Noninvasive SAECG analysis predicts epicardial ablation approach in arrhythmogenic right ventricular cardiomyopathy

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Introduction: This study investigated the feasibility of using the SAECG in the identification of arrhythmogenic substrate in arrhythmogenic right ventricular cardiomyopathy (ARVC) requiring right ventricular (RV) epicardial approach.

Methods: Ninety-three definite ARVC patients with drug refractory VT were enrolled and reclassified into 2 groups: definite ARVC with successful RV endocardial ablation only (Group 1), definite ARVC with RV epicardial ablation in addition to RV endocardial ablation (Group 2). Baseline characteristics and non-invasive parameters including SAECG were compared.

Result: The groups 2 patients were male predominant, had a worse RV function, higher incidence of syncope and fatal ventricular arrhythmia, and more depolarization abnormality. The Group 2 patients fulfilled more SAECG criteria than Group 1 (2.5 ± 0.8 vs. 1.0 ± 0.7, p < 0.001). After multivariate analysis, independent predictors of epicardial ablation include the numbers of fulfilling SAECG criteria (Odds ratio [OR]: 3.3, 95% confidence interval [CI]: 1.6-6.7, p = 0.001), men (OR: 6.8, 95% CI: 0.9-1.1, p = 0.033) and syncope (OR: 8.6, 95% CI: 0.9-38.8, p = 0.005). Additionally, the patient fulfilled more SAECG criteria was associated with larger RV endocardial unipolar low-voltage zone (LVZ) percentage (p < 0.001), larger RV epicardial bipolar LVZ percentage (p = 0.020), and longer RV endocardial and epicardial activation time (p < 0.001 and p = 0.006).

Conclusion: The number of fulfilled SAECG criteria was associated with epicardial substrate and could identify the potential requirement of the epicardial approach in ARVC patients with drug refractory VA.