

		Total N	N of Events	Censored		p
				N	Percent	
AFRPS≤2.55	PVI	708	179	529	74,7%	.317
	PVI+RL	41	14	27	65,9%	
	Overall	749	193	556	74,2%	
AFRPS>2.55	PVI	338	178	160	47,3%	.005
	PVI+RL	91	34	57	62,6%	
	Overall	429	212	217	50,6%	

LATE CLINICAL RECURRENCES OF ARRHYTHMIA IN PATIENTS TREATED FOR ATRIAL FIBRILLATION WITH THE CRYO-BALLOON CATHETER ABLATION TECHNIQUE. TEN YEARS EVOLUTIVE ANALYSIS. A SINGLE CENTER REPORT

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INTRODUCTION Cryo-Balloon Catheter Ablation Technique (CB) has been proven in the last decade to be effective and safe to treat patients (pts) with Atrial Fibrillation (AF) by achieving complete circumferential electrical isolation of the pulmonary veins (PV) from the Left Atrium (LA).

However a significant rate of early clinical recurrences has been described mostly because of LA-PV reconnection. We retrospectively analyzed in a large ten years follow-up of our serie of pts treated for Paroxysmal (PAF) or Long Standing Persistent Atrial Fibrillation (LSPAF) with CB, the incidence and characteristics of the late clinical recurrences of the arrhythmia.

METHODS Since November 2008 to April 2019, a total of 371 pts (267 male / 104 female) suffering AF (225 PAF / 146 LSPAF) were referred to our Institution and treated with CB to achieve the electrical Isolation of their PV from the LA in a attempt to cure the arrhythmia.

Late recurrence was defined by the appearance of the clinical arrhythmia one year after the three months “Blanking Period” on medication, and supported by the clinical manifestation of pts, along with full ECG documentation of the arrhythmia, lasting more than 10 minutes on a stable stage.

RESULTS In this ten years of retrospective analysis 23 pts (6.2%) (mean age 56±12; 20 male / 3 female) meet the full criteria previously described to be consider as “Late Clinical Recurrence”.

None pts had structural heart disease. Initial time of the know arrhythmia was 4.5±4 years (1-15). Seventeen pts (7.5%) in the group of PAF (mean age 57±12 (31-75) 14 male /3 female) Versus 6 pts from the group of LSPAF, all man (mean age 64±6 (57-62)) Late recurrence appearance time: 27±14 month (16-50).

All pts were submitted for a new “review” CB procedure (RCB).

In the group of PAF 14 pts (82.5%) out of 17 showed PV reconnection and 50% in the group of LSPAF (3 out of 6 pts).

Six pts with PAF showed Left Common Trunk (LCT) reconnection (42.8%).

Two pts with LSPAF showed LCT reconnection (33.3%).

Gender male incidence was higher in the group of PAF 64.7%, and 100% in the group of LSPAF. Hypertension was a risk common factor associated with clinical recurrences in pts with PAF and complete electrical isolation of their PV demonstrated.

First Generation CB1 was used only in 50% of pts with recurrence PAF. On follow-up of 28±23 months (9-69) after RCB, 7 PAF pts (41.2%) remain in sinus rhythm (SR) with no medication, 3are still on “Blanking Period”, and in the other 4, the arrhythmia

recurred again. In LSPAF group, 3 pts (50%) with clinical recurrence and PV isolated, remain in SR on medication; the other 3 pts, the arrhythmia recurred again with PV isolated, remaining in SR on medication.

Morphological and structural data are show in Table.

CONCLUSIONS

- 1- The most important cause of clinical arrhythmia recurrence after CB is the LA-PV reconnection (82.5%) in pts with PAF.
- 2- Hypertension is associated with a higher rate of recurrence, even in pts with complete electrical isolation of their PV demonstrated.
- 3- LA-PV reconnection and atrial remodeling process play a similar role in the recurrence of the clinical arrhythmia in pts suffering LSPAF.

Table.

Morphological and structural data.

		LA	PV	LCT	RCT	LVEF	
PAF 17pts	Diameters (mm)		62	6	0		
	AP	39±5 (29-47)	20±3 (14-26)	25±5 (19-31)		68±8%	(55-76)
	SI	51±5 (43-60)	21±4 (12-27)	30±3 (28-35)			
	LAT	40±5 (31-47)					
	LA/AREA					20±3 (15-24)	
	PER 6pts	Diameters (mm)	LA	PV	LCT	RCT	LVEF
AP	43±4 (40-50)		22±4 (14-28)	28±4 (25-31)	33	66±5%	(60-70)
SI	56±5 (50-62)		21±3 (14-27)	35±2 (34-37)	34		
LAT	43±7 (33-49)						
	LA/AREA					24±5 (17-30)	

