Endocardial vs endo-epicardial ablation of ventricular arrhythmia in arrhythmogenic right ventricular cardiomyopathy: a single center experience

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Background: The majority of patients have a sub-epicardial scar as a substrate for VT episodes.
Purpose: We sought to compare the efficacy of endocardial (ENDO) and epicardial (EPI) substrate modification in patients with ARVC.
Methods: 20 consecutive ARVC patients (mean age 41,4±13,8, 70% males; ICD previously implanted in 10 patients) with indications to ventricular arrhythmia ablation (RFA) were included into a prospective observational study. The EPI group consisted of 10 patients with sustained ventricular tachycardia (VT) (definite diagnosis ARVC – 8 patients; borderline – 1, possible – 1) who signed an informed consent to epicardial access. The ENDO group included 10 patients (definite diagnosis ARVC – 9 patients), five of them demonstrated sustained VT and 5 patients had frequent symptomatic premature ventricular contractions (PVC). Epicardial access in the EPI group was obtained through subxyphoid puncture. Bi- and unipolar voltage mapping of endocardial and epicardial surfaces was performed. Maps were evaluated for the presence of local abnormal ventricular electrical activity (LAVA, low-voltage areas and sites with highly fractionated or late activity). Ablation was performed at sites of LAVA on either side of the ventricular wall. In the ENDO group endocardial only ablation at LAVA sites was performed. RF energy ablation was 40W at the epicardial surface and 40–50W at the endocardial surface.
Results: In the EPI group endocardially mapped area of unipolar endocardial low voltage zone (LVZ) significantly prevailed over bipolar endocardial area of LVZ: 75.4 cm^2 [IQR: 23.2; 211.9] vs 6.7 cm^2 [IQR: 4.4; 35.5](P=0.009). Epicardial bipolar LVZ area prevailed over unipolar epicardial LVZ area: 65.3 cm^2 [IQR: 55.6; 91.3] vs 6.7 cm^2 [IQR: 4.4; 35.3] (P=0.005). Endocardial unipolar LVZ area in the EPI group was larger than in the ENDO group (P>0,05). After ablation non-inducibility of any ventricular arrhythmia was achieved in 90% of patients in the EPI group and in 80% of cases in the ENDO group. During a mean follow-up period of 22.3±10.5 months freedom of ventricular arrhythmia recurrence was 70% in the EPI group and 100% in the control group.
Conclusions: Although epicardial area of abnormal potentials significantly prevails over endocardial area, endocardial unipolar mapping and higher RF ablation power allow performing successful ventricular arrhythmia treatment in the majority of ARVC patients.