Retroaortic abscess: an unusual complication of a retained epicardial pacing wire

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Abstract

Infectious complications related to retained temporary epicardial pacing wires are rare. We report a case of a focal retroaortic abscess in association with retained pacing wires that became manifest 3 years after surgery for tricuspid valve endocarditis.

Keywords: Epicardial pacing wire • Infection • Complication

INTRODUCTION

Temporary epicardial pacing wires are commonly placed at the completion of cardiac surgery procedures. The overall morbidity related to epicardial pacing wires is low, however, complications related to their insertion, removal and retention have been reported. Here, we report an unusual case of a retroaortic abscess resulting from retained epicardial pacing wires.

CASE REPORT

A 55-year-old male with a history of intravenous drug abuse presented with focal erythema and purulent drainage from a midline sternotomy scar. Three years prior, he had undergone tricuspid valve replacement (TVR) for methicillin-resistant Staphylococcus aureus (MRSA) endocarditis at another institution. The operation was notable for significant coagulopathy that necessitated mediastinal packing and delayed sternal closure on postoperative day 2. Temporary epicardial pacing wires were placed on the right atrial appendage and left atrial dome at the time of TVR; these were clipped at the skin once normal coagulation was postoperatively maintained. A right-sided hemithorax, which resulted in respiratory compromise, required evacuation via a posterior thoracotomy on postoperative day 9. The hospital course was protracted due to these issues, as well as acute renal failure and ventilator dependence requiring bridgement of his wound and removal of the epicardial pacing wires via a subxiphoid approach with fluoroscopic guidance. A single pacing wire was retrieved with this approach, and it grew MRSA in culture. The second pacing wire could not be localized with a deeper course in the mediastinum. Computed tomography (CT) of the chest revealed a 3.3 × 4.0 cm thick-walled rim-enhancing mediastinal fluid collection posterior to the ascending aorta and anterior to the right main pulmonary artery, centered around the coiled terminal portion of one of the epicardial pacing wires (Figs 1 and 2; Supplementary Video 1). Limited inflammatory changes were noted in the anterior chest wall, contiguous with a soft tissue tract that the wires traversed. The retained wires terminated anterior to the liver. Transthoracic echocardiography revealed normal function of his tricuspid valve bioprosthesis without evidence of vegetation.

Initially, the patient declined aggressive open debridement, and he was therefore taken to the operating room for local debridement of his wound and removal of the epicardial pacing wires via a subxiphoid approach with fluoroscopic guidance. A single pacing wire was retrieved with this approach, and it grew MRSA in culture. The second pacing wire could not be localized with this method, though the follow-up CT scan confirmed its presence in the posterior mediastinal fluid collection.

With evidence that the deep mediastinal collection and residual wire were likely infected, the patient agreed to return to the operating room for surgical removal and open drainage. The approach taken was a right anterior thoracotomy through the third intercostal space. The pericardium was longitudinally opened toward the superior vena cava. A dense phlegmon with associated tissue oedema was encountered. A long needle was inserted into the phlegmon posterior to the ascending aorta, and ∼20 ml of purulent fluid was aspirated. Further dissection through the wall of the phlegmon unroofed the abscess cavity, presenting to our institution for the first time with drainage and erythema in the same location. He denied any intravenous drug abuse since his original valve operation. He was afebrile and had a white blood cell count of 10.8 K/µl. Blood cultures were negative.

The chest radiograph demonstrated two retained epicardial pacing wires, one with a superficial retrosternal course and one with a deeper course in the mediastinum. Computed tomography (CT) of the chest revealed a 3.3 × 4.0 cm thick-walled rim-enhancing mediastinal fluid collection posterior to the ascending aorta and anterior to the right main pulmonary artery, centered around the coiled terminal portion of one of the epicardial pacing wires (Figs 1 and 2; Supplementary Video 1). Limited inflammatory changes were noted in the anterior chest wall, contiguous with a soft tissue tract that the wires traversed. The retained wires terminated anterior to the liver. Transthoracic echocardiography revealed normal function of his tricuspid valve bioprosthesis without evidence of vegetation.

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and the retained pacing wire was identified and removed. Drains were left in the abscess cavity and pleural space.

Culture of the deep mediastinal fluid grew MRSA sensitive to vancomycin and linezolid. Drains were removed when the output was scant. The patient was discharged home after completing 2 weeks of intravenous vancomycin therapy. An additional 4 weeks of oral linezolid therapy was completed as an outpatient. He remains asymptomatic without wound complications 10 months later.

DISCUSSION

Temporary epicardial pacing wires are commonly placed during cardiac surgery operations. In most cases, the pacing wires are never utilized, and they are removed prior to discharge from the hospital. In some instances, the wires cannot be easily removed, and they are clipped at the skin to avoid significant injury to the atrium or ventricle. The threshold for clipping a pacing wire may be lowered by other factors, including thrombocytopenia or level of anticoagulation. While clipping pacing wires eliminates the short-term risk of bleeding related to removal of the wire, it leaves behind a foreign body in the mediastinum. In most cases, this appears to be without significant short-term risk; however, the long-term effects of this practice are relatively unknown.

Reported complications related to retained pacing wires include valvular endocarditis [1], ventricular tachycardia associated with wire migration [2] and migration into the lung [3]. In addition, the risk of infection may be increased when temporary pacing wires are retained. One study reported that 13% of temporary pacing wires removed between 5 and 10 days postoperatively were colonized with bacterial pathogens [4]. The clinical significance of this finding is unclear, however, none of the patients with positive cultures developed deep mediastinal infection. In the present case, the retained temporary pacing wires likely contributed to the late development of the posterior mediastinal abscess. Patients with acute infectious endocarditis may be at higher risk of late infectious complications when foreign bodies, including temporary epicardial pacing wires, are retained. Although rare, a few other cases of mediastinal abscess in association with retained epicardial pacing wires have been reported. In 1 case, an epicardial pacing wire was found inside an anterior mediastinal abscess cavity 12 years after coronary artery bypass surgery [5].

Figure 1: Axial sections of contrast-enhanced CT scan. (a) The coiled epicardial pacing wire is demonstrated within a thick-walled retroaortic mediastinal fluid collection (arrow). (b) Focal inflammatory changes are noted in the soft tissue anterior to the sternum. In addition, a retrosternal epicardial pacing wire with associated soft tissue changes is present (arrow).

Figure 2: Coronal reconstruction of non-contrast CT scan demonstrates retained pacing wire in a discrete abscess cavity. A = abscess cavity.

Supplementary Video 1: Animated coronal reconstructions of non-contrast CT scan. Discrete abscess cavity containing the retained epicardial pacing wire is noted in a retroaortic position. TVR = tricuspid valve replacement.

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The mainstay of treatment for mediastinal abscesses is effective drainage, removal of any foreign body and appropriate antibiotic coverage. In the case presented, the right anterior thoracotomy approach was favoured over a reoperative sternotomy. This approach facilitated access to the retained pacing wire and the retroaortic abscess while avoiding the potential morbidity of a reoperative sternotomy in the face of an infected mediastinal space.

SUPPLEMENTARY MATERIAL

Supplementary material is available at ICVTS online.

REFERENCES