The Use of Atrial Electrogram Morphology as a Supraventricular Tachycardia Discriminator
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Problem: Despite the proven effectiveness of implantable cardioverter defibrillator (ICD), inappropriate ICD discharges remain a significant problem in a number of patients. These shocks are painful, can lead to premature battery depletion, can potentially induce lethal arrhythmias, and can increase psychological stress and affect quality of life in patients and families.

Evidence: One main reason patients receive inappropriate shock is due to supraventricular tachycardia (SVT). Despite the use of current SVT discrimination algorithms, patients with an ICD can experience inappropriate therapy for SVT with rapid ventricular rate. Intra-cardiac atrial electrogram (EGM) morphology may change when the vector of depolarization changes.

Strategy/Practice Change: We sought to determine if the atrial EGM morphology changes between normal sinus rhythm and during ventricular pacing. Changes in atrial EGM morphology may be used as an SVT discriminator to help reduce the frequency of inappropriate ICD therapy.

Evaluation: Prospective design with analysis of 100 consecutive atrial EGMs on patients with dual chamber ICDs. Atrial morphology was examined and compared during sinus rhythm and during ventricular pacing with retrograde conduction.

Results: Retrograde conduction was noted in 67 patients whereas V-A block was seen in 33 patients during ventricular pacing. Of the 67 patients, 24 had a change in atrial morphology, 36 had no change in atrial morphology, and 7 were indiscernible due to excessive artifact or very low voltage.

Recommendation: Since atrial EGM morphology can change between sinus rhythm and ventricular pacing, it may also change between SVT and Ventricular Tachycardia (VT). Atrial EGM morphology may be helpful be in differentiating SVT from Ventricular Tachycardia and help reduce inappropriate ICD therapy when used in addition to current SVT discrimination algorithms.

Lessons Learned: Appropriate programming of ICDs with proper discriminators and algorithm is important to prevent inappropriate shocks.
Bibliography:


