Paroxysmal vs. persistent atrial fibrillation catheter ablation: Left atrial strain and recurrence

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Introduction

Strain imaging by echocardiography (TTE) is a promising tool in the evaluation of left atrial (LA) mechanical function. The aim of this study was to compare **LA structure and longitudinal strain** between **paroxysmal** (PAF) and **persistent AF** (PersAF) and **evaluate rates of AF recurrence post-catheter ablation**.

12-month follow-up

Methods

Analysis of patients (P) with **symptomatic PAF and PersAF** who underwent a **first AF catheter ablation** and had performed TTE in our centre prior to the procedure. **LA longitudinal strain** was assessed by 2D speckle-tracking at baseline: reservoir (LASr) and conduit (LAScd) phase's strain and strain rate, as well as **LA volume index** (LAVi) and **integrated backscatter** (IBS) were analysed.

AF recurrence was documented with 12-lead ECG, 24h Holter monitoring, external loop recorder (ELR) or pacemaker analysis in a 12-month follow-up.

Results

78 patients

31% Persistent AF

69% Paroxysmal AF

66% male

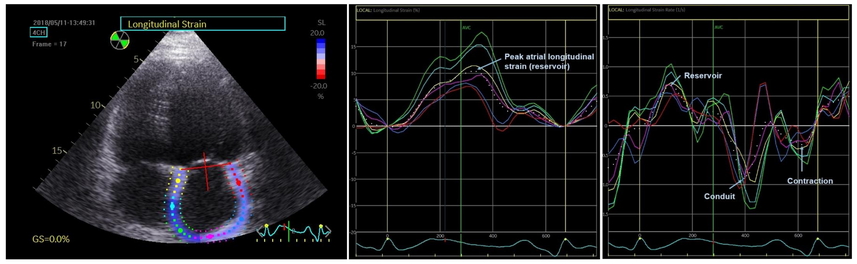
47% RF ablation

53% cryoballoon ablation

There was no significant difference between groups (PersAF and PAF) regarding mean **age** (60±10 vs 59±12 years, p=0.664), **structural heart disease** (50% vs 33%, p=0.132) or **PVI modality** (CBA 46% vs 55%, p=0.469).

P with **PersAF** had a **higher LAVi**, **reduced LA ejection fraction** and significant **impairment of reservoir phase strain and strain rate**. There was no significant difference between groups regarding conduit phase strain and strain rate as well as integrated backscatter (Figure 1).

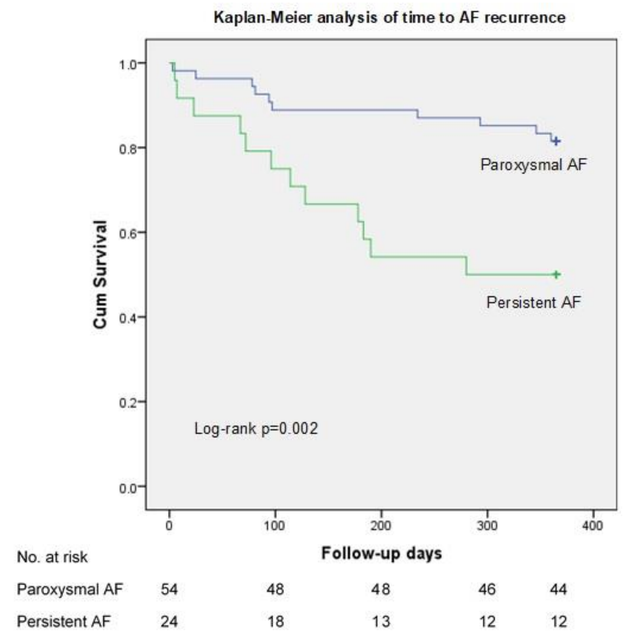
The **AF burden** at 3-month post-PVI external loop recorder was **significantly superior in PersAF**.



Measurement of left atrial phasic longitudinal strain and strain rate

TTE parameters	Persistent AF	Paroxysmal AF	p-value
LAVi	46±15 mL/m2	36±13 mL/m2	**0.004**
LA ej. fraction	19±15%	49±19%	**<0.001**
Reservoir strain	9.2±4.9%	23.9±9.3%	**<0.001**
Reservoir strain rate	0.58±0.25 s^{-1}	1.08±0.40 s^{-1}	**<0.001**
Conduit strain	-9.0±4.9%	-11.3±7.3%	0.108
Conduit strain rate	-0.92±0.61 s^{-1}	-0.94±0.39 s^{-1}	0.894
IBS	166.6±36.1 dB	106.6±21.5 dB	0.134

Figure 1



28% (22P) AF recurrence rate

PersAF 50% vs PAF 20%

Adjusted HR 3.44 (1.44-7.69), p=0.005

AF burden post-PVI ELR	Persistent AF	Paroxysmal AF	p-value
0%	50%	79%	**0.008**
1-99%	35%	21%	
99-100%	15%	0%	

In P with AF recurrence, **PersAF showed an inferior baseline LASr** (6.44±3.25 vs 13.85±5.65, p=0.003). **Reduced LASr was an independent predictor of AF recurrence** both in PAF (adjusted HR 1.29 [1.13-1.48], p<0.001) and PersAF (adjusted HR 1.22 [1.02-1.47], p=0.028).

Conclusion

P with **PersAF** showed increased **LA volume**, reduced **LA ejection fraction** and **reservoir phase strain** at baseline, as well as **superior AF burden** and 12-month **recurrence rate** after PVI vs PAF.

Reduced LASr was an independent **predictor of AF recurrence** both in PAF and PersAF.