Table S1. Baseline characteristics after propensity score matching

Characteristic	No drainage (n=158)	Drainage (n=158)	P value	SMD
Age, years	65.61 ± 7.69	65.35 ± 8.07	0.770	0.033
Male sex, n (%)	113 (71.5)	111 (70.3)	0.901	0.028
BMI, kg/m²	25.14 ± 3.31	25.11 ± 3.20	0.943	0.008
Smoking, n (%)	75 (47.5)	73 (46.2)	0.910	0.025
Alcohol consumption, n (%)	58 (36.7)	59 (37.3)	1.000	0.013
Diabetes, n (%)	53 (33.5)	56 (35.4)	0.813	0.040
Hypertension, n (%)	98 (62.0)	102 (64.6)	0.726	0.053
Pulmonary hypertension, n (%)	6 (3.8)	11 (7.0)	0.319	0.141
Myocardial infarction within 90 days, n (%)	147 (93.0)	148 (93.7)	1.000	0.025
NYHA class	2.73 ± 0.56	2.78 ± 0.58	0.429	0.089
CCS class	2.79 ± 0.74	2.83 ± 0.76	0.653	0.051
LVEF, %	58.36 ± 7.66	57.87 ± 9.03	0.601	0.059
LAD, mm	36.00 [34.00, 39.00]	37.00 [35.00, 40.00]	0.532	0.060
LVDd, mm	49.26 ± 4.02	49.47 ± 5.58	0.694	0.044
Aortic stenosis, n (%)	0 (0.0)	0 (0.0)	1.000	0.000
Aortic regurgitation, n (%)	54 (34.2)	46 (29.1)	0.397	0.109
Mitral stenosis, n (%)	3 (1.9)	2 (1.3)	1.000	0.051
Mitral regurgitation, n (%)	130 (82.3)	132 (83.5)	0.881	0.034
eGFR, mL/min/1.73 m²	116.75 [99.77, 120.00]	115.32 [98.92, 120.00]	0.509	0.123
Creatinine, μmol/L	61.50 [54.00, 72.00]	63.00 [52.00, 75.00]	0.627	0.136
Albumin, g/L	42.05 [39.23, 44.53]	41.75 [39.32, 44.15]	0.565	0.034
Magnesium, mmol/L	0.85 [0.81, 0.91]	0.86 [0.82, 0.91]	0.594	0.012
Hemoglobin, g/L	136.25 ± 15.38	135.72 ± 16.30	0.763	0.034
BNP, pg/mL	216.10 [115.00, 590.75]	258.00 [109.34, 667.00]	0.448	0.091

Characteristic	No drainage (n=158)	Drainage (n=158)	P value	SMD
Troponin T, ng/mL	14.30 [7.58, 36.08]	14.30 [7.85, 55.43]	0.412	0.024
WBC count, ×10⁹/L	6.94 ± 3.10	6.97 ± 2.27	0.937	0.009
Platelet count, ×10⁹/L	209.78 ± 58.34	214.05 ± 65.51	0.541	0.069
Beta-blockers, n (%)	130 (82.3)	128 (81.0)	0.884	0.033
Statins, n (%)	150 (94.9)	150 (94.9)	1.000	0.000
ACEI, n (%)	3 (1.9)	3 (1.9)	1.000	0.000
ARB, n (%)	33 (20.9)	40 (25.3)	0.423	0.105
Diuretics, n (%)	37 (23.4)	32 (20.3)	0.586	0.077
Insulin, n (%)	13 (8.2)	14 (8.9)	1.000	0.023
Oral hypoglycemic agents, n (%)	30 (19.0)	32 (20.3)	0.887	0.032
Dapagliflozin, n (%)	36 (22.8)	36 (22.8)	1.000	0.000
Concomitant surgery, n	0.04 ± 0.21	0.03 ± 0.18	0.558	0.066
Number of diseased vessels	3.23 ± 0.81	3.23 ± 0.79	0.944	0.008
Cardiopulmonary bypass, n (%)	90 (57.0)	85 (53.8)	0.651	0.064
Surgery duration, min	338.99 ± 56.31	341.63 ± 51.63	0.664	0.049
Anesthesia duration, min	393.58 ± 62.67	397.53 ± 56.83	0.557	0.066

