medical center for further treatment.

Surgeons there decided on observation rather than surgical removal. The patient has had no recurrent symptoms.

3. Discussion

EPWs are commonly employed for diagnosis and treatment of arrhythmia in the acute phase after cardiac surgery and are routinely removed before discharge.\(^1\) Although they are removed by constant gentle traction, they can get caught in the epicardium or along their course through the chest. In such situations, the EPW should be pulled as far as possible and cut close to the skin to allow the cut end to retract into the tissue.\(^2\)

Complications of a retained EPW include migration, infection, coronary artery compression, arrhythmia, graft injury, myocardial infarction, retroaortic abscess, aortic bleeding,
hemopericardium, pneumopericardium, diaphragmatic hernia, bronchocutaneous fistula, or even colon perforation; migration is the most common complication.[3–10]

EPW-related hemopericardium and cardiac tamponade are usually associated with EPW removal. A retained EPW causing hemopericardium is relatively uncommon and may be caused by perforation or graft injury.[8,11–14]

Retained EPWs are less obvious than sternal wires because of their thickness and position. In our case, the retained EPW was barely visible on initial chest radiography because of unsatisfactory exposure condition. Moreover, because the EPW was perpendicular to axial CT images, we initially missed the diagnosis. However, review of the first and second CT scans with MPR and VR clearly revealed the relative position of the EPW and allowed for accurate diagnosis.

To the best of our knowledge, there is no literature describing kinetic movement of an EPW. In this case, the EPW was mobile and had penetrated the pericardium, causing hemopericardium on the first CT scan. However, the EPW had moved out of the pericardium on the second CT scan. Diagnosis may be incorrect if CT is unable to obtain decisive images at the correct time. In fact, clinicians usually do not repeat CT in a short period of time. Therefore, if there is hemopericardium of unknown cause or repeated hemopericardium, physicians should remain alert for any nearby EPWs. In the present case, although there were no surgical specimens to correlate with the CT findings, the images were useful for definitive diagnosis.

4. Conclusion

CT with MPR and VR is useful for accurate diagnosis in patients with EPWs. Furthermore, if hemopericardium is present without clear etiology in a patient with a retained EPW, a nearby mobile EPW may be the cause.

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