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CLINICAL VIGNETTE

Leadless pacemaker and subcutaneous implantable cardioverter-defibrillator therapy: the first use of a novel treatment option in Poland

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A 69-year-old patient with moderate ischaemic left ventricular systolic dysfunction (ejection fraction of 45%) and a history of recurrent ventricular tachycardia (VT) underwent subcutaneous implantable cardioverter-defibrillator (S-ICD) implantation (Model 1010 SQ-RX; Boston Scientific, Marlborough, MA, USA) in 2015 due to previous device infections and extractions of ICD from both sides. The procedure was conducted under general anaesthesia, with the can placed in a left lateral position over the fifth and sixth intercostal space. The defibrillation lead was tunnelled towards the xiphoid process and moved cranially along the left parasternal line. Successful defibrillation threshold testing using a 65-J shock was performed at the time of implantation without complications. The patient had continuous atrial fibrillation and there were no specific indications for pacing at the time of S-ICD implantation. After a few weeks, many episodes of non-sustained and sustained VT were present and some of them required S-ICD treatment (Fig. 1) and intense antiarrhythmic therapy. In addition, atrial fibrillation with complete atrio-ventricular block and a wide QRS (140 ms) escape rhythm of 40 to 45 bpm was observed. Accordingly, as the last treatment option, a leadless pacemaker Micra Transcatheter Pacing System (Micra TPS; Medtronic, Minneapolis, MN, USA) was implanted via the right femoral vein (Fig. 2). Optimal position of the device on the right ventricular septum was achieved. The measured parameters included: R wave 10.7 mV, impedance 590 Ω, and threshold 0.38 V at 0.24 ms. The lower rate limit was programmed to 60 bpm with a rate-adaptive pacing. At the time of the implantation, no interactions between Micra TPS and S-ICD were observed (oversensing or double counting), even with the combination of high output of pacing energy and most sensitive setting of the S-ICD in all three configurations (primary, secondary, alternate). Because the patient gave no consent for inducing VT, another defibrillation threshold testing was not performed during Micra TPS implantation (Fig. 2). However, according to available data, the device would successfully withstand a full output shock from the S-ICD. Finally, we programmed a low threshold for Micra TPS to reduce the risk of false detection by the S-ICD. Tests were performed before discharge and subsequently at each three-month follow-up visit. There were no adverse interactions observed. At 13-month follow-up, interrogation of the Micra TPS revealed 83.4% ventricular pacing and the patient remained well (New York Heart Association class I/II), without any shocks. The combined treatment with S-ICD, Micra TPS, and intensive antiarrhythmic pharmacotherapy was clinically successful in long-term follow-up.

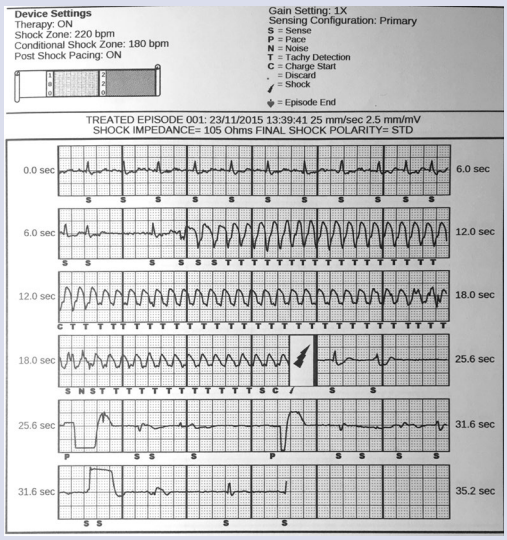

Figure 1. A full subcutaneous implantable cardioverter-defibrillator report from the treated episode of ventricular tachycardia

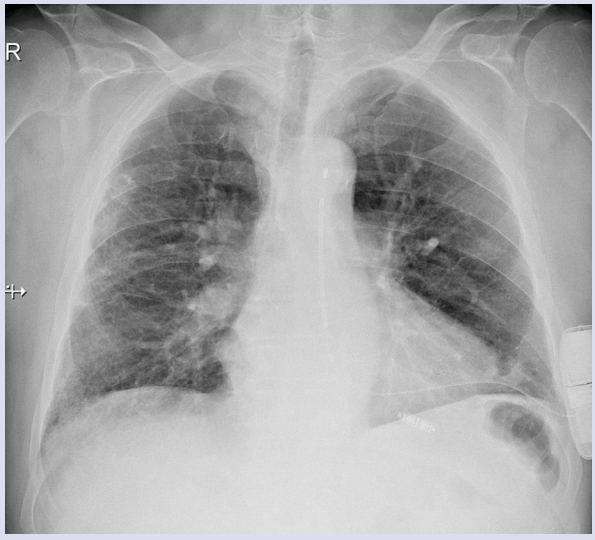

Figure 2. Chest radiograph with anteroposterior view of the leadless pacemaker and subcutaneous implantable cardioverter defibrillator systems

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Conflict of interest: *K. Kaczmarek, J.K. Wranicz P. Ptaszyński — medical consultants for Boston Scientific and Medtronic*