



# JACC

## Clinical Electrophysiology

### JACC: Clinical Electrophysiology

Volume 3, Issue 10 Supplement, October 2017 DOI: 10.1016/j.jacep.2017.09.044  
[PDF Article](#)

#### 073\_16735-H5 Reverse Electrical Remodeling Induced by Sinus Rhythm and Calcium Channel Blockers May Play a Role for Better Long-Term Follow-Up Results in Patients With Long Standing Persistent Atrial Fibrillation and Treated With Cryo-Balloon Ablation

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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 to treat patients (pts) with atrial fibrillation (AF). However the results significantly differ from paroxysmal to persistent, and several factors related with the atrial remodeling process play an important role on this. AF causes electrical remodeling, and chronic AF led to shortening of the atrial effective refractory period (AERP), and to loss of its physiological rate adaptation, which could make atria more vulnerable to fibrillation. Human and experimental studies have demonstrated that electrophysiological changes are influenced by intracellular calcium overload, and verapamil (VP), but not other antiarrhythmic drugs (ADD) could markedly attenuate this effect. According with the aforementioned, we sought to achieve electrical atrial stabilization with VP after cardioversion (CV) 3 months before CB-PV ablation in patients with long standing persistent atrial fibrillation (LSPAF).

#### Methods

Sixty nine pts, 56 male (61±10 mean age) were treated for LSPAF. 54 with the second generation CB and PV isolation demonstrated. The mean time duration of stable arrhythmia was 5±5 years (2-24). All previously treated with AAD. Mean LA size: 42±6 mm. After CV, electrophysiological evaluation pre and post 0.15 mgr/Kg body weight of VP was done and the AERP at 500 ms pacing CL measured. Criteria of exclusion for CB-PV ablation included: left atrial size ≥ 50mm, and failed CV to reverse AF. After 3 months blanking period on AAD, PV complete electrical isolation was achieved with CB, and a mean period follow-up duration of 42.6 months (4±2 years), analyzed.

#### Results

Mean AERP increased from 205±16 to 237±16 ms (p≤0.05) after VP. Forty six pts (66%) maintain SR without AAD after a single procedure. AF recurred in 23 pts (33%) who were given AAD: 9 pts refused a second procedure (REDO) and remain in AF. In the remaining 14, sinus rhythm (SR) was restored with AAD and were REDO. In a mean REDO follow-up of 30±20 months, all 14 REDO pts remain in SR (4 on AAD). After REDO, 60 pts (87%) remain in SR.

#### Conclusions

Reverse atrial electrical remodeling induced by SR + VP 3 months before CB-PV ablation can select LSPAF pts for CB-PV isolation with better long term outcomes.

Table 1: Baseline characteristics of study population (n=67)

Age (median, IQR)	59 (51-65)
Female gender (n, %)	21 (31%)
BMI (median, IQR)	26 (24-28)
CHA <sub>2</sub> DS <sub>2</sub> -VASc score (median, IQR)	1 (0-2)
Hypertension (n, %)	33 (49%)
LVEF in % (median, IQR)	61 (60-61)
LAVI in mL/m <sup>2</sup> (median, IQR)	33 (26-40)
Paroxysmal/persistent AF (n, %)	60/7 (90%/10%)
Months since AF diagnosis (median, IQR)	55 (30-101)
Months between procedures (median, IQR)	9 (5-16)

IQR = interquartile range; BMI = body mass index; LVEF = left ventricular ejection fraction; LAVI = left atrial volume index; AF = atrial fibrillation

Table 2: AF recurrence after one and two year follow-up

AF-recurrence after 1 year	20 (30%)
Holter monitoring	7 (10%)
Clinical presentation	16 (24%)
AF-recurrence after 2 years	23 (37%)
Clinical presentation	22 (33%)

**CONCLUSION** Cryoballoon redo procedures after a first cryoballoon ablation have acceptable long-term success rates. Additional studies with systematic clinical follow-up in addition to protocol driven Holter monitoring are warranted to compare the efficacy of cryo redo procedures with radiofrequency ablation.

