




# Rare Intra-Aortic Migration of Temporary Epicardial Pacing Wire

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## Abstract

Temporary epicardial pacing wires are used routinely in the postoperative period to prevent brady-arrhythmias and maintain hemodynamic condition. Their safety and efficacy have been widely accepted with a low incidence of complications. Complications associated with temporary epicardial pacing wires may occur during removal or may be related to retained wires. Migration is one of the well-established but rare complications of retained epicardial pacing wire. Though migrations to various organs have been well documented in the literature, there are only few reports on intra-aortic migration of pacing wires in the postoperative period. Further, it is important for radiologists to know and identify these epicardial pacing wires as they may be associated with complications like superadded infection, migration to surrounding or distant areas, and injury to the heart and vessels.

## Keywords

- ▶ temporary epicardial pacing wires
- ▶ intra-aortic migration
- ▶ pacing wire
- ▶ CT angiography

## Introduction

Temporary epicardial pacing wires (TEPWs) are widely used for postoperative care after major cardiac surgeries. Mostly, they are removed; however, in some cases, they are clipped and left to retract into the skin. These retained pacing wires may be associated with local site or distant complications. We, hereby, report a rare case of fragmentation and intra-aortic migration of TEPW.

## Case

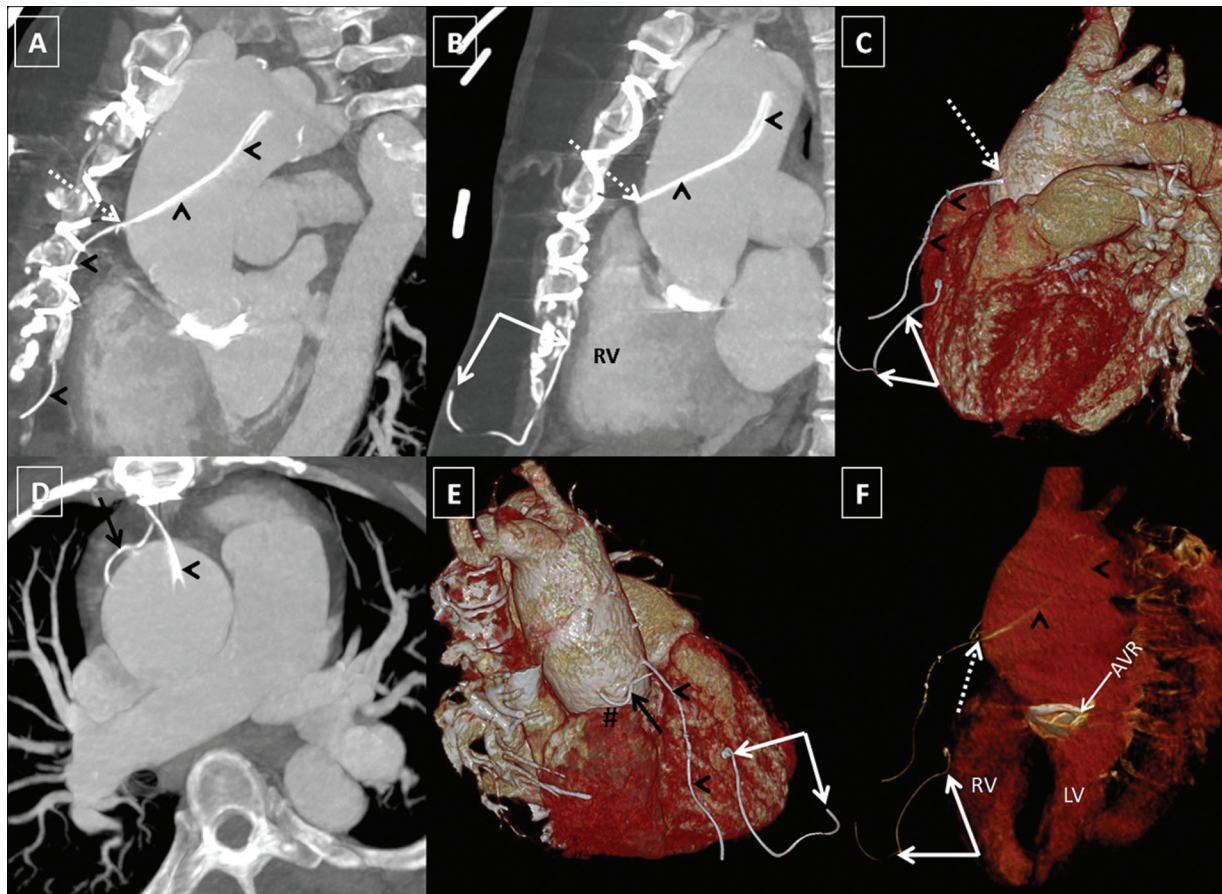
A 57-year-old female patient was referred to our hospital with outside echocardiography revealing the presence of a hyperechoic linear structure in the ascending aorta. She had undergone aortic valve replacement 4 years back. The patient had no complaints of chest pain or fever, however complained of vague chest heaviness. Erythrocyte sedimentation