Continuous variables are presented as mean ± SD or median [IQR]; categorical variables as n (%). SMD, standardized mean difference; BMI, body mass index; LVEF, left ventricular ejection fraction; LAD, left atrial diameter; LVDd, left ventricular end-diastolic diameter; eGFR, estimated glomerular filtration rate; BNP, B-type natriuretic peptide; WBC, white blood cell; ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker. The high prevalence of recent myocardial infarction reflects the referral pattern at our institution, where many patients present with acute coronary syndrome and undergo CABG within 90 days of the index event.

Table S2. Variance inflation factors (VIF) for multivariable models

Model	**Variable**	**VIF**
Model 1 (low magnesium)	Drainage	1.02

Model	Variable	VIF
Model 1 (low magnesium)	LowMg	1.10
Model 1 (low magnesium)	Concomitant	1.13
Model 1 (low magnesium)	PulmHTN	1.17
Model 1 (low magnesium)	Diabetes	1.07
Model 1 (low magnesium)	Hypertension	1.12
Model 1 (low magnesium)	Male	1.05
Model 1 (low magnesium)	Age	1.09
Model 1 (low magnesium)	LVEF	1.17
Model 1 (low magnesium)	BMI	1.11
Model 1 (low magnesium)	eGFR	1.03
Model 1 (low magnesium)	Albumin	1.12
Model 2 (continuous magnesium)	Drainage	1.02
Model 2 (continuous magnesium)	Mg_cont	1.16
Model 2 (continuous magnesium)	Concomitant	1.13
Model 2 (continuous magnesium)	PulmHTN	1.15
Model 2 (continuous magnesium)	Diabetes	1.08
Model 2 (continuous magnesium)	Hypertension	1.12
Model 2 (continuous magnesium)	Male	1.05
Model 2 (continuous magnesium)	Age	1.11
Model 2 (continuous magnesium)	LVEF	1.16
Model 2 (continuous magnesium)	BMI	1.12
Model 2 (continuous magnesium)	eGFR	1.04
Model 2 (continuous magnesium)	Albumin	1.15

VIF > 5 indicates multicollinearity. All VIFs were < 1.2, indicating no multicollinearity.

Table S3. Minimum detectable effect analysis

Outcome	Power	Sample size	Baseline rate	MDE OR	Observed OR
Primary: low magnesium vs normal magnesium	80%	134 vs 386	21.8%	1.87	1.94
Primary: low magnesium vs normal magnesium	90%	134 vs 386	21.8%	2.05	1.94
Secondary: pleural drainage vs no drainage	80%	166 vs 354	24.3%	1.78	1.34
Secondary: pleural drainage vs no drainage	90%	166 vs 354	24.3%	1.94	1.34

MDE, minimum detectable effect; OR, odds ratio; POAF, postoperative atrial fibrillation. MDE was calculated post hoc for each association using its own sample sizes and baseline event rate, with a two-sided $\alpha = 0.05$. No a priori sample size calculation was performed. The MDE is reported as a descriptive measure of precision; it does not constitute evidence of adequate study power. For the secondary association (pleural drainage vs no drainage), the observed OR (1.34) was below the MDE at both 80% and 90% power, indicating that the study was underpowered to detect small-to-moderate effects for the drainage comparison.

