

Left atrial strain: A strong predictor of atrial fibrillation recurrence after catheter ablation



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Background

Transthoracic echocardiography (TTE) is an accessible exam for estimating left atrial (LA) **mechanical function**, which can possibly identify patients (P) at risk for arrhythmia recurrence after catheter ablation of atrial fibrillation (AF).

The aim of this study was to evaluate **LA structure and strain** at baseline and its association with **AF recurrence after catheter ablation**.

Methods

Analysis of P with symptomatic paroxysmal and persistent AF who underwent a **single-procedure AF ablation** between 2015 and 2019 and had performed TTE in our centre prior to AF ablation. LA parameters were assessed by 2D speckle-tracking at baseline. LA volume index (LAVi), **LA ejection fraction**, **LA phasic strain: reservoir (LASr)**, conduit (LAScd) and contraction phases (LASct), as well as **integrated backscatter (IBS)** values were analysed. AF recurrence was documented with 12-lead ECG, 24h Holter monitoring, external loop recorder or pacemaker analysis during a 12-month follow-up.



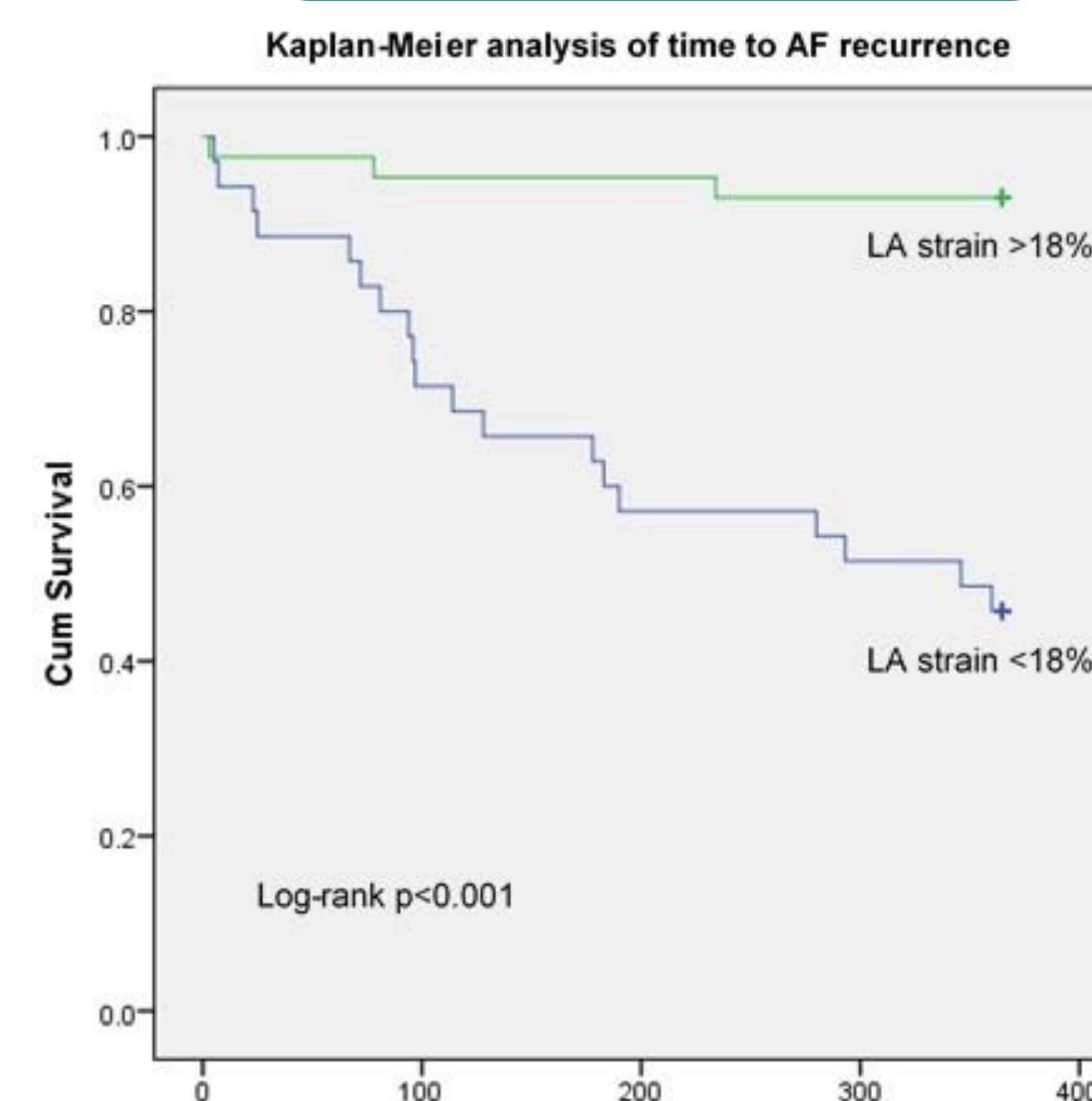
Measurement of left atrial phasic strain

Results

28% AF recurrence rate in 12-month follow-up

78 P undergoing PVI
 Mean age 59±14 years
 65% male
 40% structural heart disease
 69% Paroxysmal AF
 53% cryoballoon vs 47% RF

P with AF recurrence had a **superior LAVi** and **lower LA ejection fraction**. Multivariate analysis showed that baseline LA strain parameters were **independent predictors** of AF recurrence, as P with AF recurrence showed **impaired reservoir and conduit strain**. In P in sinus rhythm during baseline TTE, **contraction strain** also **correlated with AF recurrence**, as P with recurrence showed impaired LASct.



No. at risk	0	100	200	300	400
LA strain >18%	43	41	41	40	40
LA strain <18%	35	25	20	18	16

TTE parameters	Recurrence P	Non-recurrence P	Adjusted HR	95% CI	p-value
LAVi	47±17 mL/m2	36±12 mL/m2	1.04	1.01-1.06	0.002
LA ej. fraction	25±20%	45±21%	0.96	0.94-0.98	0.001
Reservoir strain	9.81±5.79%	22.9±9.98%	0.81	0.73-0.89	<0.001
Conduit strain	-6.74±4.11%	-11.85±7%	1.11	1.03-1.19	0.004
Contraction strain	-7.49±3.65%	-13.74±5.4%	1.39	1.11-1.75	0.005
IBS	111.2±23.9 dB	105.9±33.5 dB	1.01	0.99-1.02	0.349

LASr <18% showed a **sensitivity of 86%** and **specificity of 70%** to predict AF recurrence. Kaplan-Meier curves showed that P with **LASr below the 18% cut-off** had a significantly **higher rate of AF recurrence**.

Baseline IBS did not reveal significant differences in AF recurrence.

Conclusion

Baseline LA strain parameters were demonstrated to be **independent predictors of AF recurrence** after PVI.

A **LASr <18%** showed good accuracy to **predict AF recurrence**.