

Long-Term Experience in Cryoisolation of Pulmonary Veins With Balloon Technique in Paroxysmal Atrial Fibrillation

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Background: In the treatment of paroxysmal atrial fibrillation (af) circumferential substrate modification of the antrum of pulmonary veins (pv) seems superior in comparison to segmental methods. However, with radiofrequency energy, a risk of pv stenoses and esophago-left atrial fistula exists. This study reports on the long-term experience in isolating pv ostia and parts of the antrum with the cryoballoon technique.

Methods: After pv angiography isolation was performed with best fitting 28/23mm balloon (Arctic Front, Cryocath, Canada). The inflated over the wire balloon occluded the venous ostium and parts of venous antrum freezing down to -75°C 6 minutes two times per vein with nitrous oxide. Lasso mapped rest potentials were eliminated with additional balloon freezes or 9 french Freezor Max catheter. Patients (p) were followed three monthly with 7-day Holter.

Results: We treated 147 p (45 women, mean age 59 ± 10 years, 136 with paroxysmal, 11 persistent af, left atrium 42 ± 5 mm, 65 with lone af, 59 hypertension, 23 mild structural heart disease) with 23/28 mm balloon. Mean vein diameter was 18 ± 4 mm angiographically. With a mean number of 2.4 ± 0.7 impulses we isolated up to 87% of the left pv and the right upper pv and 82 % of the right lower pv with balloon only; in the last 40 p all 4 pv with balloon only could be isolated! In 30% we combined 23/28 mm balloon. We isolated 100% of all pv during a procedure time of 185 ± 38 min with x ray burden of 35 ± 9 min. Phrenic nerve palsy in 6 p recovered within 3 to 9 months. During a mean follow-up of 8.5 months and 1.1 procedures per p (12 redos) of 96 p controlled with serial 7-day holter and symptoms 78 % (75 p) were free of af. 16 showed marked reduction of af burden. In the 12 redos 68 % of the 37 reconducting veins were initially isolated with the 28 mm balloon.

Conclusions: Cryoisolation of ostia and antrum of the pv with balloon technique is safe and shows a convincing outcome in long term experience. The superiority in comparison to substrate modification with RF will be an early and first line therapy of left atrial disease. Avoidance of phrenic nerve lesion and focus on improvement of balloon design may be essential.

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