

MRI versus CT for Characterization of Pulmonary Vein Morphology before Radiofrequency Catheter Ablation of Atrial Fibrillation

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Background: Accurate assessment of pulmonary vein (PV) anatomy is important for the planning of radiofrequency catheter ablation (RFCA) of atrial fibrillation (AF). This study sought to perform a head-to-head comparison between magnetic resonance imaging (MRI) and multislice computed tomography (CT) for evaluation of PV before RFCA of AF.

Methods and Results: Contrast-enhanced MRI (1.5 Tesla system) and multislice CT (dual-source system) were performed for evaluation of PV in 44 consecutive patients (31 men, 56 ± 10 years) admitted for RFCA of drug-refractory AF. Data on PV anatomy, ostial branching pattern, and ostial dimensions were compared between MRI and multislice CT. Variant PV anatomy was observed in 21 (48%) of patients with both imaging approaches. The incidence of PV ostial branching, as assessed with MRI and multislice CT, was higher on the right, and more common in the inferior than superior vein. Agreement between both imaging modalities for evaluation of variant PV anatomy and ostial branching pattern was nearly perfect (Kappa = 0.87; 95% CI: 0.77, 0.97, kappa = 0.84; 95% CI: 0.75, 0.93, respectively). Assessment of PV ostial cross-sectional area as well as maximal and minimal ostial diameters resulted in a strong agreement and correlation (r values ranged from 0.75 to 0.99, P < 0.001 for all) between the two imaging approaches.

Conclusion: MRI and multislice CT images of the PV appear to provide similar and detailed anatomic and quantitative information before RFCA of AF.