

P355

Complete non-inducibility after radiofrequency ablation for electrical storm improves survival rates

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Background: Electric storm is a life threatening condition, that can complicate multiple cardiac pathologies and is associated with high mortality. Catheter ablation has been shown to reduce ventricular tachycardia (VT) burden in patients with electrical storm but the optimal procedural endpoint and the therapeutic particularities required by different etiologies are still under debate.

Purpose: Our objective was to determine if there are any periprocedural factors that influence midterm outcomes. We also sought if there were any significant differences between the results for ischemic and nonischemic patients.

Methods: The study included 66 consecutive patients, mean age 60 years, 82% males, treated for electrical storm in our center with endocardial/endo-epicardial radiofrequency catheter ablation (with or without remote magnetic navigation). Acute success was defined as elimination of the clinical tachycardia with complete non-inducibility (including ventricular fibrillation) or non-inducibility for monomorphic VT with programmed ventricular stimulation using up to 4 extrastimuli. Mean follow-up duration was 9.4 months and the type of recurrence was catalogued in 3 categories: initial VT (isolated), electric storm and other sustained VT.

Results: The overall acute success rate was 93%, complete non-inducibility was achieved in 64.5% and non-inducibility for monomorphic VT in 87.5% of the cases. Epicardial approach was used in 44% of the non-ischemic cases vs 10.5% of the ischemic ones ($p = 0.005$). There were no significant differences between complete noninducibility rates and recurrence/death rates of the ischemic vs nonischemic groups. Among the variables analysed for predicting noninducibility, only two reached statistical significance: mean QRS duration of the clinical tachycardia (160 ± 32 ms vs 240 ± 63.3 ms, $p = 0.02$) and shortest RS complex (124 ± 14.7 ms vs 210 ± 12 ms, $p = 0.02$). Recurrent ventricular arrhythmia occurred in 25% of the patients during follow up, from which: 27.2 % initial VT (isolated), 36.4% electric storm and 36.4% other sustained VT. Death rate was 10.6% (7 patients). Kaplan Meier plot showed that the lot with complete noninducibility after programmed ventricular stimulation had better survival rates ($p = 0.01$).

Conclusions: Ablative therapy had a good acute success rate, without significant differences between ischemic and nonischemic patients in our study. Complete noninducibility after programmed ventricular stimulation after ablation was associated with better survival rates. Unsuccessful ablation is a predictor of inhospital death of these patients.