

Long-term results in antral isolation of pulmonary veins with cryoballoon technique in paroxysmal atrial fibrillation

Vogt (Bad Oeynhausen /Germany), Dorszewski (Bad Oeynhausen /Germany), Heintze (Bad Oeynhausen /Germany), Wetzel (Bad Oeynhausen /Germany), Scholz (Bad Oeynhausen /Germany), Muntean (Bad Oeynhausen /Germany), Luong Thanh (Bad Oeynhausen /Germany), Horstkotte (Bad Oeynhausen /Germany)

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, radiofrequency energy is associated with a risk of pv stenoses and esophago – left atrial fistulas. This study reports on the long-term experience in antral isolation of pv with cryoballoon technique in a large patient cohort.

Methods: After pv angiography isolation was performed with best fitting 28/23mm balloon (Arctic Front, Cryocath, Canada).The inflated over the wire balloon occludes the 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 due to touch up with a 9 french Freezor Max catheter. Patients were followed every 3 months with 7-day holter.

Results: Out of more than 200 patients (p) we analysed the first 161 p (45 women, mean age 59 ± 10 years, 149 with paroxysmal, 12 persistent af, left atrium 42 ± 5 mm, 72 p with lone af, 65 hypertension, 24 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 applied in 113 p (70%), we isolated all pv with balloon only, in 30% with additional touchup. In the last 55 p all pv could be isolated with balloon only. In 33% we had to combine 23/28 mm balloon. Over time mean procedure time decreased to 164 ± 31 min and x ray burden to 29 ± 9 min. Phrenic nerve palsy in 7 p (4%) recovered within 3 to 9 months. During a mean follow-up of 10.7 months and 1.1 procedures per p (12 redos) of 120 p controlled with serial 7-day holter and symptoms, 72% (86 p) were free of af. 29 out of the remaining 34 p showed a marked reduction of af burden, an overall clinical success of more than 95%. In the 12 redos 77% of the 35 reconducting veins were initially isolated with the 28 mm balloon.

Conclusion: Antral cryoisolation of the pv with the 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.