Atrial floating dipole sensing performances in implantable cardioverter defibrillator and cardiac resynchronization therapy device

Giampiero Maglia
Salvatore Pirrotta
Luca Bontempi
Manuel Cerini
Davide Fabricatore
Gianluca Ceravolo
Paola Napoli
Antonio Curnis

Introduction: The DX technology allows atrial sensing in single-chamber implantable defibrillators through special RV lead equipped with floating atrial dipole. The DX technology has recently been implemented also in ICDs for cardiac resynchronization therapy (CRT) requiring the implantation of only two leads in patients with no indication to atrial pacing. Several studies have proved the reliability of atrial sensing for the ICD-DX device, while little data are available for CRT-DX devices for which reliable atrial sensing is essential for optimal CRT delivery. We retrospectively evaluated baseline sensing performances in patients with a CRT-DX system as compared with patients with ICD-DX systems.

Methods: Atrial sensing amplitude during sinus rhythm was collected at the time of device implantation. Median values (interquartile range) were then compared between ICD-DX and CRT-DX groups.

Result: A total of 134 patients (median age 60 [54-67], 79.3% male, left ventricle ejection fraction 32% [30%-35%], 28% ischemic etiology) who presented with sinus rhythm at implant were included in the present analysis: 112 (83.6%) received an ICD-DX device, 22 (16.4%) a CRT-DX device. Device-detected atrial sensing amplitude at implant was 3.5 (1.5-5.7) mV in the ICD-DX group, and 2.6 (1.5-4.1) mV in the CRT-DX group (p=0.499). Right ventricular sensing amplitude (ICD DX: 12.1 [8.3-17.3] mV; CRT- DX: 14.4 [10.9-17.0] mV; p=0.183) and pacing impedance (ICD DX: 504 [457-550] Ohm; CRT-DX: 520 [486-550] Ohm; p=0.265) did not differ as well. First 10-day remote monitoring post-implant did not report far field oversensing in both groups, and 99% (95-100) CRT pacing was achieved in the CRT-DX group.

Conclusion: The DX technology showed similar atrial sensing performances when implemented either in single chamber ICDs or in CRT devices. Optimal CRT delivery was achieved in the CRT-DX group, while no far field oversensing was detected perioperatively.