

Recurring Patterns of Ventricular Response During Persistent Atrial Fibrillation Correlate with the Ablation Outcomes

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Aim: The ventricular response during atrial fibrillation (AF) has been shown to be modulated by the atrial rate. We hypothesized that the dynamics of ventricular response during persistent AF (pAF) correlates with the outcomes of catheter ablation.

Methods: In 40 consecutive pts (61 ± 8 y, sustained AF 19 ± 11 m), pulmonary vein isolation, defragmentation and linear ablations were performed within the left atrium (LA) until pAF termination or cardioversion. Recurrence quantification analysis was performed on RR-interval time series extracted from 5-min ECG recorded before ablation (BL) and at the end of LA ablation (end_ABL). Percentage of recurring points (RP) and percentage of determinism (DET) were computed as measures of the temporal regularity of RR-intervals. AF recurrence during follow-up (FU) was defined as any atrial arrhythmia > 30 sec.

Results: pAF was terminated within the LA in 70% (28/40, LT) of the pts, while 30% (12/40, NLT) were not. Over a mean FU of 34 ± 14 months, recurrence occurred in 100% of NLT pts and in 71% of LT pts (LT_Rec), while 29% of LT pts (LT_SR) remained in sinus rhythm after a single procedure. NLT pts, all with recurrence at FU, displayed significantly lower RP and DET values, indicative of a higher complexity of RR-intervals both at BL and at end_ABL than pts with a successful procedure. Higher DET and RP values indicative of decreased complexity of RR-intervals at end_ABL were associated with AF termination and reduced AF recurrence at FU.

Conclusion: Complexity measures of ventricular response in pAF appear as promising parameters of catheter ablation outcomes.

