DEVICE THERAPY

UNIQUE IMAGE REVIEW

Subtotal Separation of Implantable Cardioverter-Defibrillator Header from the Casing Mimicking An Atrial Lead Fracture

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A 76-year-old man received a dual-chamber implantable cardioverter-defibrillator (ICD), implanted subpectorally for recurrent sustained ventricular tachycardia in the setting of ischemic cardiomyopathy and tachy–brady syndrome. Seven years later, the ICD reached elective replacement indicator and was replaced with a Boston Scientific Teligen model. A routine ICD interrogation 18 months later revealed intermittent loss of pacing capture at maximum output in conjunction with an elevated lead impedance (>2,000 ohms (Figure 1). P-wave sensing was generally stable and there was no evidence of noise or artifact on the intracardiac recordings with or without pectoral manipulations. All other parameters were within normal limits including stable R-wave sensing, ventricular pacing threshold (0.7 V @ 0.5 ms) and pacing and shock impedance. As a result, a fracture in the atrial lead conductor was suspected. In view of the patient’s need for atrial pacing, he was referred for a lead replacement. However, at the time of the procedure, a preliminary inspection of the ICD header revealed subtotal separation from the casing. Furthermore, examination of the atrial lead showed normal sensing, pacing threshold, and impedance as confirmed through the analyzer. Thus, the ICD generator was replaced instead, which rectified the abnormal atrial lead findings.

In December 2009, Boston Scientific Corporation issued an advisory reporting that mechanical stress associated with subpectoral implantation of Teligen ICDs or Cognis cardiac resynchronization therapy-defibrillators (CRT-Ds) may weaken the bond between the header and the casing. Since then, several reports have demonstrated that this rare complication can present with fluctuations or abnormal increases in multiple, ventricular, or shock lead impedances usually associated with non-physiological noise on the intracardiac electrograms. However, as illustrated by this case, this unusual complication may also simply manifest with lone atrial lead abnormalities such as elevated pacing threshold and impedance mimicking a lead fracture.

References


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**Figure 1:** *Right panels,* illustrate the ICD intracardiac recordings showing sinus rhythm free of noise or artifact with relatively stable P-wave sensing but elevated atrial lead impedance >2,000 ohms. However, the ventricular lead parameters are within normal limits including stable R-wave sensing as well as pacing and shock impedance. *Left panels,* illustrate images obtained intraoperatively showing subtotal separation of the ICD header from the can. Intraoperative evaluation of the atrial lead through the analyzer revealed normal lead sensing, pacing threshold, and impedance.