HeartMate 3- Challenges in Ventricular Tachycardia Ablation

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Background: HeartMate3TM (HM3) is a relatively new left ventricular assist device (LVAD) system. Its design and magnetically levitated pump may impact VTA.

Objectives: To describe clinical characteristics, procedural details, specific challenges and outcomes in patients with HM3 referred for ventricular tachycardia ablation (VTA).

Methods: Data was collected from patients implanted with an HM3 system who underwent VTA in 7 tertiary centers. Data included baseline patient characteristics, procedural data, mortality, and arrhythmia-free survival.

Results: The study cohort included 19 patients (18 male, aged 65 ± 7.8 years) with low left ventricular ejection fraction (LVEF, 17 ± 5%), presenting with VT (53% with storm VT). VTs were induced in 89% of patients and a total of 41 VTs were observed. Severe electromagnetic interference was present in the surface ECG (Figure A) but not on endocardial electrograms (Figure B). Hence, VT localization required analysis of intra-cardiac signals or the use of filter in the 40-20 Hz range. A total of 32 VTs were mapped and were successfully ablated (31% to the anterior wall, 38% to the septum, and only 9% to the inflow cannula region). Notably, the large pump housing tends to obscure clear visualization of the apical region in fluoroscopy particularly in the LAO view (Figure C,D). Therefore, three-dimensional electro-anatomical mapping was aided by ICE or CARTOSound in 71% cases (Figure E). Non-inducibility of any VT was reached in 11 patients (58%). Over a follow up of 429 (IQR 101-692) days, 5 (26%) patients underwent a redo VT ablation due to recurrent VTA and 2 (11%) patients died.

Conclusions: VT ablation in patients with HM3 is feasible and safe when done in the appropriate setup. Long-term arrhythmia free survival is acceptable but not well predicted by non-inducibility at the end of the procedure.

Abstract Figure. HeartMate3 ablation Challenges