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Left Ventricular Lead Implanted in the Right Ventricle Through a Thrombotic Subclavian Vein

Skevos Sideris, MD, Konstantinos Gatzoulis, MD, Christina Melexopoulou, MD, Ioannis Skiadas, MD, George Trandalis, MD, Ilias Sotiropoulos, MD, Dimitrios Limperiadis, MD, Christodoulos Stefanadis, MD, Ioannis Kallikazaros, MD

Hippokration General Hospital of Athens, Athens, Greece

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ABSTRACT

An 86-year-old patient was referred to our hospital because of pacemaker extrusion. The attempt to advance a right ventricular lead through the left subclavian vein failed due to vein thrombosis. Finally, an over-the-wire left ventricular lead was stabilized at the apex of the right ventricle successfully, through the thrombotic subclavian vein.

CASE REPORT

We present the case of an 86-year-old man who underwent uncomplicated implantation of an endocardial VDDR pacemaker in the right thoracic wall for the management of complete heart block 6 years earlier. Two years ago the patient underwent pulse generator replacement due to battery depletion. The procedure was complicated with pacemaker pocket infection, finally resulting in pulse generator extrusion through the skin. At that time, the patient was referred to our hospital, with the pulse generator hanging from the electrode, although working normally (Fig. 1). A temporary pacemaker was inserted through the right femoral vein; an attempt to go through the left internal jugular vein failed. Following that, we removed the old right-sided pacing lead in the electrophysiology laboratory using the Vascoextor Viper system, which is a lock stylet system. Cultures from the skin, lead and pacemaker revealed S. epidermidis which was methicilin-resistant. For this reason the patient received vancomycin with rifampicin for six weeks and gentamicin for two weeks.

The implantation of an epicardial lead was abandoned, since the cardiac surgeon considered the procedure of high risk due to a previous history of coronary bypass that had been complicated with sternum osteomyelitis ten years earlier. Additionally the subxiphoid alternative was considered as an unsafe approach due to the development of fibrosis. Furthermore, it is well known that the epicardial screw-in leads could progressively increase the pacing thresholds after a few months developing pacemaker exit block. Thus, an attempt was made for percutaneous endocardial implantation from the left subclavian vein.

Our attempt to advance a right ventricular lead through the left subclavian vein failed due to vein thrombosis, evident on venous angiography (Fig. 2). However, we

Correspondence to:
Skevos Sideris, MD
4 Evrou street, 115 28, Athens, Greece
Tel.: +306974730110
Fax: +302107754676
e-mail: skevos1@otenet.gr

FIGURE 1. Pacemaker extrusion.

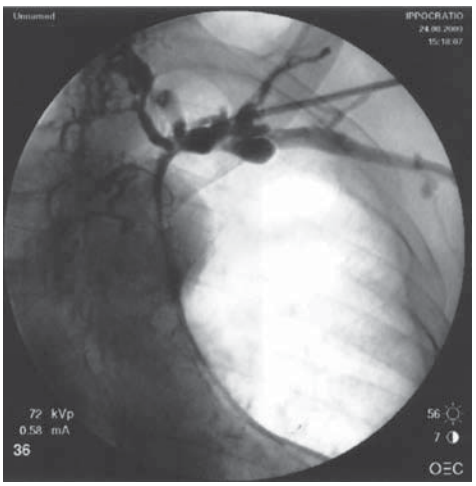

FIGURE 2. Angiography revealed thrombosis of the left subclavian vein.

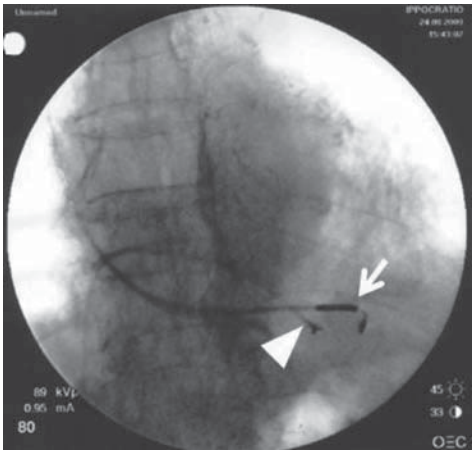

FIGURE 3. Successful left ventricular lead implantation at the apex of the right ventricle (arrow); the temporary pacing lead is marked with the arrow head.

finally achieved to advance an angioplasty wire through the thrombotic left subclavian vein without dilation of the vein. It was impossible to put a 6F introducer over the wire. However, we were able to successfully advance over the wire a left ventricular lead (Attain Bipolar OTW 4194-88 cm IS-1 BI Medtronic). In order to stabilize the lead, we passed and left a ball-tipped stylet within the lumen of the pacing lead (Fig. 3). The strategy to leave the stylet in the lead constitutes an unconventional approach; however, we have occasionally used it for leads in the coronary sinus. The lead was connected to a VVIR generator which was implanted in a new pocket in the left thoracic wall. During the 8-month follow up, the patient remains asymptomatic with good pacemaker function and without new signs of infection.

DISCUSSION

Late infections complicating pacemaker implantation require removal of the entire pacing system and prolonged antibiotic therapy, followed by re-implantation of a new pacing system from the contralateral side. Pacing lead extraction is a tedious and risky but highly successful procedure, most commonly performed with use of percutaneous techniques; less frequently, open heart surgery is required, especially in the presence of large vegetations in the endocardial pacing leads[1-3].

Occasionally, even if the infected system is successfully extracted in the electrophysiology laboratory through percutaneous techniques, there are cases where alternative routes of new transvenous implantation are limited requiring epicardial pacing.[4] In our case the previous complicated open heart surgery as well as the left superior vena cava thrombosis limited our options for permanent pacing in this pacermaker-dependent patient. However the combination of introducing an angioplasty wire trough the thrombosed vein along with the passage of an over-the-wire left ventricular lead into the right ventricle provided an effective and permanent solution to our complicated patient.

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