

Dependence of electrogram duration in right posteroseptal atrium and atrium-pulmonary vein junction on pacing site: Mechanism and implications regarding atrioventricular nodal reentrant tachycardia and paroxysmal atrial fibrillation

Chen, YJ Tai, CT Hsieh, MH Tsai, CF Lin, WS Chen, SA

Abstract

Right Posteroseptal Atrium and Atrium-PV Junction. Introduction: The fractionated atrial electrogram, a signal helpful in identifying the target site for radiofrequency catheter ablation of the slow AV nodal pathway, is considered to arise from nonuniform anisotropic electrical activity. However, the effects of pacing sites and radiofrequency ablation on these electrograms are not clear. Similarly, the nature of the fractionated atrial electrogram in the atrium-pulmonary vein junction has yet to be determined. Methods and Results: Two experiments were performed in this study. Experiment 1 evaluated the fractionated atrial electrogram at target sites before and after slow AV nodal pathway ablation during sinus rhythm or during pacing from different sites. Group IA consisted of 16 patients with dual AV nodal pathway physiology and AV nodal reentrant tachycardia who underwent successful ablation without residual slow AV nodal pathway. Group 1B consisted of 7 patients who underwent successful elimination of AV nodal reentry but with residual dual AV nodal pathway physiology, Group IC consisted of 6 patients who still had AV nodal reentrant tachycardia after two applications of radiofrequency energy. In group 1D, there were 16 patients with dual AV nodal pathway physiology, but without inducible AV nodal reentrant tachycardia. In group 1E, there were 15 patients without dual AV nodal pathway physiology. Experiment 2 investigated the fractionated atrial electrogram in the ostium of the left and right superior pulmonary veins in 18 patients with paroxysmal atrial fibrillation (2A) and in 8 patients without paroxysmal atrial fibrillation (2B). Before radiofrequency ablation, electrogram duration in the right posteroseptal atrium during pacing from the middle coronary sinus or the right posterolateral atrium was shorter than that during pacing from the high right atrium (HRA) in all group 1 patients. After the successful elimination of the slow AV nodal pathway conduction in group 1A, atrial electrogram duration during HRA pacing was shorter than that before ablation. In experiment 2 patients, electrogram duration during pacing from the proximal or distal coronary sinus was shorter than that during pacing

from HRA or sinus rhythm, Conclusion: These findings suggest that the fractionated atrial electrograms in the right posteroseptal atrium and ostium of left or right superior pulmonary veins are potentially consistent with nonuniform anisotropic propagation. alternations of electrogram characteristics after successful radiofrequency ablation of the slow AV nodal pathway may arise from the changes of nonuniform anisotropic activity in the right posteroseptal atrium.