Intraaortic Migration of an Epicardial Pacing Wire: Percutaneous Extraction

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Infrequent but serious complications have been described in association with temporary epicardial pacing wires. We describe the case of an intraaortic migration of an infected retained atrial temporary epicardial pacing wire and the transfemoral percutaneous interventional approach for its extraction.


A trial or ventricular temporary epicardial pacing wires (TEPW) are frequently inserted in cardiac surgery at the conclusion of the procedure. When possible, pacing wires are removed with gentle transcutaneous retraction, generally within the first postoperative week. Their use is generally safe and simple, but infrequent and rarely catastrophic complications have been reported. More important and serious acute complications occurring during wire removal include hemorrhage and tamponade from atrial and ventricular lacerations and injuries to saphenous vein grafts. The retained TEPW may cause severe long-term complications. In this regard, investigation and monitoring of documented abandoned TEPW allow early diagnosis and management.

A 42-year-old woman, already operated on in childhood for aortic coarctation through a left posterolateral thoracotomy, was referred to our hospital for surgical treatment of a severe bicuspid aortic valve stenosis and ascending aortic aneurysm. The patient underwent aortic valve replacement and supracoronary graft replacement with a 19-mm mechanical prosthesis (St. Jude Medical, St. Paul, MN) and a Dacron prosthesis (Gelweave; Vascutek Terumo, Renfrewshire, Scotland). A bipolar TEPW was implanted as usual on the medial aspect of the base of the right atrial appendage. The postoperative course was uneventful. On the fourth postoperative day, because of the difficulty encountered in removing the TEPW, it was cut at skin level and left in situ.

The patient was discharged home on the seventh postoperative day. She eventually recovered well but was referred again to our institution after 9 months because of recurrent fever, bacteremia, and positive blood cultures. An analysis of the recent clinical history revealed that, starting from 3 weeks after the operation, the patient had had recurrent hospitalizations for fever and that every attempt to stop antibiotics had led to fever and bacteremia recurrence.

Transeosophageal echocardiography excluded prosthetic valve dysfunction, vegetation, or annular excavations; however, a floating wirelike structure was detected in the aortic arch. A computed tomography scan clearly identified the wirelike structure as a TEPW migrated into the aortic arch (Fig 1). Because of these findings, a TEPW infection was suspected, and after consultation with interventional cardiologists, an attempt for percutaneous extraction of the wire was planned.

The procedure was performed through the right femoral artery; a gooseneck catheter (Amplatz GooseNeck Snare; EV3 Inc, Plymouth, MN) was advanced into the aortic lumen close to the left subclavian artery origin; the wire was captured and gently pulled out. At direct inspection, the foreign body showed to be a 20-cm long segment of the bipolar TEPW implanted on the right atrium at the previous operation. The postprocedural echocardiograms excluded pericardial effusion or other complications. The computed tomography scan excluded late periprosthetic bleeding. At 4-month follow-up, the patient is doing well and is free of fever recurrences.

Comment

Complications associated with TEPWs are classified in two categories: early complications, occurring during the insertion or during the use or during the removal of TEPW; and late complications due mostly to retained TEPWs [1]. During the last 3 decades, the range of complications reported varied from minor complications, such as localized cutaneous abscesses or fistula formation, to major complications like distant migration of the TEPW with the development of infective endocarditis [2].

Fig 1. (A) Sagittal computed tomography scan image shows a wirelike structure that migrated into the aortic arch to the origin of the left subclavian artery. The tip and two thirds of the proximal wire are found inside the aortic lumen; the initially subcutaneous part of the wire flush is still in the mediastinum outside the aorta. (B) The transverse view demonstrates the intravascular position of the wire in the ascending aorta (arrow).
This is the first report of a percutaneous transluminal removal of a bipolar atrial TEPW “partially” migrated into the aortic lumen through the aortic wall. Juchem and colleagues [3], 4 years ago, described a similar case of intraaortic migration of a retained atrial TEPW; however, because the wire was found to be in a totally intraluminal position, its way of access remained unclear. The investigators, considering unlikely a direct perforation of the aortic root by the wire, could only speculate about the possible migration of the pacing wire through a direct perforation of the roof of the left atrium through the sinus transversus.

Our findings suggest that direct erosion of aortic wall by the tip of the wire is possible and can lead to migration of TEPW into the lumen. The computed tomography scan clearly showed, in fact, that although the tip and the proximal two thirds of wire were located inside the aortic lumen, the remainder was still in the mediastinum outside the aorta (Fig 2). A percutaneous endovascular approach for the extraction of retained TEPW is possible and must be weighed against the risks of a reoperation, especially if presence of adherence can be anticipated by a long timeframe between the initial operation and the endovascular attempt. This potential complication has to be suspected and excluded. All TEPWs should be completely removed whenever possible.

References