

Epicardial adipose tissue and atrial fibrillation: guilty as charged or guilty by association?

J. Sousa¹, D. Matos², A. Ferreira², J. Abecasis², C. Saraiva³, P. Freitas², J. Carmo², S. Carvalho², G. Rodrigues², A. Durazzo², F.M. Costa², P. Carmo², F. Morgado², D. Cavaco², P. Adragao²

¹Hospital Dr. Nélio Mendonça, Cardiology, Funchal, Portugal; ²Hospital de Santa Cruz, Cardiology, Lisbon, Portugal; ³Hospital de Santa Cruz, Radiology, Lisbon, Portugal

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Background: Epicardial adipose tissue (EAT) has been linked to the presence and burden of atrial fibrillation (AF). However, it is still unclear whether this relationship is causal or simply a surrogate marker of other risk factors commonly associated with AF.

Purpose: The purpose of this study was to assess the relationship between these factors and EAT, and to compare their performance in predicting AF recurrence after an ablation procedure.

Methods: We assessed 575 consecutive patients (mean age 61±11 years, 62% male) undergoing AF ablation preceded by cardiac CT in a high-volume ablation center. EAT was measured on cardiac CT using a modified simplified method. Patients were divided into 2 groups (above vs. below the median EAT volume). Cox regression was used to assess the relationship between epicardial fat, risk factors, and AF relapse.

Results: Patients with above-median EAT volume were older ($p<0.001$), more often male (OR 1.7, $p=0.002$), had higher body mass index, and higher prevalence of smoking, hypertension, diabetes and dyslipidemia

($p<0.05$). Non-paroxysmal AF was also more common in those with above-median EAT volume. During a median follow-up of 18 months, 232 patients (40.3%) suffered AF recurrence. After adjustment for BMI and other univariate predictors of relapse, three variables emerged independently associated with time to AF recurrence: non-paroxysmal AF (HR 2.1, 95% CI: 1.5–2.7, $p<0.001$), indexed left atrial (LA) volume (HR 1.006 per mL/m², 95% CI: 1.002–1.011, $p<0.001$), and indexed epicardial fat volume (HR 1.87 per mL/m², 95% CI: 1.66–2.1, $p<0.001$). None of the classic cardiovascular risk factors were an independent predictor of AF recurrence (all $p>0.10$).

Conclusion: Classic cardiovascular risk factors are more prevalent in patients with higher amounts of epicardial fat. However, unlike these risk factors, EAT is a powerful predictor of AF recurrence after ablation. These findings suggest that EAT is not merely a surrogate marker, but an important participant in the pathophysiology of AF.

Baseline characteristics of our population

	< Median EATVol	> Median EATVol	OR (CI95%)	p-value
Age (years)	58.6±12.3	64.1±9.4	-	<0.001
Gender (♂)	55.4%	67.7%	1.7 (1.2-2.4)	0.002
BMI (Kg/m ²)	26.8±4.0	29.3±4.0	-	<0.001
Smoking	19.2%	30.2%	1.8 (1.2-2.7)	0.002
Hypertension	51.9%	70.5%	2.2 (1.6-3.1)	<0.001
Diabetes	7.3%	13.5%	2.0 (1.1-3.5)	0.015
Dyslipidaemia	41.8%	56.9%	1.8 (1.3-2.6)	<0.001
Obesity (BMI>30)	21.6%	41.8%	2.6 (1.8-3.8)	<0.001
Non-paroxysmal AF	17.1%	26.7%	1.8 (1.2-2.7)	0.005

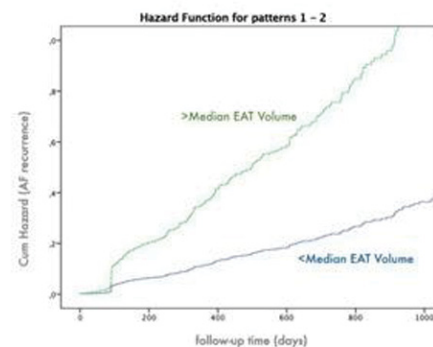


Multivariate analysis for AF recurrence (Cox)

	HR (CI 95%)	P-value
non-paroxysmal AF	2.1 (1.5-2.7)	<0.001
indexed LA volume	1.006 (1.002-1.011)	<0.001
epicardial fat volume/BSA	1.87 (1.66-2.1)	<0.001

*none of the classic cardiovascular risk factors were an independent predictor of AF recurrence over time (all $p>0.10$)

COX regression for AF recurrence over time



EAT, cvrf and AF burden