Computed Tomography Guided Evaluation of Pulmonary Vein Anatomy Following Percutaneous Cryoablation: 12-Month Results

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Background: Pulmonary vein isolation (PVI), using radiofrequency energy, for treatment of atrial fibrillation (AF) has been associated with complications including pulmonary vein stenosis or thrombosis. The purpose of this study was to prospectively evaluate the PV anatomy following cryoablative PVI.

Methods: 50 patients underwent percutaneous PVI in 3 academic centres. Contrast-enhanced spiral or multi-slice spiral CT with a 1.25 mm slice thickness was performed before, 3 and 12 months following PVI. All examinations were read blinded to the location(s) of ablation. PVs were evaluated quantitatively and qualitatively: the diameter at ostium and at 1 cm from ostium were measured. The presence and location of luminal irregularity or thrombosis was also assessed.

Results: In ablated veins, the mean diameters at ostium were right inferior PV 1.58±0.34, 1.55±0.29 and 1.66±0.15 cm, right upper PV 1.59±0.22, 1.53±0.24 and 1.47±0.26 cm, left inferior PV 1.29±0.33, 1.24±0.33 and 1.13±0.25 cm, left upper PV 1.73±0.38, 1.72±0.36 and 1.67±0.36 cm before the procedure and, 3 and 12 months after the procedure respectively. No significant difference (p > 0.05) was found between diameter in ablated versus not ablated veins before and after the procedure. Three patients presented with luminal irregularity before the procedure. No patient showed luminal irregularity or thrombosis of PV following cryo-ablation.

Conclusions: These results suggest that PVI for the treatment of AF is not associated with stenosis or thrombosis of cryoablated PVs after one year follow-up.

Usefulness of a Ventricular Extrastimulus From the Summit of the Ventricular Septum in Diagnosis of Septal Accessory Pathway

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Background: A ventricular extrastimulus (VES) delivered when the His bundle is refractory that advances the subsequent atrial deflection proves the existence of an accessory pathway (AP). Moreover, a VES delivered during His bundle refractoriness which terminates the tachycardia without succeeding atrial activation proves participation of the AP in the tachycardia circuit. The purpose of the study was to compare delivery of a VES from the right ventricular (RV) apex versus the summit of the RV septum in patients with a septal AP.

Methods: In a retrospective analysis of 16 consecutive patients with a septal AP, a VES from the RV apex delivered at the time of His deflection during tachycardia resulted in advancement of the succeeding atrial deflection in 5 patients. We prospectively analyzed the data in a separate group of 12 patients with a septal AP in which a VES was delivered from the RV apex and then from the RV summit at the time of His deflection during tachycardia.

Results: RV apical VES advanced the succeeding atrial deflection in 3 patients and terminated the tachycardia within subsequent atrial depolarization in 2 patients. We prospectively analyzed the data in a separate group of 12 patients with a septal AP in which a VES was delivered from the RV apex and then from the RV summit at the time of His deflection during tachycardia. RV summit VES resulted in a significantly higher diagnostic yield for the presence of a septal AP compared with RV apical VES (83% vs. 46%, P < 0.005). RV summit VES also resulted in a higher diagnostic yield for proof of participation of a septal AP in the tachycardia circuit compared with RV apical VES (50% vs. 18%, P < 0.005). A VES from the RV summit was diagnostic of presence of an AP in all patients with a right-sided septal AP but in only 1 out of 3 patients with a left posteroseptal AP.

Conclusions: A VES during His bundle refractoriness from the RV summit increases the diagnostic yield for both presence of an AP and its participation in the tachycardia circuit with respect to RV apical VES.

Atrial Fibrillation Surgery in Patients With Coronary Artery Disease

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Atrial fibrillation (AF) is known to be a risk factor for quality of life and increased mortality. Patients with coronary artery disease undergoing open heart bypass surgery (CABG) often have associated AF. Is antiarrhythmic surgery in patients undergoing CABG safe and effective and is there a subgroup of patients who will benefit most?

Methods: 52 consecutive patients (15±14 years, age 69±7 years, with chronic permanent AF (11±10 years) underwent CABG (only CABG in 32, CABG plus mitral valve surgery in 20 due to ischamic mitral valve insufficiency) plus additional intraperoperative cooled-tip radiofrequency ablation to treat AF (aortic clamp 98±22 minutes, bypass time 164±11 minutes) treating the left atrium alone in 26 and both atria in 26 patients.

Results: Out of the total of 52 patients 39 converted to stable sinusrhythm (SR) during a mean follow-up of 23±16 months ranking up to a 12-month estimated rhythm-success percentage of 85% (3 months 31 ±44 patients 70%, 6 months 35/44 patients 80%, 12 months 28/36 patients 78%). At 6 months follow-up 79% of patients in SR had documented bicchial contraction. There is no significant difference in rhythm outcome when one or both atria are treated (86% versus 75%, p=0.24). During follow-up up 9 patients died (30-day mortality 8%) ranking up to a cumulative 12-months survival rate of 85%. Patients undergoing CABG procedure alone had a significantly higher survival in short and long term follow-up compared to patients undergoing additional mitral valve surgery (30-day mortality 3% versus 15%, p<0.038; 12-month survival 94% versus 70%, p<0.039). Conversion rates did not differ significantly in between the two groups (74% versus 94%, p=0.31).

Conclusions: Intraoperative cooled-tip radiofrequency ablation in the atria can safely and effectively be added to an open heart surgery in patients with coronary artery disease and the addition procedure is independent to the number of treated (left versus bilateral). Patients with additional mitral valve disease have a worse outcome in regard to survival but not when considering rhythm outcome. In over 60% of these patients an anticoagulation regimen may be stopped.