

Electrical Substrate Elimination by Epicardial Right Ventricular Ablation in Patients with Brugada Syndrome

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Brugada syndrome (BrS) is a genetically determined disease that predisposes to cardiac arrest and/or sudden cardiac death due to ventricular malignant tachyarrhythmia. Therefore, the use of an implantable cardiac defibrillator (ICD) was an evident option since the first description of the syndrome for BrS patients who usually are young and otherwise healthy individuals. Symptomatic BrS patients can experience recurrent ICD shocks and impaired quality of life, with significant psychological sequelae. Recently, the epicardium of the right ventricle has been reported to be a potential area where the imbalance between eventually abnormal inward/outward currents would manifest. More recently, substrate-based epicardial ablation has been proposed as a promising adjunct in symptomatic BrS patients with recurrent episodes of VF, but the small sample size precluded any firm conclusion on its actual role. We investigated the methodology and results of substrate-based mapping/ablation in a large series of consecutive BrS patients with various clinical presentations, and verified if RFA could normalize the consequences of a genetic disease. We enrolled 135 symptomatic BrS patients having ICD : 63(Group 1) having documented VT/VF and BrS-related symptoms, and 72(Group 2) having inducible VT/VF without ECG documentation at the time of symptoms. 27 patients of Group 1 experienced multiple ICD shocks for recurrent VT/VF episodes. 3D maps before and after ajmaline determined the arrhythmogenic electrophysiological substrate (AES) as characterized by prolonged fragmented ventricular potentials. Primary end-point was identification and elimination of AES leading to ECG pattern normalization and VT/VF non-inducibility. Extensive areas of AES were found in the RV epicardium, which were wider in Group 1(P=0.007) . AES increased after ajmaline in both groups (P < 0.001) and was larger in men (P= 0.008) . The increase of type-1 ST-segment elevation correlated with AES expansion (r=0.682, P < 0.001) . RFA eliminated AES leading to ECG normalization and VT/VF non-inducibility in all patients. During a median follow-up of 10 months, the ECG remained normal even after ajmaline in all except two patients who underwent a repeated effective procedure for recurrent VF. In BrS, AES is commonly located in the RV epicardium and ajmaline determines its extension and distribution, which is correlated with the degree of coved ST-elevation. AES elimination by RFA results in ECG normalization and VT/VF non-inducibility. Substrate-based ablation is effective in potentially eliminating the arrhythmic consequences of this genetic disease.