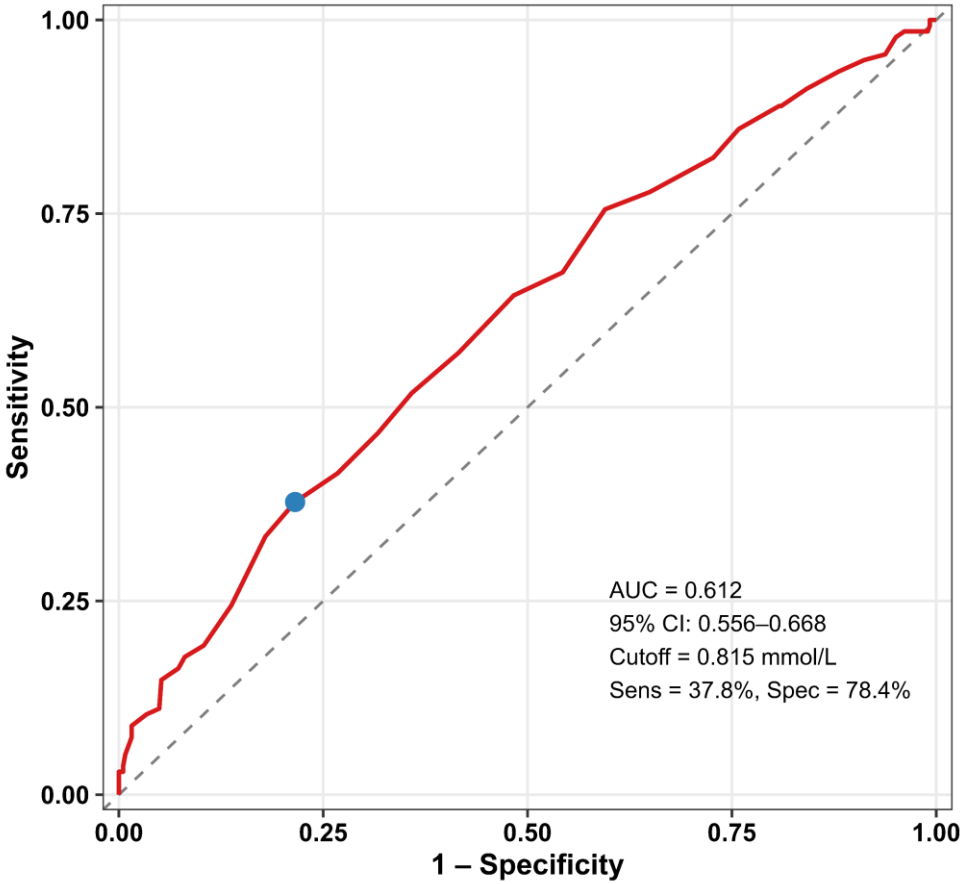


Figure S1. Exploratory receiver operating characteristic curve of serum magnesium for predicting POAF. Because the cutoff was derived from and tested in the same cohort, the AUC and cutoff are subject to optimistic bias and require external validation.

