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Insights from endomyocardial biopsy in patients with ventricular arrhythmias and left ventricular non-ischaemic scar

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Topic(s):
Arrhythmias, General: Invasive Diagnostic Methods

Citation:
Background. In both cardiac magnetic resonance (CMR) and post-mortem studies, left ventricular non-ischaemic scar (LVNIS) has been associated with ventricular arrhythmias (VA) and sudden cardiac death (SCD). However, the additive role of in-vivo endomyocardial biopsy (EMB) in patients with LVNIS has been poorly investigated so far.

Purpose. To evaluate the impact of EMB on both diagnosis and therapeutic management of patients presenting with VA and CMR evidence of LVNIS.

Methods. We retrospectively analyzed a cohort of 111 patients (69% males, mean age 45±12y) with CMR-defined LVNIS, following their first documented episode of symptomatic VA (including ventricular fibrillation, sustained/non-sustained VT, and frequent premature ventricular complexes). No one was known for any cardiac disease. Furthermore, all of the patients had normal epicardial coronary arteries, and LV non-ischaemic late gadolinium enhancement (LGE) at CMR. In the absence of diagnostic criteria for specific heart diseases, all of the patients underwent EMB as second-level diagnostic technique. Treatment choices, including ICD implantation, were driven by the best clinical practice, based on guidelines recommendations. Median FU of the study was 58 months.

Results. VA at presentation were malignant (sustained VT, VF) in 65 cases (59%). Baseline mean LVEF in the population was 48±15%, with dilated LV and LVEF < 35% documented in 61 (55%) and 26 (23%) patients, respectively. Overall, EMB allowed for a definite diagnosis in 76 patients (68%), in detail: myocarditis (n=63), specific cardiomyopathy (n=13), and nonspecific findings (n=35). As for the subsequent therapeutic choices, we documented that: a) ICD implantation in secondary prevention was similar among groups (23/25 vs. 8/10 vs. 27/30, p=n.s.); b) ICD implantation in primary prevention occurred in 4/14 myocarditis vs. 12/12 non-myocarditis patients (p<0.001); in fact, following immunosuppressive therapy, 10 cases with virus-negative active myocarditis showed a significant LVEF recovery by 12-month median FU; c) among patients undergone successful (class A) transcatheter ablation (n=44), malignant VAs recurrences were found more commonly in patients with specific cardiomyopathies (5/9 vs. 1/35 with myocarditis or nonspecific findings, p<0.001), in particular arrhythmogenic cardiomyopathy (n=3) and cardiac sarcoidosis (n=2).

Conclusion. In patients presenting with VA and CMR-defined LVNIS, EMB allows for a more accurate aetiology definition, and the subsequent identification of the best therapeutic strategy.