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**Reverse Electrical Remodeling Induced by Sinus Rhythm and Calcium Channel Blockers May Play a Role for Better Long-Term Follow-Up Results in Patients With Long Standing Persistent Atrial Fibrillation and Treated With Cryo-Balloon Ablation**

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**METHODS** Sixty nine pts, 56 male (61±10 mean age) were treated for LSPAF, 54 with the second generation CB and PV isolation demonstrated. The mean time duration of stable arrhythmia was 5±5 years (2-24). All previously treated with AAD. Mean LA size: 42±6 mm. After CV, electrophysiological evaluation pre and post 0.15 mg/Kg body weight of VP was done and the AERP at 500 ms pacing CL measured. Criteria of exclusion for CB-PV ablation included: left atrial size ≥ 50mm, and failed CV to reverse AF. After 3 months blanking period on AAD, PV complete electrical isolation was achieved with CB, and a mean period follow-up duration of 42.6 months (4±2 years), analyzed.

**RESULTS** Mean AERP increased from 205±16 to 237±16 ms (p≤0.05) after VP. Forty six pts (66%) maintain SR without AAD after a single procedure. AF recurred in 23 pts (33%) who were given AAD: 9 pts refused a second procedure (REDO) and remain in AF. In the remaining 14, sinus rhythm (SR) was restored with AAD and were REDO. In a mean REDO follow-up of 30±20 months, all 14

REDO pts remain in SR (4 on AAD). After REDO, 60 pts (87%) remain in SR.

**CONCLUSIONS** Reverse atrial electrical remodeling induced by SR + VP 3 months before CB-PV ablation can select LSPAF pts for CB-PV isolation with better long term outcomes.

### 073\_16230

**Recurrence Of Atrial Fibrillation After Cryoablation During The Blanking Period Is A Strong Predictor For Long Term Recurrence**

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**INTRODUCTION** The term blanking period refers the initial 3 months post radiofrequency ablation (RFA) when early recurrence (ER) of atrial tachyarrhythmias can be ascribed to the temporary inflammatory and proarrhythmic changes that occur in the atrium post procedure and do not necessarily predict late recurrence (LR) of atrial arrhythmias. The 2007 expert consensus statement endorses implementing a blanking period for the first 3 months after RFA for atrial fibrillation (AF). A few studies have shown that ER post cryoablation may be predictive of LR but it is not generally accepted. We hypothesized that the use of cryoenergy is far less proarrhythmic than radiofrequency energy such that the initial temporary blanking period of 3 months post procedure does not apply to cryoablation and ER during this period may be a strong predictor of LR.

**METHODS** We retrospectively analyzed outcomes of 115 patients that underwent cryoablation at our institution since 2014 (paroxysmal n=68; persistent n = 47). All patients had circumferential ablation of all four pulmonary veins with isolation demonstrated by entrance and exit block. Patient were followed post procedure with a 12 lead ECG at 1-,3-,6-,12- month intervals, regular phone call assessment for symptom recurrence, and a 24 hour Holter monitor, 3 week event monitor, or internal loop recorder obtained on an individual need basis. ER was defined as any atrial tachyarrhythmia observed lasting > 30 seconds during the initial 3 months post procedure.

**RESULTS** After a median follow up period of 16 months: 31/115 patients were found to have ER; of those patients, 19 (63%) developed LR; and 12 patients (38%) developed LR without ER. Individual characteristics (history of CHF, EF < 50%, dilated left atrium, CHADs-VASc score > 2, persistent AF) did not meet statistical significance for predicting LR by Chi-square and regression analysis. The only predictor of LR was the presence of ER as determined by both regression analysis and univariate analysis (p=.030; p = 0.00). Of the 19 patients that had both ER and LR, 5 had repeat procedures, and 4 out of the 5 cases (80%) had reconnection of one or more of the pulmonary veins.

**CONCLUSION** In our study, ER after cryoablation for atrial fibrillation was shown to be an independent strong predictor of LR. These data suggest that the presence of ER after cryoablation is not a temporary phenomenon due to the proarrhythmic state post procedure but may in fact be due to a more permanent factor and possibly, reconnection of a pulmonary vein.

### 073\_16741-Q1

**Successful Management of Atrio-Esophageal Fistula (AEF) That Could Not be Detected by Conventional Imaging Methods After Catheter Ablation for Atrial Fibrillation**

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**INTRODUCTION** Atrio-esophageal fistula (AEF) development after catheter ablation for atrial fibrillation is a major complication which is hard to recognize and presents with fever and neurological symptoms. When clinical symptoms raise concerns about AEF, demonstration of the fistula by imaging methods followed with surgical therapy is recommended. However, it is challenging to choose treatment strategy when conventional imaging methods fail to detect AEF. Here we present a case of AEF after catheter ablation for atrial fibrillation that was successfully treated surgically and the treatment strategy was