Novel Application of 18F-Fluorodeoxyglucose Positron Emission Tomography / Magnetic Resonance Imaging to Assess a Patient with Frequent Non-Sustained Ventricular Tachycardia

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Introduction: There is growing evidence to prove the clinical implication of contrast-enhanced magnetic resonance imaging (MRI) in patients with ventricular arrhythmia (VA). 18F-fluorodeoxyglucose positron emission tomography (FDG-PET) has a well-established role in detecting inflammation.

Methods: N/A

Result: A 28-year-old female was referred to our hospital due to symptomatic ventricular arrhythmia (VA) for 6 months. A simultaneous 18F-fluorodeoxyglucose (FDG) positron emission tomography / contrast-enhanced magnetic resonance imaging (PET/MRI) imaging (SIGNA™ 3.0T PETMR, GE Healthcare) was performed before a further interventional procedure, showing late gadolinium enhancement (LGE) and increased FDG uptake, each in the LV mid to apical inferior septum and in the mid to the apical inferior free wall. Three-dimensional LV endocardial was created using Carto 3 (Biosense Webster, Inc., Diamond Bar, CA, USA) with a 3.5 mm irrigated tip catheter (Thermocool, Biosense Webster, Inc., Diamond Bar, CA, USA). LV endocardial bipolar revealed low-voltage zone (LVZ) in the inferior wall, which was corresponding to LGE area and origin of first inducible ventricular tachycardia. The second identified VT was identified within the FDF uptake area, which was within the normal bipolar voltage area. Catheter ablation achieved negative inducibility during procedure. Occasional isolated PVC recurrence was noticed with morphology like the second VT. Under the impression of inflammatory related VA as based on the FDG-PET, prednisolone 10mg per day has been prescribed for 2 months and then tapered. The PVC burden decreased to less than 1% after the medical management.

Conclusion: The simultaneous PET and MRI scan identify the NSVT origin and the inflammatory nature of this patients.