Impact of Total Area of Left Atrial Complex Fractionated Electrograms on Catheter Ablation of Atrial Fibrillation

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Background: It was reported that ablation of complex fractionated atrial electrograms (CFAE) added to pulmonary vein isolation (PVI) was effective in some patients with atrial fibrillation (AF). However, it has been unclear the impact of total area of CFAE on catheter ablation in these patients.

Methods: Consecutive 29 patients (paroxysmal (PAF): n=17, persistent (PerAF): n=12) who underwent catheter ablation of AF were studied. Left atrial mapping was performed by electroanatomical mapping system during ongoing AF. 98±15 points per patients were determined to CFAE by automated software. The points with an Average Complex Interval (ACI) <75ms were considered as highly frequent CFAE (HF-CFAE). Total area of HF-CFAE was measured in the LA. After the mapping, PVI was performed in all the patients, except one patient who developed cardiac tamponade during the mapping. Additional ablation was performed if AF was not terminated after PVI.

Results: Total area of HF-CFAE was significantly smaller in PAF than PerAF (18.1±8.5 cm² versus 44.2±31.5 cm², p=0.003). AF termination was observed more frequently in PAF (93.7% versus 33.5%, p=0.0007). There was significant difference of HF-CFAE area between patients with AF termination by catheter ablation and patients who required electrical cardioversion (20.8±11.29 cm² versus 47.8±35.0 cm², p=0.0047).

Conclusions: PerAF had significantly larger HF-CFAE area than PAF. AF termination by catheter ablation was associated with total area of HF-CFAE in the LA.

Keywords: atrial fibrillation, catheter ablation