Short Communication

Pocket Infection Complicating Inadvertent Transarterial Permanent Pacing. Successful Percutaneous Explantation

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Summary: This report describes a patient admitted for the treatment of a pocket infection occurring 5 months after a dual chamber pacemaker implantation. The ventricular lead had been inadvertently placed into the left ventricle through the arterial system. After careful examination using transesophageal echocardiography and left heart angiogram, successful percutaneous extraction was performed without complication.

Key words: cardiac pacing, transarterial implantation, left ventricle malposition, percutaneous explantation

Introduction

Inadvertent transarterial insertion of a permanent pacing lead has been described only rarely.^{1–5} Therapeutic options in patients with chronic left ventricular (LV) pacing consist of anticoagulation and open heart surgery for lead removal. Percutaneous lead removal is reported in a patient with a transarterial implantation associated with a pocket infection.

Case Report

An 82-year-old woman was admitted for the treatment of a pocket infection occurring 5 months after a dual-chamber pacemaker implant. Symptomatic high-degree atrioventricular block was the indication for the pacemaker. The implanting

physician reported that a 2-lead insertion had been performed percutaneously through a presumed left subclavian vein. The atrial lead was removed 7 days after surgery because of a pacing dysfunction, and the pacemaker was reprogrammed to the VVI mode. Local infection with impending ulceration of the left subclavicular pocket was observed, but there were no general complications or neurological symptoms. The 12-lead electrocardiogram showed ventricular capture with a right bundle-branch block pattern and a superior frontal axis. Anterior-posterior and lateral chest x-rays showed an anterior and medial path for the ventricular lead in the mediastinum and a posterior electrode tip position. Severe kyphoscoliosis was present. Transesophageal echocardiography revealed a lead crossing the aortic valve with the distal electrode positioned at the left ventricle apex. No adherent thrombi on the lead were detected. Moderate aortic regurgitation and normal LV function with mild mitral insufficiency were noted during transthoracic echocardiography. Venography demonstrated a lead course of an unusually cephalic orientation that was entirely outside of the venous system. Transfemoral cineangiography excluded significant valvular aortic regurgitation or perforation (Fig. 1). The left ventriculogram showed a lead tip at the LV apex with no myocardial perforation or thrombus formation. The transaortic positioning and the mild aortic regurgitation in association with the pocket infection argued for the entire removal of the pacing system. Antibiotics and heparinotherapy were instituted for 6 days prior to the procedure. Under local anesthesia, a sterile incision was made over the subcutaneous path of the lead, remote from the infected pocket. The lead was cut, a locking stylet was advanced through the conductor core lumen, and its locking filament was engaged near the tip of the lead. The lead was disengaged from the myocardium with a firm traction on the locking stylet and completely removed without significant arterial bleeding. The proximal part of the lead and the pulse generator were explanted and a drain was set up. Stable intrinsic rhythm was present and temporary pacemaker support during explantation was not required. A single transvenous lead and a VDD pacemaker were subsequently implanted on the opposite side. Following explantation, echocardiography showed unchanged moderate aortic and mitral regurgitation. No other complications were detected at 1-year follow-up.

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FIG. 1 Contrast cineangiography in right anterior projection showing the pacing lead crossing the aortic valve and entering the left ventricle. A transfemoral pig tail catheter is positioned in the ascending aorta.

Discussion

Transarterial lead insertion should be recognized intraoperatively. This error is usually detected on the fluoroscopic views showing a direct medial and posterior lead path. A typically different pathway would result from the insertion through a persistent left superior vena cava: after emerging from the coronary sinus, before entering the right ventricle, the lead describes a large retrograde atrial loop or a sharp angle.⁶ Severe kyphoscoliosis observed in this case report could have been a cause of the lead malplacement and path misinterpretation. Several methods of ensuring a proper lead insertion are available. The lead may be advanced into the pulmonary artery before its placement in the right ventricle. Both a frontal and a lateral view should be obtained during fluo-

roscopy. When the electrode is in the right ventricle, it has a lateral and forward direction. Electrocardiographic recordings from the electrode tip are characterized by a deep S wave. The surface electrocardiogram is usually characterized by a left bundle-branch block pattern, and left ventricle stimulation is characterized by a right bundle-branch block pattern. Anticoagulant or antiplatelet therapy has been the only treatment proposed in some cases after late recognition of asymptomatic LV pacing. In our case of transarterial insertion, because of the developing pocket infection in the vicinity of the left heart chambers, lead extraction was necessary. Because of the risk of neurological complications, open heart surgery is the recommended technique for removal of a chronic endocardial LV lead.³⁻⁵ In our aged patient, heparinotherapy followed by percutaneous extraction allowed lead removal with minimal morbidity. Before the start of a percutaneous extraction procedure, careful examination using transesophageal echocardiography and left heart angiogram is necessary to exclude adherent thrombus formation and aortic or myocardial perforation.

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