Leadless Pacemaker and Subcutaneous Implantable Cardioverter Defibrillator Combination in a Hemodialysis Patient

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Figure. (A) Chest X-ray of the subcutaneous implantable cardioverter defibrillator (S-ICD) and Micra leadless cardiac pacemaker (LCP) system (Medtronic, Minneapolis, MN, USA). (Left) Anterior view. (Right) Lateral view. (B) 3-D volume-rendered computed tomography showing the LCP (yellow arrow) and the S-ICD (red arrow). (C) S-ICD electrogram in the primary vector showing induced ventricular tachycardia (ventricular fibrillation [VF]), which is appropriately detected and treated with a 65-J shock. Immediately after the appropriate shock, paced (P) beats by the LCP (VVI, 70 p.p.m.) are sensed appropriately. The VVI mode was used during VF testing because the patient should be tested in the same manner as in the clinical setting. The VVI mode on its own, however, may be insufficient to determine whether appropriate shock therapy has been delivered. S, spontaneous beat.
The leadless cardiac pacemaker (LCP) and subcutaneous implantable cardioverter defibrillator (S-ICD) are both evolving technologies that do not require transvenous leads and are suitable for patients with limited venous access (LVA). A 70-year-old man with a history of coronary artery disease (left ventricular ejection fraction, 50%) had symptomatic sinus bradycardia. He had been on hemodialysis and had an anterior chest skin erosion due to irradiation therapy for esophageal carcinoma. LCP implantation was considered a better option than a conventional transvenous pacing system because of the skin erosion and LVA. The LCP was successfully implanted with favorable electrical parameters, but, unfortunately, he had symptomatic ventricular tachycardia after the LCP implantation. Because no major issues were noted on screening test for S-ICD, an S-ICD was implanted in addition to the LCP while ensuring that the shock therapy worked properly (Figure). At 1-month follow-up, the performance of the devices was satisfactory without any interactions (device programming: LCP VVI, 40 p.p.m.; S-ICD detection rate, 200< beats/min).

When these 2 technologies are used together, it is important to ensure that there is no interaction between the LCP and S-ICD during delivery of bradycardia or shock therapy.1,3

Disclosures
The authors declare no conflicts of interest.

References