

Echocardiographic Predictors of Atrial Fibrillation Recurrence After Ablation: Insights from University Hospital Centre Zagreb

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Introduction: Echocardiographic measurements, such as left atrial (LA) volume, strain, and diastolic dysfunction, have been identified as valuable predictors of atrial fibrillation (AF) recurrence after ablation^{1,2}. These factors are associated with structural remodelling, including atrial myocardial fibrosis, which may contribute to an increased likelihood of recurrence³. In this study, we aimed to evaluate echocardiographic predictors of AF recurrence in our patient population.

Patients and Methods: We conducted a retrospective analysis of patients who underwent AF ablation between February 2022 and September 2024. AF recurrence during follow-up up was recorded. Data comparison between patients with and without recurrence was performed using t-tests and chi-square.

TABLE 1. Statistical analysis of echocardiographic measurements.

	No recurrence	AF recurrence	p value
Age	63.83±8.43	68.27±9.57	0.138
Female	10 (41.7%)	7 (46.7%)	0.759
NTproBNP	125.75±80.83	1222.17±2493.77	0.142
Diastolic dysfunction	Grade 0 = 4 (16.7%) Grade 1 = 16 (66.7%) Grade 2 = 4 (16.7%)	Grade 0 = 0 (0.0%) Grade 1 = 8 (53.3%) Grade 2 = 7 (46.7%)	0.057
LAVI	34.38±7.79	38.07±9.68	0.198
LA strain	26.58±5.30	19.33±8.23	0.002
RAV	33.08±9.98	37.13±9.93	0.224
RAA	14.13±2.74	14.93±2.52	0.362
sPAP	21.71±6.92	23.54±8.41	0.519
Deceleration time	268.13±83.38	236.40±79.46	0.247
E/A	1.03±0.40	1.61±0.51	0.381
IVRT	101.46±24.98	105.93±32.77	0.632
E/e'	6.75±1.82	9.60±2.32	<0.001
Total	24 (61.5%)	15 (38.5%)	

LAVI - left atrium indexed volume, LA – left atrium, RAV - right atrium volume, RAA - right atrium area, sPAP - systolic pulmonary artery pressure, E/A - transmitral E wave and A wave ratio, IVRT - isovolumic relaxation time, E/e' - peak early diastolic velocity of mitral inflow and mitral annular motion ratio

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Results: A total of 39 patients with preprocedural echocardiography examination available for further analysis were identified and included in the analysis. Baseline characteristics, laboratory findings, and echocardiographic measurements are summarized in **Table 1**. Statistical analysis revealed a significant difference between the recurrence and non-recurrence groups in LA reservoir strain ($p=0.002$) and E/e' ratio ($p<0.001$).

Conclusion: Although our study is limited by a small sample size, the findings align with previous research, suggesting that LA strain and E/e' ratio may serve as valuable predictors of atrial fibrillation recurrence. Future studies with larger cohorts are needed to confirm these results and integrate these echocardiographic parameters into clinical management strategies.

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