

Cardiovascular MR Imaging: Pushing the Limits, Part 1

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Highlights:

- Cardiac arrhythmia is a major cardiac disease
- Cardiac MRI allows assessment of scar and fibrosis
- High-resolution MRI has the potential to identify the substrate for ventricular arrhythmia
- High-resolution late-gadolinium enhancement can assess patients with left ventricular arrhythmia or atrial fibrillation

Title: CMR in Cardiac Arrhythmias

Target audience: Clinicians and scientists interested in learning about cardiac disease and role of cardiac MRI in patients with ventricular arrhythmia or atrial fibrillation

Abstract:

Sudden cardiac death (SCD), associated with scar-related ventricular tachycardia and fibrillation (VT/VF), is one of the main causes of death in the United States and is one of the most life-threatening arrhythmias in patients with heart failure. The vast majority of patients with coronary artery disease and VT are managed with implantable cardioverter-defibrillator (ICD) therapy, which can terminate VT/VF when it occurs. After ICD implantation, 40%-60% of patients experience recurrent VT if they received the ICD because of secondary prevention but only 2.5% to 12% for primary prevention. To reduce shocks, antiarrhythmic drug therapy or catheter ablation is recommended as adjuvant therapies. Amiodarone and sotalol are commonly prescribed after a single appropriate ICD shock. However, these medications have disappointing efficacy, substantial side effects and long-term costs. Furthermore, there is an adverse interaction between the ICD and antiarrhythmic drugs, which results in ineffective ICD therapy. Prophylactic catheter ablation in scar-related VT is a promising and evolving alternative to drug therapy; In majority of these scar-related VT, knowledge of scar information can be used as a road-map for VT ablation. In this talk, we will discuss the promises and challenges of using CMR for guiding therapy in these patients. We will introduce the methods that are currently being used to increase the spatial resolution of scar imaging to enable imaging of the VT substrate. Our current understanding of VT substrate and role of MRI for guidance of the ablation procedure will be discussed.