

Supplementary Materials

Prognostic impact of changes in left ventricular systolic function and wall motion score index in patients with myocardial infarction

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Predicting factors for improvement of LVEF and WMSI

Supplementary Table 1. Univariate and Multivariate logistic regression analysis for improvement of LVEF and WMAs in patients with successful PCI due to AMI

Variables	Univariate analysis		Multivariate analysis	
	HR (95% CI)	P-value	HR (95% CI)	P-value
Patient factors				
Age (<65 years vs. ≥65)	0.83 (0.71-0.98)	0.026	0.91 (0.78-1.07)	0.262
Sex (female vs. male)	1.05 (0.88-1.24)	0.605		
Body mass index, kg/m ²	0.90 (0.76-1.06)	0.220		
Hypertension	0.87 (0.74-1.01)	0.071		
Diabetes	0.92 (0.77-1.11)	0.387		
Dyslipidemia	1.09 (0.85-1.40)	0.517		
Prior myocardial infarction	0.64 (0.46-0.90)	0.010	0.65 (0.46-0.94)	0.020
Prior heart failure	0.99 (0.42-2.35)	0.980		
Smoking status				
Never smoker	reference			
Ex-smoker	1.11 (0.90-1.36)	0.333		
Current smoker	1.00 (0.85-1.17)	0.951		
Killip classification				
Class I	reference			
Class II	1.08 (0.82-1.39)	0.614		
Class III	0.79 (0.59-1.08)	0.142		
Class IV	0.79 (0.50-1.24)	0.307		
Family history of CAD	0.95 (0.71-1.29)	0.749		
Initial SBP (<130 vs ≥130)	1.31 (1.12-1.53)	0.001	1.21 (1.04-1.42)	0.017
Initial HR (≤75 vs. >75)	1.16 (0.99-1.35)	0.072		
Anemia (<12mg/dL)	0.84 (0.69-1.02)	0.080		
LVEF, % (≤40% vs. >40%)	0.79 (0.65-0.97)	0.025	0.93 (0.74-1.24)	0.548
LVESVI, mm ² (<23.8 vs. 23.8)	1.05 (0.86-1.28)	0.627		
Diagnosis				
NSTEMI	Reference			
STEMI	0.86 (0.73-1.00)	0.057		
Initial LDL-C				
Quartile 1	Reference			
Quartile 2	0.96 (0.76-1.20)	0.621		
Quartile 3	1.06 (0.85-1.33)	0.730		
Quartile 4	1.24 (0.99-1.55)	0.133		
Initial HDL-C				
Quartile 1	Reference			
Quartile 2	1.18 (0.94-1.49)	0.154		
Quartile 3	1.07 (0.86-1.34)	0.549		
Quartile 4	1.23 (0.98-1.55)	0.072		
ACC/AHA lesion classification				
Type A	Reference			
Type B1	2.03 (0.91-4.62)	0.091		
Type B2	1.88 (0.84-4.19)	0.123		
Type C	1.73 (0.78-3.85)	0.176		
Initial TIMI flow				
Grade 3	Reference		Reference	
Grade 2	0.92 (0.68-1.14)	0.325	0.95 (0.72-1.24)	0.700
Grade 1	1.03 (0.78-1.35)	0.862	1.01 (0.76-1.36)	0.937
Grade 0	0.73 (0.61-0.89)	0.002	0.69 (0.57-0.85)	<0.001
Procedure or Post PCI factors				

