

Long-term Success and Side Effects of Antral Isolation of Pulmonary Veins with Cryoballoon Technique in a Large Patient Cohort With Atrial Fibrillation.

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Background: In treatment of paroxysmal atrial fibrillation (af) circumferential substrate modification of the antrum of pulmonary veins with radiofrequency energy includes risks of pv stenoses and esophageal – left atrial fistula. This study reports on 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 during the beginning due to touch up with a 9 french Freezor Max catheter. To avoid phrenic nerve palsy movement of right diaphragm or pacing of phrenic nerve were monitored. Patients were followed three monthly with 7 day holter.

Results: Out of more than 270 patients (p) we analysed the first 251 p (79 women, mean age 59 ± 10 years,233 with paroxysmal,18 persistent af,left atrium 43 ± 5 mm,118 p with lone af,93 hypertension,40 mild structural heart disease, history of af 77 ± 67 months). With a mean number of $2,4\pm 1,2$ impulses we isolated in 201 p (80%) all pv with balloon only,in 20 % with additional touch up. In the last 145 p all pv could be isolated with balloon only. In 44 % we combined two balloon sizes.O ver time mean procedure time decreased to 164 ± 31 min and x ray burden to 26 ± 7 min. Phrenic nerve palsy in 8 p (4%,7 with 23 mm balloon) recovered within 3 to 9 months. Since we used pacing technique to monitor phrenic nerve function in more than 100 patients damage of phrenic nerve could be avoided completely. During a mean follow up of 8.5 ± 6 months and 1.1 procedures per patient (23 redos) of 168 patients controlled with serial 7 day holter and symptoms after blanking time of 3 months 81 % (136 p) were free of af, with one procedure 72%, in p with left common ostia (11 of 13) 85%. 5% of the remaining patients showed a marked reduction of af burden, overall a clinical success of more than 85 % without significant difference isolating left common ostia. Success rate in persistent af was very low (36%)No pv stenoses,no fistulas were observed. Other side effects were 3 groin hematomas, 2 additional substrate modifications of left atrium and 7 later ablations of typical atrial flutter.

Conclusion: Antral cryoisolation of the pv with cryoballoon technique is safe. With pacing technique persistent phrenic nerve palsy can be avoided completely. Success rate is comparable, risks of side effects are superior to encircling techniques of pv antrum with RF energy, which should be the method of choice in p with persistent af. Early cryoballoon therapy may prevent progression to persistent af.