VT catheter ablation and mapping system may decrease the rate of sudden cardiac death through VF/VT in patients with an implantable cardioverter defibrillator

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INTRODUCTION

Patients with ventricular tachycardia (VT) and a history of myocardial infarction are at high risk of recurrent VT, or VF, and sudden death. In patients with high risk of ventricular arrhythmia, intervention with an implantable cardioverter defibrillator (ICD) reduces rates of sudden cardiac death and total mortality compared with treatment with antiarrhythmic drugs. However, patients who receive ICD shocks have a decreased quality of life and increased mortality compared with patients who do not receive shocks, even if the shocks are inappropriate

CASE REPORT

A 65 years old man presented to the ED for palpitations, dizziness and multiple ICD shocks.

Patient had a background of inferior myocardial infarction - occlusion in the middle segment and a coronary stent Xience 2,75/24mm; with good flow, TIMI 3 in the right coronary artery (two years ago), followed by an implantable dual chamber ICD (St. Jude Ellipse) for recurrent monomorphic VT (fig. 1a) 3 months after. He was on metoprolol and amiodarona since then.

At presentation - hemodynamically stable, sinus rhythm with SAP of 120-130mmHg (fig. 1b), with negative troponin levels, no biochemical or clinical signs of myocardial ischemia. During interrogation of the ICD 14 shocks were observed in the device memory, ineffective with proarrhythmic effect, with degeneration into VF (fig. 2a). Treatment with cordarone was discontinued and sotalol treatment was initiated for ineffective shocks. The fluoroscopic image of the ICD - fig 3.

Transthoracic echocardiogram showed akinetic inferior wall and an overall LVEF of 45% without further modifications compared to the previous examination

Control coronarography - a patent stent without other lesions.

An emergency ablation procedure was scheduled. After accesing the left ventricle with a three dimension mapping system, the voltage map was performed. A scar with area of 22cm² (10% of the left ventricle aria -fig 2b) was observed.

The fluoroscopic image of the ICD revealed the proximal coil at the right atrium level, device reprogramming was needed and proximal coil was excluded from the shock configuration

During electrophysiological study with PVC using a drive cycle lengths of 600ms at the RV apex, delivering three ventricular extrastimulus VT was induce with a cicle length of 384ms (156b/m), difficult to interrupted, repeated overdrive and lidocaine administration was needed. Ablation was performed in sinus rhythm. We target the areas of fragmented and late potential, postablation without inducibility of clinical VT (fig 4). Follow-up at 6 months, 1 and 2 years after without any episodes of VT/VF or ICD shocks.

CONCLUSION

Catheter ablation of VT can effectively reduce the number of ICD interventions, The three dimensional mapping systems allow not only activation mapping during tachycardia but also substrate mapping during sinus rhythm.