CRYOBALLOON ABLATION OF PAROXYSMAL ATRIAL FIBRILLATION GUIDED BY INTRACARDIAC ECHOCARDIOGRAPHY: PREDICTION OF ACUTE SUCCESS BY A NON-FLUOROSCOPIC IMAGING TECHNIQUE

ACC Poster Contributions
Georgia World Congress Center, Hall B5
Sunday, March 14, 2010, 3:30 p.m.-4:30 p.m.

Session Title: Clinical Electrophysiology–Supraventricular Arrhythmias
Abstract Category: Clinical Electrophysiology–Supraventricular Arrhythmias
Presentation Number: 1079-136

Authors: Georg Nölker, Johannes Heintze, Klaus J. Gutleben, Bogdan G. Muntean, Ameera Yalda, Vanessa Pütz, Dieter Horstkotte, Jürgen Vogt, Department of Cardiology, Heart and Diabetes Center North Rhine-Westphalia, Ruhr University Bochum, Bad Oeynhausen, Germany

Background: Cryoballoon ablation has been adopted for pulmonary vein (PV) isolation in many centers. Complete occlusion of PV and adequate balloon size are essential for effectiveness of cryoenergy delivery. Traditionally decision for balloon sizes and confirmation of PV occlusion is based on PV angiography. The aim of this study was to replace repetitive angiographic imaging by intracardiac echocardiography (ICE) and to demonstrate its usefulness for balloon guiding and monitoring of PV peak flow velocity.

Methods: Consecutive patients undergoing PV cryoballoon ablation or reablation for drug refractory paroxysmal atrial fibrillation were included in this study. Width of the PV antra was measured by ICE as well as by PV angiography and decision for an adequate balloon size was based on both. Ostium occlusion was proved by ICE color flow doppler (CFD). Ostial peak pulsed-wave doppler PV flow was assessed before and after PV isolation.

Results: A total of 61 PVs were treated in 18 patients (58 ± 13 years, 13 males). Decision for the balloon size was similar either based upon angiography or on ICE (r=1.0). Balloons were adequate in all patients. A single 23 mm or 28 mm balloon was chosen in 5 and 4 patients, respectively. Two different sized balloons were necessary in 9 patients. PVI was evaluated after 1-2 cryo applications. Total occlusion of the PV was confirmed by CFD before or during ablation (after pull-down maneuvers). Successful PVI was predicted in 129/137 (95%) and unsuccessful PVI in 8/8 patients (100%). Two pulse wave doppler patterns were detected enabling to distinguish leak flow (continuous high frequency) from adjacent PV flow (accelerated double peak PV flow). Pre- and postablation maximum peak flows were 0.47 ± 0.12 m/s, 0.50 ± 0.12 m/s respectively (n.s.) indicating no acute narrowing of PV ostia. PVI was finally confirmed by entrance block in all PVs after 2.4 ± 0.4 cryo applications. No procedural complications occurred.

Conclusions: ICE is a novel imaging technique for cryoballoon ablation. It allows to predict of acute success, decision for adequate balloon size, exact balloon placement and excludes acute narrowing of PV ostia.