Introduction: Background: Drug-refractory ventricular arrhythmia (VA) in non-ischemic cardiomyopathy (NICM) remains to be challenging despite catheter ablation. Objective: To explore the value of hybrid magnetic resonance imaging (MRI) and positron emission tomography (PET) using 18F-fluorodeoxyglucose (FDG) for NICM with VA.

Methods: Patients with NICM and drug refractory VA underwent hybrid MRI/PET with 18F-FDG and late gadolinium enhancement (LGE) to assess the pattern of inflammatory activity and scar, respectively. The pattern of cardiac 18F-FDG uptake were classified as pattern (1) no uptake, (2) diffuse uptake, (3) focal uptake, and (4) focal-on-diffuse uptake. Patterns 3 and 4 were considered positive findings. Patients underwent catheter ablation and were followed-up for at least 6 months. Receiver-operating characteristic methods were used to identify imaging biomarkers.

Result: Catheter ablation was performed in 12 out of 15 consecutive patients with drug refractory VA. Elimination and non-inducibility of VA were achieved in all patients (100%). Recurrence after ablation were found in 4 patients (33.3%) after a mean follow-up of 6.5 months. Comparing the LGE in the MRI, the presence of 18F-FDG uptake at baseline better predict long-term VA recurrence. Additional prednisolone successfully suppressed recurrent VA in 3 patients (20%) with increased 18F-FDG uptake.

Conclusion: MRI/PET imaging provided information about the pattern of injury and disease activity in a single scan. Furthermore, it holds a major promise of prognostic value in patients with NICM and drug refractory VA.