Poster Session

1114 Mapping and Ablation of Ventricular Tachycardia

Monday, March 18, 2002, Noon-2:00 pm
Georgia World Congress Center, Hall G
Presentation Hour: 1:00 p.m.-2:00 p.m.

1114-111 Epicardial Radiofrequency Ablation of Ventricular Myocardium: Mechanisms of Lesion Formation and Damage to Adjacent Structures

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Background: Epicardial radiofrequency (RF) ablation has been increasingly used in patients with ventricular tachycardia, but the mechanisms of epicardial lesion formation are not well understood.

Methods: In 23 dogs (16-25 Kg), we compared epicardial (Epi, n=7) versus endocardial ablation (Endo, n=7) using fluoroscopy-guided, standard techniques (70°C±60 sec, 60 W). Further, epicardial RF delivery was assessed during catheter tip irrigation (n=5) and with wet saline (n=7). The lesions were evaluated by removing 1 cm3 pieces of myocardium from the epicardium (Epi group) and from the pericardium (Pericardium group). The electrical properties of these pieces were compared to the electrical properties of the myocardium before RF delivery (Control).

Results: No differences were found in the epicardial and pericardial groups in tissue impedance, bipolar voltage, and tissue resistance. However, no RF lesions were formed in the control group when irrigated with saline or with wet saline. The lesions formed in the Epi and Pericardium groups were similar in size and electrical properties.

Conclusions: RF lesions are formed in the myocardium during epicardial ablation, but not in the pericardium. The mechanisms of lesion formation are not well understood.

1114-114 Differential 12 Lead Electrocardiographic Manifestations of Arrhythmogenic Right Ventricular Dysplasia Versus Right Ventricular Outflow Tract Ventricular Tachycardias


Background: The differential diagnosis for left bundle inferio axis right ventricular tachycardia (VT) includes arrhythmogenic right ventricular dysplasia (ARVD) and idiopathic right ventricular outflow tract (RVOT) ventricular tachycardia. Since they are due to different mechanisms, it should be possible to distinguish between the two conditions using the 12-lead ECG during spontaneous VT.

Methods: Nine patients with a definite diagnosis of ARVD and eighteen patients with RVOT VT were identified from the Mayo Foundation database. Patient age for the ARVD group was 43 ± 22 years and for the RVOT group was 45 ± 27 years. None of the ARVD patients had underlying heart disease. In the RVOT group, one patient had hyperthyroidism, one had coronary artery disease and two had mitral valve prolapse. 12-lead ECGs of spontaneous VT were compared to those of conventional mapping (CM) and noncontact mapping (NCM) with the C rate observed with conventional mapping (CM). Using a logistic regression model, the diagnostic accuracy of the 12-lead ECG was compared to that of CM and NCM.

Results: There were significant differences (using Fisher's Exact Test and tailed p-value) in the 12-lead VT ECGs between the two groups. 9/9 (100%) ARVD patients had deep S waves (Lead I) versus 0/9 (0%) RVOT patients (p = 0.0017). 11/18 (61%) RVOT patients had deep S waves (Lead I) versus 0/9 (0%) ARVD patients (p = 0.0017). 9/9 (100%) ARVD patients had QRS duration (Lead V1 or V2) equal or greater than 140 msec versus 14/18 (78%) RVOT patients (p = 0.0017). 9/9 (100%) ARVD patients had QRS duration (Lead V1 or V2) equal or greater than 140 msec versus 14/18 (78%) RVOT patients (p = 0.0017).

Conclusions: The 12-lead ECG of VT in ARVD is significantly different from that of RVOT. Specific characteristics of the 12-lead ECG in VT differentiate ARVD from RVOT. This information may be useful in determining the underlying disease process to reduce the risk of misclassifying ARVD as benign VT.

1114-115 Is Catheter Ablation of Hemodynamically Unstable Ventricular Tachycardia Feasible Using Noncontact Mapping?

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Background: The non-contact mapping system (NCM) computes virtual electrograms simultaneously at more than 3000 ventricular sites. A single beat of the VT seems to be sufficient to map the VT. The real-time features of this study was to assess the clinical utility of NCM for mapping and ablation unstable VT.

Methods: We evaluated 20 patients (pts) with an implantable cardioverter defibrillator (ICD) with drug refractory monomorphic and hemodynamically unstable VT (24 pts had ischemic VT and 5 pts had nonischemic VT, ejection fraction 33±15%). All pts had at least 2 episodes of unstable VT (mean cycle length 295±75 ms) during the month before treatment. Catheter ablation was performed with a linear lesion at the diastolic pathway just before the exit site. Radiofrequency energy was delivered during sinus rhythm and efficacy was assessed by programmed ventricular stimulation. All pts had a regular follow up in our ICD clinic.