LTC: Left Common Trunk

RCT: Right Common Trunk

LVEF: Left Ventricular Ejection Fraction

LA: Left Atrial

PV: Pulmonary Veins

PAF: Paroxysmal Atrial Fibrillation

PER: Persistent Long Standing Atrial Fibrillation

TEN YEARS OF CRYO-BALLOON CATHETER ABLATION TREATING PATIENTS WITH ATRIAL FIBRILLATION. LONG TERM RESULTS. CLINICAL RECURRENCES AND COMPLICATIONS A SINGLE CENTER REPORT

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INTRODUCTION The electrical disconnection of the pulmonary veins (PV) from the left atrium (LA) by Cryo-Balloon ablation (CB), has proven effective and safe to treat patients (pts) with atrial fibrillation (AF). We

retrospectively analyzed our ten years follow-up experience with this method in terms of results, clinical recurrences, complications and collateral damages. **METHODS** Since November 2008 to August 2018, a cohorte of 333 pts, suffering Paroxysmal (PAF) or Persistent (PER) AF (199 vs 134 pts), 143 M (56±13 years) / 56 F (63±10 years) versus 100 M (63±9 years) / 34 F(67±6 years) were treated with CB. Follow-up period 57±31 months. Until April 2013 all pts were treated whit the first generation CB (CB1) and hereafter with de second generation CB (CB2) (74 CB1, 112 CB2 with PAF, and 15 CB1, 113 CB2 with PER).

Morphological and structural data are shown in Table.

RESULTS A total of 1215 PV, including 117 common trunks (CT) were treated with CB and electrical disconnection from the LA demonstrated in 1158 PV (95.3%). Acute reconnection presented 57 PV (4.7%) with 16 Extrapulmonary Muscular Connections (EMC). Complications and Collateral Damages: Aphonia: 12pts, (3.6%). Persistent phrenic nerve paralysis: 2 (0.6%). Transient phrenic nerve paresia: 28 (8.4%). Dyspepsia: 2 (0.6%). Bronchospasm: 2 (0.6%). Hemoptysis: 4 (1.2%). ST segment elevation: 17 (5%). Transient prolonged asystole: 3 (0.9%).

Complications: No major complications or side effects occurred, with no mortality, none atrioesophageal fistula, and none PV stenosis. Minor complications, related with the vascular access included: Inguinal haematoma: 15pts (4.5%), Arteriovenous fistula; 1 pts (0.3%), Femoral arterial pseudoaneurism: 3 pts (1%).

On Follow-up (after 3 months blanking-period) 265 pts (80%) remain asymptomatic after a single procedure, in sinus rhythm, with no medication. Sixty eight pts (20.5%) (31 PAF / 37 PER) presented clinical recurrence: Early 17%, and Late 6.4%, and a second procedure (REDO) was done. Reconnection was showed in 46 REDO pts. (26 PAF/ 22 PER), in which 6 of them, reconnection was presented at first procedure, in a different segment location. On a 52±25 months period of REDO follow-up pts, all pts remain in sinus rhythm, with no medication.

CONCLUSIONS CB technique is very effective and safe for the definitive treatment of AF, with 98% of pts free of arrhythmia at 10 years, with no medication for the group of PAF, and 63% of pts for the group with PER at 6 years of follow-up respectively.

Table.
Morphological and structural data.

	LA	PV	LCT	RCT	LVEF	
	Diametres (mm)	730	57	9		
PAF 199pts	AP	37±6 (21-50)	21±4 (8-32)	27±4 (17-35)	29±3 (20-33)	67±5% (56-77)
	SI	52±7 (22-75)	22±3 (10-28)	26±4 (17-34)	27±3 (27-29)	
	LAT	44±7 (27-61)				
		LA/AREA(cm ²) 21±4 (11-32)				
With structural Heart Disease (19 pts)						
PER	Diameters(mm) LA	PV	LCT	RCT	LVEF	
	AP	65	10	1		
	SI	22±4 (16-32)	27±9 (25-31)	33	58±6% (48-70)	
	LAT	20±5 (11-28)	30±5 (22-5)	34		
	44±5 (21-60)					
	LA/AREA (cm ²) 26±5 (14-33)					
Without Structural Heart Disease (115pts)						
PER	Diameters(mm) LA	PV	LCT	RCT	LVEF	
	AP	420	32	8		
	SI	22±4 (9-32)	26±4 (18-33)	27±1 (22-32)	65±7% (48-70)	
	LAT	22±3 (9-28)	30±4 (20-37)	26±1 (22-35)		
	43±8 (17-69)					
	LA/AREA (cm ²) 23±4 (13-29)					

LTC: Left Common Trunk
 RCT: Right Common Trunk
 LVEF: Left Ventricular Ejection Fraction
 LA: Left Atrial

PV: Pulmonary Veins
 PAF: Paroxysmal Atrial Fibrillation
 PER: Persistent Long Standing Atrial Fibrillation