

Dual-chamber pacemaker implantation with left ventricular pacing in a patient with a right ventricular assist device

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This is a case of a patient requiring pacemaker support after right ventricular assist device (RVAD) implantation. Due to complete heart block after right ventricular infarction, a pacemaker with an atrial lead and a ventricular lead into the coronary sinus was implanted. Although RVAD patients requiring pacemakers lack the typical RV implantation site for the ventricular lead, the coronary sinus can be used alternatively.

Case

A 63-year-old patient was admitted to our department with an acute dissection of the right coronary artery following a percutaneous intervention. An emergency bypass surgery could not prevent right heart failure and extracorporeal membrane oxygenation implantation was subsequently performed. Because the right ventricular (RV) function did not improve over the following days, a permanent device was necessary. A HeartWare® HVAD ventricular assist device was implanted into the diaphragmatic RV for right heart support. Haemodynamics improved and the patient stabilized. Within the next 14 days, the patient presented episodes of intermittent complete atrioventricular block without escape rhythm. Conduction disorders are commonly seen in patients with myocardial infarction.¹ A dual-chamber pacemaker implantation became necessary and was performed endovascularly. The atrial lead was positioned at the free wall of the right atrium. However, the standard ventricular lead site in the RV cannot be used in patients with continuous-flow assist devices in the RV, because of the risk that a guide wire or lead could be suctioned into the rotor and instantly destroy the pump. The ventricular lead was positioned into the coronary sinus instead. Using a coronary sinus catheter, a Medtronic Attain StarFix® OTW² lead was implanted into a posterolateral vein (Figure 1). Both leads were connected to a standard dual-chamber pacemaker device with an IS-1 header. Postoperatively, the patient had a regular heart rate with intermitted pacemaker stimulation.

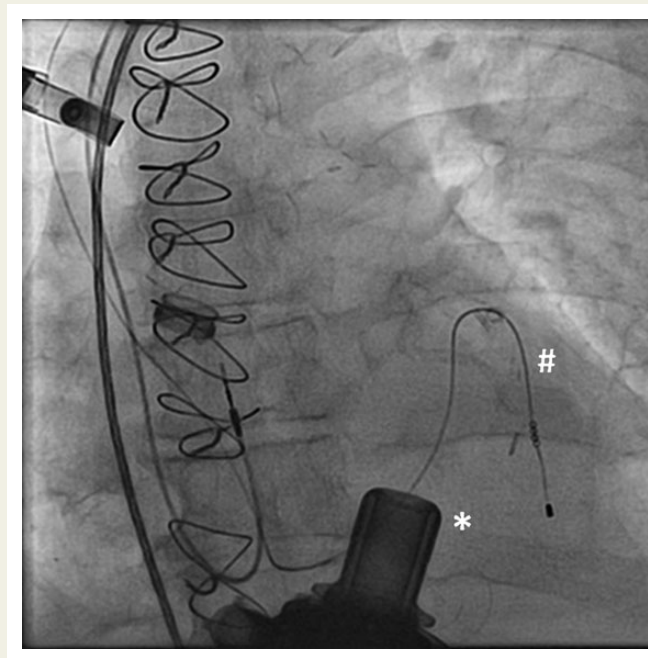


Figure 1 Pacemaker lead positions in a patient on RVAD support. The HeartWare® HVAD ventricular assist device was inserted into the diaphragmatic RV surface (*). The atrial pacemaker lead was positioned at the right atrium's free wall and a Medtronic Attain StarFix® OTW LV lead was introduced into a posterolateral cardiac vein (#).

Left ventricular pacing is a well-established standard therapy for cardiac resynchronization in patients with asynchronous contractions of the ventricles.³ For patients with RV assist device (RVAD), the ostium of the coronary sinus is distant enough to the turbulence that is caused by the working assist device's inflow cannula, and the lead can be actively fixed within the vein to ensure additional safety. Certainly, the implantation of a lead into the coronary sinus instead of the RV apex, septum, or RV outflow tract is more demanding, but it reduces the risk of fatal entrapment within the cannula. The coronary sinus is a valuable alternative for pacemaker implantation in these patients.

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Conflict of interest: none declared.

References

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