Donnerstag, 16. April 2009 (Posterbereich B) 09:30-11:00

Postervorträge

- Katheterablation von Vorhofflimmern – Neue Technologien

Diskussionsleiter: T. Meinertz (Hamburg), C. Schmitt (Karlsruhe)

Acute Efficacy of a Novel Circular Multielectrode Radiofrequency Ablation Catheter for Pulmonary Vein Isolation: an Anatomic Analysis Using 3-D CT Reconstruction of the Left Atrium

M. Brunelli[1], S. Raffa[1], A. Große[1], F. Regoli[1], J. C. Geller[1]

[1]Abt. für Rhythmologie und invasive Elektrophysiologie, Zentralklinik Bad Berka GmbH, Bad Berka;

Background: Pulmonary vein isolation (PVI) is the standard ablation strategy in paroxysmal atrial fibrillation (AF). In order to reduce procedure and fluoroscopy times, novel ablation tools have recently been introduced.

Aim: To assess the acute efficacy of a new low energy phased radiofrequency circular multielectrode ablation catheter (Pulmonary Vein Ablation Catheter™ [PVAC], Ablation Frontiers, Carlsbad, CA, USA) in isolating the pulmonary veins (PVs) and its relation to PV anatomy.

Methods and Results: A total of 50 patients (pts) (52% males, mean age 61.7 ± 9.8 yrs, NYHA class 1.3 ± 0.6, CHADS2 score 1.2 ± 1.1, LVEF 58 ± 6.9%, LA diameter 39.1 ± 6 mm) with paroxysmal AF referred for catheter ablation were included in this analysis. A multi slice computed tomography was obtained prior to ablation in order to reconstruct a 3-D left atrial anatomy. Maximum and minimum diameters of all PVs ostia as well as the PV ostium area were measured using the VerismoTM software of the NavX, EnSite system (St. Jude Medical, St Paul, MN, USA). PV ostium shape was defined based on the ratio between the maximum and the minimum PV ostium diameter (round =1.2, oval >1.2 and =1.4, flat >1.4). A total number of 197 PV ostia were characterized (Table 1). PVI was performed using the PVAC, and PVs were considered isolated by demonstration of entry and exit block at rest and after adenosine challenge. In case of failure in isolating the vein with the PVAC, a 4 mm irrigated tip catheter was used to complete the isolation. PVI was achieved in 40 pts (80%) and in 185 PVs (94%) with PVAC alone. All left common PVs (LCPV), left common PV antra (LCPVa) and right middle PVs (RMPV) were successfully isolated with PVAC alone. However, some of the PV could not be isolated with the PVAC: left superior n=4 (11%), left inferior n=2 (5%), right superior n=2 (4%), and right inferior n=4 (8%), and although the sample size is small, there was a trend towards bigger areas in superior veins that could not be isolated (Table 2a). No major differences in terms of shape as expressed by the diameter ratio were found between isolated and not-isolated veins (Table 2b).

Conclusions: The PVAC is able to achieve pulmonary vein isolation in the majority of PVs with different anatomic characteristics. The PV ostium diameters, area and shape do not seem to represent a limiting factor for the efficacy of this novel ablation catheter. Transseptal puncture site or PV uptake might contribute, in selected cases, to poor catheter contact and hence to difficulty in achieving PVI.

Table 1.

	LSPVo (n= 38)	LIPVo (n= 38)	LCPVo (n=7)	LCPVa (n= 5)	RSPVo (n= 50)	RIPVo (n= 50)	RMPVo (n= 9)
Major diameter (mm)	19.1 ± 3.1	16.4 ± 2.2	30.9 ± 4.4	33 ± 3.9	20 ± 3.4	18 ± 3.2	9.6 ± 2.2
Minor diameter (mm)	13.9 ± 3	11.4 ± 2.9	16 ± 2.5	15.8 ± 2.2	16.1 ± 3.1	15.9 ± 2.6	8.3 ± 1.7
Area (cm^2)	2.1 ± 0.7	1.5 ± 0.5	3.8 ± 0.8	3.9 ± 1.3	2.5 ± 0.8	2.3 ± 0.7	0.7 ± 0.3
Diameter Ratio	1.4 ± 0.3	1.5 ± 0.4	2 ± 0.4	2.1 ± 0.2	1.3 ± 0.2	1.1 ± 0.2	1.2 ± 0.2
Shape (round/oval/flat) (%)	26/29/45	24/29/47	0/0/100	0/0/100	53/30/17	72/26/2	71/15/14

Table 2a.

Area (cm2)	Successfully Isolated	Not-Successfully Isolated
LSPVo	2 ± 0.5	3.2 ± 1.3
LIPVo	1.5 ± 0.5	1.5 ± 0.4
RSPVo	2.5 ± 0.8	3.2 ± 0.5
RIPVo	2.2 ± 0.7	2.4 ± 0.9

Table 2b.

Diameter Ratio	Successfully Isolated	Not-Successfully Isolated
LSPVo	1.4 ± 0.3	1.5 ± 0.3
LIPVo	1.5 ± 0.3	1.4 ± 0.4
RSPVo	1.2 ± 0.2	1.3 ± 0.2
RIPVo	1.1 ± 0.2	1.2 ± 0.2