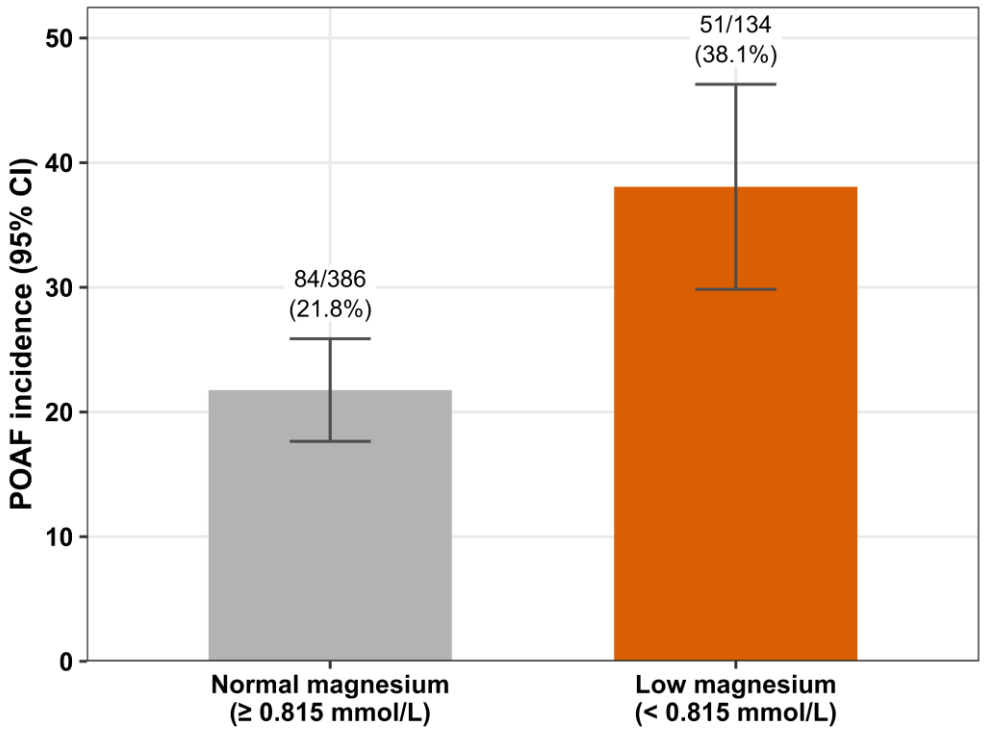


Figure S2. Incidence of POAF in patients with normal (≥ 0.815 mmol/L) and low (< 0.815 mmol/L) serum magnesium. Error bars indicate 95% confidence intervals; numbers above the bars are events/total (percentage).

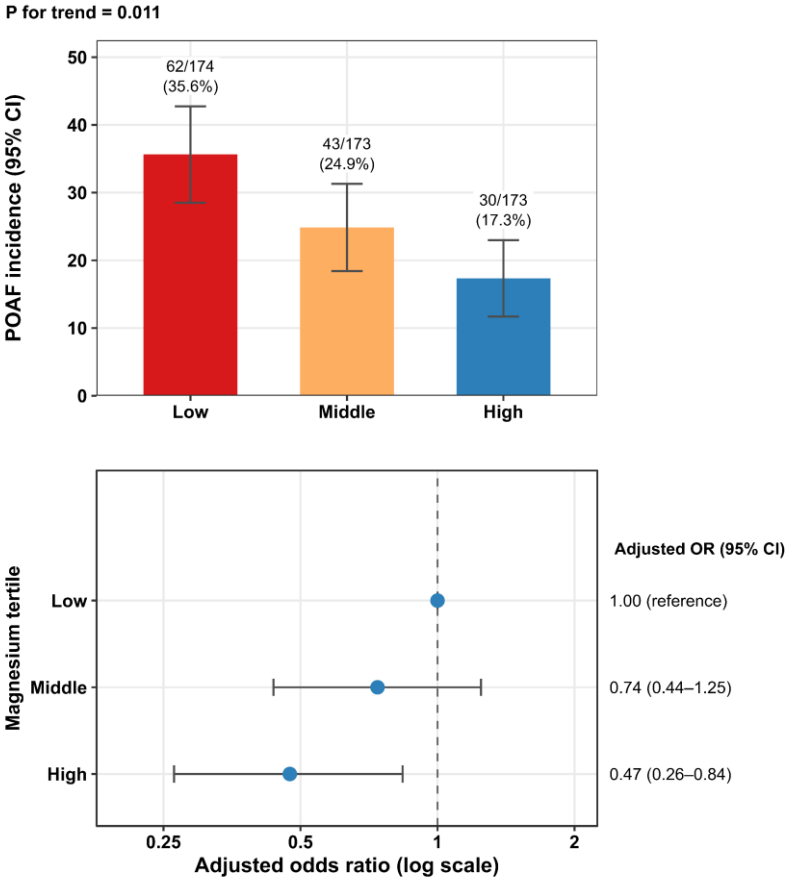


Figure S3. Dose-response analysis across serum magnesium tertiles. Top, incidence of POAF. Bottom, adjusted odds ratios (95% confidence intervals) with the lowest tertile as reference; the model was adjusted for pleural drainage, concomitant surgery, pulmonary hypertension, diabetes, age, eGFR and albumin.

