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Periprocedural malfunction of a cardiac resynchronization therapy defibrillator during dual-energy ablation of ventricular tachycardia storm in ischemic cardiomyopathy

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Introduction: Catheter ablation is an established treatment for refractory scar-related ventricular tachycardia (VT) storm. Interactions between combined radiofrequency (RF) and pulsed field ablation (PFA) and cardiac implantable electronic devices remain incompletely characterized.[1]

Case report: 68-year-old man with ischemic cardiomyopathy (left ventricular ejection fraction 25%), prior myocardial infarction and a CRT-D (Biotronik Intica Neo 5 HF-T) for secondary prevention was admitted in April 2026 with palpitations and dizziness. VT substrate ablation of an inferior/inferoseptal scar in December 2025 had been complicated by hemorrhagic pericardial effusion requiring drainage. Initial CRT-D interrogation showed normal battery and lead function with 98% biventricular pacing. During a sustained VT episode (cycle length 380 ms), anti-tachycardia pacing (ATP) failed, and a total of six 40-J shocks were delivered. Urgent VT ablation was performed using 3D mapping (Affera, Medtronic, USA) and a lattice-tip dual-energy catheter (Sphere 9). RF lesions targeted the inferior and inferoseptal scar border; PFA was delivered at the inferoapical exit and inferior mid-segment isthmus. VT terminated after further combined applications and was non-inducible on aggressive programmed stimulation. During the RF applications on the septal side of the scar, VF was induced, and the patient was successfully defibrillated. During the PF applications in the inferoseptal region from both the left and right ventricles, the patient developed complete AV block and was paced in an asynchronous mode. After the procedure, device interrogation demonstrated simultaneous out-of-range pacing impedance (>3 kΩ) in the atrial, right ventricular and left ventricular leads, accompanied by signal noise, despite preserved battery capacity (86%) and normal pacing thresholds. Factory reset was unsuccessful. Because the patient was pacing-dependent, the CRT-D generator was replaced four days later, retaining all leads. Lead parameters were normal at interrogation, and defibrillation testing successfully terminated induced ventricular fibrillation with a 40-J shock. Manufacturer analysis detected no intrinsic generator defect. An energy-related interaction was suspected on temporal grounds, but the mechanism remained unproven.

Conclusion: Interaction of a lattice-tip dual-energy ablation catheter with certain ICDs has been described. Pre- and post-ablation device interrogation is essential, and avoiding PF applications near the ICD leads should be considered since such applications can lead to ICD dysfunction. Simultaneous lead-parameter abnormalities may necessitate generator replacement despite normal manufacturer findings.

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LITERATURE

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