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Burden of atrial ectopy after pulmonary vein isolation is a predictor of procedural success

Authors:
P Koopman¹, E Bakelants¹, J Schurmans¹, D Dilling¹, J Vijgen¹, ¹Heart Centre Hasselt - Hasselt - Belgium,

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Introduction

Although pulmonary vein isolation (PVI) is accepted as a successful treatment for atrial fibrillation (AF), several patients still suffer from AF recurrence after ablation.

Purpose

The aim of this study was to investigate if the residual burden of atrial ectopy following PVI is related to procedural success.

Methods

We retrospectively studied 336 consecutive patients with AF who underwent a first PVI in our center between July 2014 and October 2016, using different ablation techniques. The ablation procedure was performed with CARTO mapping for 104 patients, EnSite NavX for 15 patients and the endoscopic laser balloon ablation system (LBA) for 160 patients. Recurrence of AF was defined as an episode of AF lasting more than 30 seconds after a blanking period of three months following ablation, or any redo ablation requiring re-isolation of the pulmonary veins following the first ablation.

Results

Mean age was 61.9 ±9.9 years and 70% were male. 64% of patients had paroxysmal AF. Using Kaplan-Meier survival analysis, at a mean follow up of 17.6 months, probability of freedom from AF was significantly different between the used ablation techniques: 82.3% for CARTO, 65.5% for EnSite NavX and 87.8% for LBA (P=0.0482). Univariate analysis indicated that left atrial volume (LAV) (P=0.0397), number of atrial ectopic beats at 24 hour holter recording three months after ablation (AEB/24h) (P=0.0019) and ablation technique (P=0.0025) have a significant effect on AF recurrence after PVI. Multivariate analysis showed that AEB/24h (P=0.0285), ablation technique (P=0.0189), and spontaneous presence of sinus rhythm at the end of ablation (not requiring cardioversion) (P=0.0142) have an independent and significant effect on AF recurrence after PVI.

Average AEB/24h was significantly different between the three different ablation techniques: 512/24h for CARTO, 1811/24h for EnSite NavX and 235/24h for LAB (P=0.0021). Optimal cut-off point for recurrence risk was established at 60 AEB/24h, with a specificity of 61% and a sensitivity of 74%. Multivariate analysis showed that procedure time (P=0.0229) and ablation technique (P=0.0103) have a significant effect on AEB/24h after PVI.

Conclusions

AEB/24h is a strong predictor for AF recurrence. Type of ablation technique has a significant influence on AEB/24h and on the outcome of PVI, with the lowest AF recurrence for LBA.