rate (12 mm/h) and C-reactive protein (0.6 mg/dL) levels were within the normal range. ECG-gated CT angiography was performed which showed the metallic aortic prosthetic valve in situ. No surrounding collection or pseudoaneurysm was seen. No aortic dissection was seen. There was a hyperdense linear metallic structure (mean attenuation approximately 800 HU) seen in the anterior mediastinal fat in the right parasternal location which was seen piercing the anterior wall of the proximal ascending aorta with its distal tip extending up to the distal portion of the aortic arch. No surrounding thrombus was seen along it. No evidence of any active or contained leak was seen at the site of its entry into the aorta. A similar smaller fragment was seen abutting the right atrial appendage and the adjacent ascending aorta at this level. Another linear structure was also seen along the lower anterior chest wall with its external tip flush with the skin and internally reaching anterior to the right ventricle

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**Fig. 1** CT angiography images (A-F) showing intra-aortic migration of one of the epicardial pacing wires (arrowheads) which pierced the proximal ascending aorta (white dashed arrow) and is seen extending distally into the aortic arch. Adjacent small wire fragment (black arrow) is also seen lying close to the right atrial appendage (#). Another epicardial wire (grouped arrows) is also seen along lower anterior chest wall with its external tip flushed with the skin, extending internally anterior to the right ventricle (RV). LV-left ventricle. AVR represents the prosthetic aortic valve.

(→ Fig. 1). Conclusion was made of TEPWs with the fragmentation of one of the wires with intra-aortic migration. Retrospectively, on eliciting the detailed prior history for aortic valve replacement done 4 years back, it was revealed that two TEPWs were placed during intraoperative period and were clipped flush with the skin. Since then, the patient had no symptoms of stroke or endocarditis. The patient was explained about the risks of retained TEPWs and was given the option of surgical retrieval; however, patient opted for conservative management with close clinical follow-up for the time being. Subsequently, the patient was managed conservatively with oral anticoagulant, antiplatelet therapy, and close periodic follow-up. He was advised follow-up, initially after 3 months with clinical evaluation, lateral chest radiograph, and echocardiography.

## Discussion

TEPWs are the atrial and ventricular pacing leads that are inserted commonly during cardiothoracic surgeries to manage arrhythmias in the postoperative period.<sup>1,2</sup> Routinely, these wires are removed before discharging the patient. But, occasionally, these wires are not removed and clipped close to the skin level, if any resistance is found on its removal as

catastrophic complications can occur on its forced removal like coronary artery bypass graft injuries, cardiac arrhythmias, and pericardial or cardiac wall injuries leading to cardiac tamponade.<sup>3,4</sup>

Retained TEPWs may act as a nidus for infection and may cause endocarditis or even stroke.<sup>5-7</sup> The migration of TEPWs is an unusual but documented complication and poses management challenges. The literature describes the migration of pacing wires to the right heart or main pulmonary artery and less commonly to the left heart or aorta with reports to even distant sites such as jaw, right carotid artery, bronchus, bronchial artery, pleural space, lung parenchyma, peritoneal cavity, transcolonic, and transepidermal migration.<sup>8-12</sup> Our case is one of the few case reports described in the literature as yet in which an epicardial pacing wire has pierced and migrated into the aorta.

As these temporary epicardial pacing wires are used commonly in various cardiac surgeries and can be seen on postoperative CT scans, radiologists should be familiar with their appearance and the complications associated with them. Moreover, they may cause stroke, endocarditis, or ventricular tachycardia and may mimic the dissection flap on echocardiography, if migrated inside the aorta. These TEPWs should ideally be removed prior to patient discharge;

however, if due to any reason, the retention of such wires is needed, it should be well documented and explained to the patient with close periodic follow-up.

#### Funding

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#### Conflict of Interest

None declared.

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