

## **Simplified pulmonary vein isolation by a balloon-mounted cryoablation system guided by transesophageal echocardiography.**

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**Background:** Pulmonary vein (PV) isolation using a balloon-mounted cryoablation system is a new technology for the percutaneous treatment of atrial fibrillation (AF). Correct positioning of the cryoballoon in the antrum of the PVs is essential for the safety and efficacy of the procedure. Transesophageal echocardiography (TEE) allows for real time visualization of balloon positioning and successful vein occlusion via color Doppler.

**Objectives:** We hypothesized that PV mechanical occlusion monitored with TEE could predict effective electrical isolation.

**Methods:** We studied 124 PVs in 30 patients with symptomatic AF (23 paroxysmal). Under continuous TEE assessment, a cryoballoon was placed in the antrum of each PV aiming for complete PV occlusion as documented by color Doppler. At the end of the procedure PV electrical isolation was evaluated using a circumferential mapping catheter.

**Results:** Of the 124 PVs studied, 123 (99.2%) could be visualized by TEE: the antrum was completely visualized in 80 of them (64.5%) and partially in 36 (29.0%). In another 7 PVs (5.7%) only disappearance of distal flow could be observed as an indirect sign of complete PV occlusion. Color Doppler documented complete vein occlusion could be achieved in 111 of the 123 (90.2%) visualized PVs. Postinterventional mapping demonstrated electrical isolation in 109 of 111 occluded PVs (positive predictive value 98.2%) and only in 1 of 12 non-occluded PVs (negative predictive value 91.7%,  $p < 0.001$ ). Transient loss of phrenic nerve conduction was the only complication observed in 4 patients. After a mean follow-up of  $7.4 \pm 3.7$  months, 73.3% of patients remained in sinus rhythm without antiarrhythmic drugs.

**Conclusion:** Color-Doppler documented PV occlusion during cryoballoon ablation can predict effective electrical isolation.