

Pulmonary vein isolation with cryoenergy: does one balloon size fit all?

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Introduction: Pulmonary vein (PV) isolation is well accepted as ablative therapy in eliminating highly symptomatic atrial fibrillation (AF). Due to potential disadvantages of radiofrequency a novel balloon-based catheter has been developed using cryoenergy as alternative energy source. Effective ablation with the cryoballoon requires correct positioning at the ostium of each PV. Due to the variable anatomy and number of PVs the use of a single device might be insufficient.

Methods: In our study we included a consecutive series of patients with paroxysmal or persistent AF, who were treated with a new percutaneous balloon-based cryothermal ablation catheter (ARCTIC FRONT[®], CryoCath Technologies Inc.). The device is available in 2 sizes (23 or 28mm diameter). The balloon selection was based on the PV anatomy, which was assessed before from 3D reconstructions of magnetic resonance angiography or spiral computed tomography. Isolation of the PV was proved with a multipolar LASSO catheter.

Results: During a period of 19 months 192 pts (129m; 58,8 ±11,3y) underwent cryothermal ablation for AF, 17 pts underwent two procedures. The diameter for the PV were 15,3 ±7,2mm (right superior PV), 13,9±6,9mm (right inferior PV), 14,8±7,6mm (left superior PV), 12,7 ±6,2mm (left inferior PV). In 12 pts accessory PVs were found, 4 pts demonstrated a common ostium (3 left-sided PVs: diameter 26,1±1,5mm; 1 right-sided PV: 25mm). Cryoenergy was applied with a single 28mm-balloon in 119 pts and with a 23 mm balloon in 75 pts, both balloon sizes were used in 15 pts. In 11 of these pts the 28mm balloon was selected as first-line device, in 4 pt there was a cross-over from the 23- to the 28mm balloon. The primary success rate was 86% and 89% with the 28mm resp. 23mm balloon. Using both balloons 91% of all veins could be isolated.

Conclusions: Preoperatively acquired CT or MR images provide detailed information about the number and the anatomy of pulmonary veins. This is helpful for selecting the best suitable device in cryothermal ablation for pts with atrial fibrillation. In a large majority the procedure can be effectively performed with a single cryoballoon. This may improve efficacy and reduce procedure time and costs.

Presented at the Heart Rhythm Society 2008 Scientific Sessions, San Francisco, CA May 14-17.