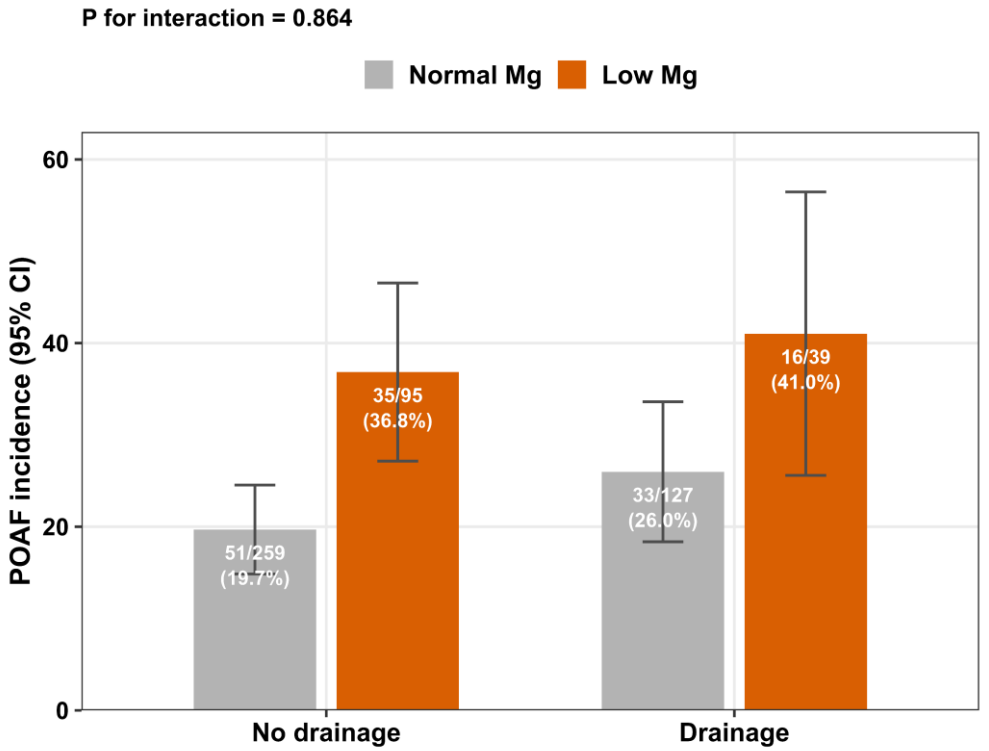


Figure S4. Interaction between pleural drainage and low magnesium status on POAF. Groups are no drainage with normal magnesium, no drainage with low magnesium, drainage with normal magnesium, and drainage with low magnesium. Error bars indicate 95% confidence intervals.

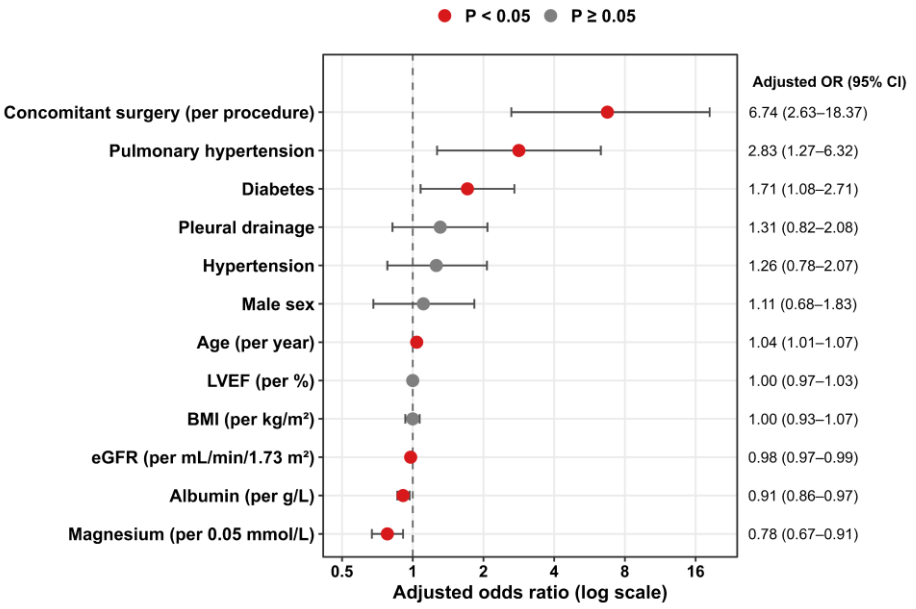


Figure S5. Multivariable logistic regression with continuous magnesium (Table 3B). Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) are shown on a logarithmic scale; the dashed line marks an OR of 1. Red circles indicate $P < 0.05$, gray circles $P \geq 0.05$.