

October 2013

Special Issue

JAFIB

Journal of Atrial Fibrillation

VENICE 2013 ARRHYTHMIA

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Extrapulmonary Muscular Connections As A Potential Cause Of Left-Atrium-Pulmonary Vein Reconductions After Apparently Complete Electrical Pulmonary Veins Isolation In Patients Treated For Atrial Fibrillation With The Cryoballoon Technique

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Abstract

Introduction Cryo-balloon technique (CB) for electrical isolation of pulmonary veins (PV) from the left atrium (LA) is a useful tool to treat patients with atrial fibrillation (AF). Limitations include the impossibility to eliminate extrapulmonary muscular connections (EMC), potential cause of PV-LA reconduction.

We analyzed the incidence of EMC in our patients treated with the CB.

Methods: A total of 326 PV from 84 patients with paroxysmal atrial fibrillation (PAF) (72), and persistent (AFP) (12) were treated with the big 28 mm CB, and acute electrical isolation achieved.

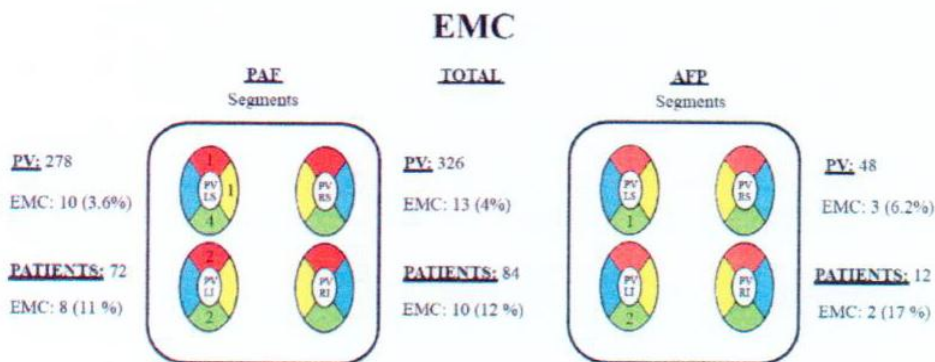
A 20 poles circular-catheter mapping (CC) was used for cartography, and checking for bidirectional block (BB) performed.

Antral pacing at the PV-LA junction level, and LA at distal CS was performed in a sequential manner from all the 20 poles of the CC at 3 different CL (600, 500, 400 mS), repeated after adenosine and pacing distal into the vein.

Results: A

Conclusions: The only not evidence of PV electrical activity after CB ablation, neither the demonstration of BB at the antral level is not enough to assure complete PV-LA isolation, and pacing distal PV from the 20 poles of the CC is mandatory to perform, to rule out such a potential cause of PV reconduction.

EMC cannot be eliminated by the CB, representing by themselves a significant percentage of potential reconduction in patients with PAF (11%) and 17% (AFP), which ones, by the contrary, once identified, can be easily eliminated by RF focal applications.



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 anatomo-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	LAT	49±10	AP	19±6	SI	53±7	-	-
SI	55±7	-	-	SI	53±7	-	-				
RECONDUCTION FIRST PROCEDURE				AFTER ADENOSINE				REDO PROCEDURE			
PV		BASAL SEGMENTS		PV		BASAL SEGMENTS		PV		BASAL SEGMENTS	
		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	-	-



Oral Communications

OC

11.00-13.00

RESULTS OF CRYOBALLOON AND LASER ABLATION OF AF

Chairmen: M. Del Greco / Trento, Italy - J.B. Chierchia / Brussels, Belgium

Characteristics of the left atrium-pulmonary vein reconductions in the clinical recurrences of paroxysmal atrial fibrillation in patients initiallu treated with the cryoballoon catheter tecnique

J.M. Paylos, C. Ferrero, J.R. Conesa, M. Rayo, A. Morales, V.G. Tello / Madrid, Spain

Extrapulmonary connections as a potential cause of left-atrium-pulmonary vein reconductions after apparently complete electrical pulmonary veins isolation in patients treated for atrial fibrillation with the cryoballoon technique

J.M. Paylos, C. Ferrero, J.R. Conesa, A. Morales, M. Rayo, M.A. Gómez, V.G. Tello / Madrid, Spain

Technical evolution of cryoballoon pulmonary vein isolation in patients with paroxysmal atrial fibrillation – First experience with the new artic front advance© cryoballoon

S. Hoenig, A. Kypta, T. Lambert, K. Saleh, C. Steinwender / Linz, Austria

Coollop first: a first in ,an study to test a novel circular cryoablation system in paroxysmal atrial fibrillation

M. Stuehlinger, S. Hoenig, K. Spuller, C. Koman, O. Pachinger, C. Steinwender / Innsbruck, Austria

Adenosine testing after endoscopic ablation system (EAS) pulmonary vein ablation for atrial fibrillation

N. Kumar, Y. Blauw, L. Pison, R. Ter Bekke, K. Vernooy, C. Timmermans, H. Crijns / Maastricht, The Netherlands

Retrospective comparison of the learning curves for PVI between Cardiofocus laser balloon and PVAC

D.Q. Nguyen, L. Lichtenberg, K. Schuettler, W. Fehske / Cologne, Germany

