Initiation of atrial fibrillation by ectopic beats originating from the pulmonary veins: electrophysiological characteristics, pharmacological response, and effects of radiofrequency ablation.

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摘要

Abstract

BACKGROUND:Atrial fibrillation (AF) can be initiated by ectopic beats originating from the atrial or great venous tissues. This study investigated the anatomic characteristics and electrophysiological properties of pulmonary veins (PVs), as well as the possible mechanisms and response to drugs of ectopic foci, and assessed the effects of radiofrequency (RF) ablation on AF initiated by ectopic beats originating from PVs. METHODS AND RESULTS:Seventy-nine patients with frequent episodes of paroxysmal AF and 10 control patients were included. Distal PVs showed the shortest effective refractory periods (ERPs), and right superior PVs showed a higher incidence of intra-PV conduction block than left superior PVs. Superior and left PVs had longer myocardial sleeves than inferior and right PVs, respectively. These electrophysiological characteristics were similar between AF and control patients. Propranolol, verapamil, and procainamide suppressed ectopic beats that originated from the PVs. Of 116 ectopic foci that initiated AF, 103 (88.8%) originated from PVs. A mean of 7+/-3 RF applications completely eliminated 110 ectopic foci (94.8%). During the 6+/-2-month follow-up period, 68 patients (86. 1%) were free of AF without any antiarrhythmic drugs. Follow-up transesophageal echocardiogram showed 42.4% of ablated PVs had focal stenosis. One patient had mild exertional dyspnea after ablation, but it resolved 3 months later; 1 patient had onset of mild exertional dyspnea 5 months after ablation. CONCLUSIONS:Electrophysiological characteristics of PVs are different from those in the atria. Ectopic beats from PVs can initiate AF, and beta-adrenergic receptor blocker, calcium channel blockers, and sodium channel blockers can suppress these ectopic beats. Careful mapping and

elimination of these ectopic foci can cure paroxysmal AF