

Poster presentation

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Cardiac MRI allows evaluation of different ablation techniques in patients undergoing pulmonary vein ablation

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from 13th Annual SCMR Scientific Sessions
Phoenix, AZ, USA. 21-24 January 2010

Published: 21 January 2010

Journal of Cardiovascular Magnetic Resonance 2010, **12**(Suppl 1):P55 doi:10.1186/1532-429X-12-S1-P55

This abstract is available from: <http://jcmr-online.com/content/12/S1/P55>

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Background

Pulmonary vein antrum isolation (PVAI) is regarded as an alternative therapy in atrial fibrillation (AF) patients. Dreaded complications of PVAI are pulmonary vein stenoses, which might be influenced by the applied ablation technique and material. Cardiac magnetic resonance imaging (CMR) has been introduced as a new tool for evaluation of ablation results.

Methods

20 patients (14 male, $63,1 \pm 9,1$ y) with paroxysmal AF were included. 10 patients underwent PVAI with radiofrequency ablation (RFA), whereas the others received ablation with Cryoballoon (CBA). All patients were scheduled for CMR (Espree 1.5 T, Siemens, Germany) before, acute, and 24 hours after PVI. For pulmonary veins, cross sectional diameter, angiography of pulmonary veins and flow measurements of the right inferior pulmonary vein (RIPV) were performed.

Results

In RFA patients, RIPV diameters significantly decreased during, and re-increased 24 h after PVI. RIPV blood flow significantly increased during, and slightly increased after intervention (Table 1). Also, pulmonary congestion and pleural effusion, which occurred acutely during PVI were recurrent after 24 h. Patients undergoing PVAI with Cryoballoon has no significant changes in parameters or signs of deterioration.

Summary

Patients undergoing RFA suffered from reversible pulmonary vein stenosis by edema of the tissue, pulmonary congestion and pleural effusion, whereas patients undergoing CBA seemed to have no relevant deterioration early after PVAI. The choice of ablation technique and material seemed to determine the occurrence of complications, which could be reliably detected and evaluated by CMR. Thus, CMR might be used for evaluation of different ablation techniques in patients undergoing PVAI.

Table 1:

	Before PVAI	Acute after PVAI	24 hours after PVAI
RFA			
RIPV Diameter (mm)	11.7 ± 1.83	9.1 ± 2.42*	11.2 ± 2.66^
Flow (cm/s)	34.28 ± 13.97	42.46 ± 13.99°	46.74 ± 13.87^
CBA			
RIPV Diameter (mm)	11.3 ± 2.94	12.0 ± 3.09°	12.6 ± 3.78#
Flow (cm/s)	42.89 ± 11.91	35.98 ± 9.56°	34.7 ± 12.07#

*before vs. acute p < 0.05 ^acute vs. 24 h after p < 0.05

° before vs. acute p = n.s.# acute vs. 24 h after p = n.s.

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