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**Methods used:** Sixteen patients (9 males, mean age: 60 ± 9 years, LA size: 42 + 5 mm) with PAF (mean duration: 2.6 ± 3.7 years) underwent cryoballoon ablation. After double trans-septal approach with single puncture, one Lasso catheter and a big 28 mm cryoballoon catheter using a steerable sheath were inserted into the left atrium (LA). The 3D TEE technique allowed the anatomo-morphological identification of the PV. Then PV angiography and ostial Lasso recordings from all PVs were obtained. Selective PV angiography and 3 D TEE data were used to evaluate balloon to LA-PV junction contact. CTE ablation lasted 300 s, and the phrenic nerve (PN) was paced during freezing at right-sided PVs.

**Results:** PV identification was achieved in 68/68 (100%) of PVs with the 3D TEE technique, while PVI was achieved in 65/68 PVs (98%). Median procedural and fluoroscopy times were 195 min (120; 240) and 71 min (66; 108), respectively. One transient PN palsy occurred after Right superior PV ablations. No PV stenosis occurred. Total median follow-up time was 186 days (63; 243), and 13 of 16 patients (80%) remained in sinus rhythm (3-month blanking period).

**Conclusions:** Almost all PVs (98%) could be electrically isolated. Real-time 3D TEE provides a novel imaging technique to guide interventions such as cryo-ablation procedures; thus, providing fast and complete information about the underlying anatomo-morphology. CTE is effective and safe technique to treat PAF with high acute success rate.

### 16.4 USEFULNESS OF CONTRAST INTRACARDIAC ECHOCARDIOGRAPHY IN PERFORMING PV BALLOON OCCLUSION DURING CRYO-ABLATION FOR ATRIAL FIBRILLATION

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**Introduction:** Cryoballoon ablation (CBA) has proven very effective for pulmonary vein (PV) isolation (PVI) if complete mechanical occlusion is achieved and conventionally assessed by angiographic injection of contrast within PV lumen. The aim of our study was to assess the usefulness of saline contrast intracardiac echocardiography (CE) in guiding CBA.

**Methods used:** Twenty consecutive patients with paroxysmal atrial fibrillation were assigned to fluoroscopy plus CFD (n = 10; group 1: iodinated medium as both an angiographic and an echographic contrast) versus CE plus CFD (n = 10; group 2: saline contrast) for guidance of CBA. CFD-guidance was used only in pull-down approaches (16% in the study) in both groups.

**Results:** We evaluated 227 occlusion of 71 PVs. CE-guided assessment of occlusion, defined as the loss of echocardiographic back-flow to the left atrium after saline injection regardless of the visualization of PV antrum, showed a high level of agreement with the angiographic diagnosis of occlusion. PVI rate was similar in both groups and effectively guided by CE (PVI using ≤ 2 double cryofreezes: 89% of PVs in gr. 1 vs 91% in gr. 2; P = n.s.). Group 2 patients (CE guidance) had significantly shorter procedure (128 ± 17 minutes vs 153 ± 18; P < 0.05) and flu-

oroscopy times (30 ± 11 minutes vs 42 ± 9, P < 0.05) and used lower iodinated contrast (90 ± 25 mL vs 191 ± 45, P < 0.05).

**Conclusions:** PV occlusion and PVI during cryoablation can be effectively predicted by CE. This technique reduces radiological exposure and iodinated contrast use.

### 16.5 LONG-TERM FOLLOW-UP FOR PAROXYSMAL ATRIAL FIBRILLATION TREATED BY CRYO-BALLOON-CATHETER-ABLATION AND FOCAL RF APPLICATIONS FOR RESIDUAL GAPS UNMASKED BY ADENOSINE, AND GUIDED BY BIDIRECTIONAL BLOCK AS END POINT

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**Introduction:** Since November 2008, 39 patients, 29 male (74.3%) were treated for being recurrently symptomatic and refractory to medical treatment for Paroxysmal Atrial Fibrillation (PAF); they were followed-up until March 2011.

**Methods used:** One hundred fifty-one Pulmonary Veins (PV), including 5 Common Trunks, were treated with the big 28 mm Cryo-Balloon (CB) to achieve their electrical Isolation from the Left Atrium (LA).

A circular duodecapolar 7 F with adjustable diameter catheter was used for cartography and checking LA-PV bidirectional block (BB) was carried out by pacing LA, 600, 500, 400 ms cycle length from Coronary Sinus and PV from the all 20 poles of the circular catheter. It was then repeated after Adenosine (AD) administration (12-18 mgrs.) when complete A-V conduction block occurred.

Residual conduction GAPS (RC) unmasked by AD were eliminated by focal RF applications.

**Results:** Acute BB after AD were achieved in 149 (98.67%) of total PV (151).

Twelve PV (7.9%) showed RC after AD and two extrapulmonary muscular connections. They were all finally abolished by Focal RF applications.

On follow-up (440 ± 261 days), PAF recurred in 3 patients (7.7%) and a second procedure was done.

From the remaining 36, patients 35 (97.2%) are asymptomatic, free of drugs, in Sinus Rhythm.

**Conclusions:** Cryo-Energy PV application does not produce a homogeneous circumferential lesion in all PV. Routine use of AD after acute CB-PV Isolation allows to identify incomplete lesions with dormant tissue, and eliminate them by focal RF applications improving a long-term rate of definitive cure for PAF.

### 16.6 CRYOBALLOON-ABLATION TO TREAT PAROXYSMAL ATRIAL FIBRILLATION USING ELECTROANATOMICAL VOLTAGE MAPPING: WHAT IS THE LEVEL OF PULMONARY VENOUS ISOLATION?

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**Introduction:** Balloon-based technology and cryoenergy were recently introduced to increase the safety of the