Outcome of VT Ablation in patients on Left Ventricular Assist Device (LVAD) - a descriptive study

Nee Hooi Tan
Khine Sein
Hernandez Jemelee
Paul Chun Yih Lim
Kelvin Chi Ming Chua
Eric Tien Siang Lim
Kah Leng Ho
Boon Yew Tan
Daniel Thuan Tee Chong
Wee Siong Teo
Chi Keong Ching

Introduction: Ventricular arrhythmias (VAs) in patient post-LVAD implantation are associated with considerable morbidity from recurrent implantable cardioverter-defibrillator (ICD) shocks, progressive heart failure and increased mortality risk.

Methods: We recruited 2 patients with continuous flow HeartMate II LVADs who underwent radiofrequency catheter ablation (RFCA) in 2018 for incessant, medically refractory VT requiring multiple ICD therapies. We aim to describe the electrophysiological (EP) findings & procedure details.

Result: Mean age was 70.5 +/- 0.7 years old (1 male). The etiology of heart failure was ischaemic cardiomyopathy in 50% of patients (n=1). Mean LVEF was 23 +/- 11%. LVAD were implanted as destination therapy in both patients who were deemed unsuitable for cardiac transplantation. Mean time from LVAD implantation to the development of VT was 42.5 +/- 17.7 months. VT was induced in the EP lab with programmed extrastimulation (PES) at the right ventricular apex of up to 3 extrastimuli with a mean of 1.5 +/- 0.7 VT morphologies induced. Activation mapping & substrate mapping was performed. Mean VT cycle length (CL) was 434 +/- 61 ms. 50% of patients (n=1) is scar-related re-entry VT (RFCA done at the basal to mid/distal anteroseptal and mid/distal anterior LV segments) and 50% of patients (n=1) is cannula-related VT (RFCA done at left posteroapical septal region between the left posterior fascicular exit site & the LVAD cannula inflow). Catheter access to the left ventricle was performed via a transseptal puncture in both patients. Mean procedure time was 295 +/- 7.07 minutes & mean fluoroscopy screening time was 59.89 +/- 7.87 minutes. Mean RFCA time was 2368 +/- 1062 seconds. The VT was successfully treated with RFCA & non-inducibility of clinical VT was achieved in both patients with no procedural related complications & death. At 6 months follow-up, there was no recurrence of VT observed.

Conclusion: In this single centre study, RFCA is a viable option & can be safely performed in patients with LVAD presented with incessant, medically refractory VT. However, longer-term follow up is required & more data is also required to identify predictors of VT recurrence.