EC1_5

Size Does Matter: Association between Pulmonary Vein Size and Arrhythmogenity During Pulmonary Vein Isolation with PVAC®

Avishag Laish-Farkash, Amos Katz, Chaim Yosefi, Shalom Abuhatzera, Yair Elitzur, Vladimir Khalameizer
Cardiology Department, Electrophysiology Unit, Barzilai Medical Center, Ben Gurion University of the Negev, Israel

Background:
Previous studies highlight the importance of focal and local reentry activity within pulmonary veins (PV) in initiating atrial fibrillation (AF). Studies show that if patients have one arrhythmogenic vein, isolation of this vein alone may be sufficient. In addition, a computational analysis in a canine model show that wider and longer PVs contribute significantly to PV arrhythmogenesis. We checked whether PV size is associated with arrhythmogenity of the vein during pulmonary vein isolation (PVI).

Methods:
We studied prospectively 30 consecutive patients with AF who underwent PVI using the multi-electrode Pulmonary Vein Ablation Catheter® (PVAC®; Medtronic, Ablation Frontiers) between February and November 2012. Arrhythmogenic PVs were identified during ablation if they had either multiple ectopic beats, re-initiation of AF, or periods of paroxysmal short cycle length recording. Selective angiograms of all PVs were performed before introducing the PVAC® and were used for measuring PV diameter later on by a blinded investigator. Proportion (95% CI) of concordance and Kappa measure of agreement between the largest PV and arrhythmogenity were calculated. Fisher's exact test was used in case of 2*2 tables.

Results:
Thirty patients (60% men, 60±11 years, 93% paroxysmal, 10% redo) were studied. Arrhythmogenity was found in 79.3% of the largest PV (95%CI 61.9-91.2, Kappa=0.787). Analysis of each vein separately has shown significant association in all veins except in RIPV: the ratio of number of arrhythmogenic veins out of the number of largest veins was significantly larger than the ratio of arrhythmogenic veins out of the non-largest veins (LSPV: 100% vs 25%, $p<0.001$; LIPV: 83% vs 22%, $p=0.011$; RSPV: 83% vs 26%, $p=0.018$; RIPV: 33% vs 23%, $p=1$; Left common PV: 100% vs 8%, $p<0.001$).

Conclusions:
Our preliminary results show that larger PV diameter is highly associated with PV arrhythmogenity during PVI with PVAC®. Future studies are needed to clarify whether ablating the largest vein alone is sufficient.