Monomorphic ventricular premature contractions originating in the vicinity of the His bundle in a young patient: should we always ablate?

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Ablation of ventricular arrhythmias originating in the vicinity of the His bundle is challenging. Prior studies reported the electrocardiographic characteristics of para-Hisian ventricular premature contractions (VPCs) [1, 2] and the electrocardiographic characteristics predicting the precise localisation of VPCs originating within the para-Hisian area [1]. Para-Hisian VPCs were classified into two subgroups according to the anatomic site of origin within the right ventricle (RV): either above (RV antero-septum) or below (RV mid-septum) the site recording His bundle potential (HBP) [1].

An 18-year-old male patient, without a structural heart disease (echocardiography, multi-slice computed tomography), with symptomatic (palpitations, presyncope, and two syncopal episodes), drug-refractory (β-blocker), frequent monomorphic VPCs (54,621 in 24-h Holter [24HM] electrocardiogram [ECG] monitoring), and non-sustained monomorphic ventricular tachycardia (VT) was referred for electrophysiological study performed under local anaesthesia. The surface ECG showed a pattern of para-Hisian mid-septal VPCs (Fig. 1A). Because the ventricular activation in the RV HBP region preceded the QRS onset during VPCs, mapping from both the right (Fig. 1B) and left ventricle (LV; Fig. 1C) was performed to attenuate the risk of inadvertent atrioventricular (AV) block [1, 3]. The local ventricular bipolar recordings from the distal mapping catheter (Fig. 1B, C) preceded the onset of the VPCs in RV (Fig. 1B) and LV (Fig. 1C) by 50 ms and 42 ms, respectively. The local bipolar electrogram at the ablation site revealed high-frequency fragmented potentials that were typical for para-Hisian mid-septal VPCs [1, 4]. The unipolar electrogram (Fig. 1B, C) had a QS morphology with a fast downstroke slope (yellow arrows, Fig. 1B, C), further proving a good site for ablation. Application of radiofrequency (RF) energy at the RV mid-septum close to HBP region carries a particularly high risk of inadvertent AV conduction block [1]. Due to the apparent local HBP (red arrows, Fig. 1B, C), after a discussion with the young patient and his parents, the procedure was ceased at that point. Both the patient and his parents were educated about possible symptoms of arrhythmia and the cryoablation option (with its relatively high rate of arrhythmia recurrence and a low but still existing risk of procedural complete heart block). Therapy with sotalol was started, and QT monitoring with ECG in the first three days and 24HM every three months was initiated. Initial improvement during the first year (asymptomatic 11,345 VPCs without VT in 24HM) was interrupted by an episode of presyncope related to heart palpitation reported by the patient. Although the check-up performed at that time (echocardiography, exercise test, tilt-test) revealed no abnormalities, spontaneous and complete remission of para-Hisian VPCs/VT and their symptoms has been clearly documented by several check-ups and 24HMs during a successive four-year follow-up. The decision not to ablate proved to be right; however, according to the guidelines on syncope and ventricular arrhythmias/sudden cardiac death, the patient warranted an invasive strategy.

Figure 1. A. 12-lead electrocardiogram; B. Bipolar (ABL d, ADL p) and unipolar (UNI) mapping of the right ventricle (RV); C. Bipolar (ABL d, ADL p) and unipolar (UNI) mapping of the left ventricle (LV)

References