

Results Of Cryoballoon And Laser Ablation Of AF

Characteristics Of The Left Atrium-Pulmonary Vein Reconductions In The Clinical Recurrences Of Paroxysmal Atrial Fibrillation In Patients Initially Treated With The Cryoballoon Catheter Technique

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Abstract

Introduction: Cryo-balloon catheter ablation technique (CB) has demonstrated been useful to treat patients with paroxysmal atrial fibrillation (PAF).

We analyzed the anatomic-electrophysiological characteristics of the residual gaps in 4 segments (Sup. Inf. Ant. Post.) of the veins (PV) showed in the first procedure (FP) and their correlation with the clinical recurrence of PAF and the locations of the LA-PV reconductions demonstrated in a second procedure (REDO).

Methods: We analyzed 278 PV from 72 patients initially treated with CB. Artic Front Cryocath 28 mm and mapped with a 20 poles circular catheter at the LA-PV junction level. Complete electrical isolation with bidirectional block (BB) and after adenosine was demonstrated in all PV (100%) at the FP with a mean temperature occlusion reached $\geq -50^{\circ}\text{C}$.

Results: A total of 36 PV (13%) reconducted in the FP with a different segment location; all finally abolished by focal RF applications.

In a follow-up of 777 ± 454 days, 10 patients (13.8 %) had clinical recurrences. 8 (11%) at 4, and 1 (1.4%) at 10, 1 (1.4%) at 40 months respectively after the FP, and 8 (80%) were REDO. No significant (NS) differences were found related with the LA or PV size in the recurrence group versus no recurrence.

From the 31 PV of the 8 REDO patients: 16 reconducted (51.6%): LSPV 6 cases (75%), LIPV 3 (37.5%), RSPV 2 (25%), RIPV 4 (50%) and 1 (12.5%) common trunk (CT) respectively. Four REDO patients (50%) showed reconduction in the FP in a different segment location, and one in all segments.

Conclusion: Cryo-energy applications with CB doesn't produce a homogeneous circumferential lesion in all PV, which is probably related to several factors, including: 1) Small LA-CB contact area at the PV-LA junction level. 2) LA and PV wall thickness and size. 3) The histological characteristics of the cryo-induced tissue lesion, resulting in aleatory reconductions in any segment of the vein not related with the residual conduction location showed in the FP.

The highest conduction rate was found at the LSPV.

As all clinical recurrences occurred late, we probably might expect a higher reconduction rate in a more long-term follow-up.

CLINICAL RECURRENCES

NO RECURRENCES 52±12 (Mean / Diameters)				N.S.				46 range (25-86) 72.22 (Mean / Diameters)			
L.A. (mm)		P.V. (mm)		L.A. (mm)		P.V. (mm)		L.A. (mm)		P.V. (mm)	
AP	37±6	SI	20±4	AP	37±6	SI	18±3	LAT	49±10	AP	19±6
LAT	48±8	AP	18±4	SI	53±7	-	-	SI	53±7	-	-
SI	55±7	-	-	RECONDUCTION FIRST PROCEDURE				REDO PROCEDURE			
PV				AFTER ADENOSINE				REDO PROCEDURE			
BASAL SEGMENTS				AFTER ADENOSINE				REDO PROCEDURE			
SEGMENTS				AFTER ADENOSINE				REDO PROCEDURE			
	S	I	A	S	I	A	S	I	A	P	
LS	-	-	-	1	1	-	3	3	2	1	
LI	1	-	1	1	1	3	2	1	1	2	
RS	-	-	3	-	-	1	1	2	1	1	
RI	1	2	1	6	1	2	4	2	3	2	
CT	-	-	-	-	-	-	1	1	-	-	