Prasugrel or ticagrelor during 1Y	0.80 (0.63-1.03)	0.085		
ACE inhibitor during 1Y	1.33 (1.13-1.57)	0.001	1.32 (1.07-1.62)	0.008
Basal statin	1.30 (0.96-1.78)	0.955		
Imaging-guided PCI	1.17 (0.99-1.40)	0.070		
Imaging-guided PCI and BB therapy for 1Y				
Angiography-guided PCI and non-BB treatment	Reference		Reference	
Imaging-guided PCI without BB therapy or Angiography-guided PCI and BB therapy	1.24 (1.03-1.49)	0.026	1.27 (1.02-1.57)	0.031
Imaging-guided PCI and BB therapy	1.53 (1.20-1.93)	<0.001	1.46 (1.12-1.90)	0.005
Stent diameter				
Quartile 1	Reference			
Quartile 2	0.93 (0.77-1.14)	0.586		
Quartile 3	1.12 (0.91-1.37)	0.511		
Quartile 4	0.97 (0.73-1.29)	0.828		
Stent length				
Quartile 1	Reference			
Quartile 2	1.27 (1.02-1.58)	0.035	1.16 (0.93-1.43)	0.190
Quartile 3	1.08 (0.86-1.35)	0.501	1.01 (0.81-1.26)	0.953
Quartile 4	1.14 (0.91-1.43)	0.270	1.02 (0.81-1.27)	0.892
Post PCI TIMI flow				
Grade 3	Reference			
Grade 2	0.68 (0.44-1.06)	0.097		
Grade 1	0.83 (0.22-3.23)	0.792		
PCI to LM	1.08 (0.69-1.69)	0.738		
PCI to LAD	1.31 (1.02-1.68)	0.032	0.87 (0.73-1.05)	0.147
PCI to LCX	0.96 (0.82-1.12)	0.576		
PCI to RCA	0.90 (0.77-1.04)	0.213		
Revascularization strategy				
Culprit-lesion-only PCI	Reference			
Multivessel PCI	0.99 (0.82-1.20)	0.966		
PCI procedures				
Index procedure PCI	Reference			
Staged PCI	0.82 (0.64-1.05)	0.109		

Abbreviations: HR, hazard ratio; CI, confidence interval; CAD, coronary artery disease; LVEF, left ventricular ejection fraction; NSTEMI, non-ST elevation myocardial infarction; STEMI, ST elevation myocardial infarction; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; ACC/AHA, American college of cardiology/American heart association; TIMI, thrombolysis in myocardial infarction; PCI, percutaneous coronary intervention; RAAS, renin-angiotensin-aldosterone system; FFR, fraction flow reserve; BB, beta-blocker; LM, left main; LAD, left anterior descending; LCX, left circumflex; RCA, right coronary artery

Supplementary Table 2. Odd ratio (OR) for LV remodeling according to imaging-guided PCI and beta-blocker therapy

LV remodeling	¶Adjusted OR (95% CI)	P-value
^aLV reverse remodeling in patients with baseline LVEF> 40%		
Angiography-guided PCI without BB therapy	1	
Imaging-guided PCI without BB therapy	1.05 (0.78-1.41)	0.765
Angiography-guided PCI with BB therapy	0.88 (0.59-1.30)	0.522
Imaging-guided PCI with BB therapy	1.10 (0.79-1.54)	0.573
^bLV adverse remodeling in patients with baseline LVEF> 40%		
Angiography-guided PCI without BB therapy	1	
Imaging-guided PCI without BB therapy	1.05 (0.75-1.46)	0.781
Angiography-guided PCI with BB therapy	1.02 (0.67-1.57)	0.917
Imaging-guided PCI with BB therapy	1.10 (0.76-1.60)	0.608
LV reverse remodeling in patients with baseline LVEF≤ 40%		
Angiography-guided PCI without BB therapy	1	
Imaging-guided PCI without BB therapy	1.57 (0.77-3.17)	0.213
Angiography-guided PCI with BB therapy	1.85 (0.48-7.19)	0.375
Imaging-guided PCI with BB therapy	4.29 (1.67-10.97)	0.002
LV adverse remodeling in patients with baseline LVEF≤ 40%		
Angiography-guided PCI without BB therapy	1	
Imaging-guided PCI without BB therapy	0.61 (0.29-1.27)	0.187
Angiography-guided PCI with BB therapy	0.72 (0.21-2.44)	0.603
Imaging-guided PCI with BB therapy	0.64 (0.36-1.14)	0.066

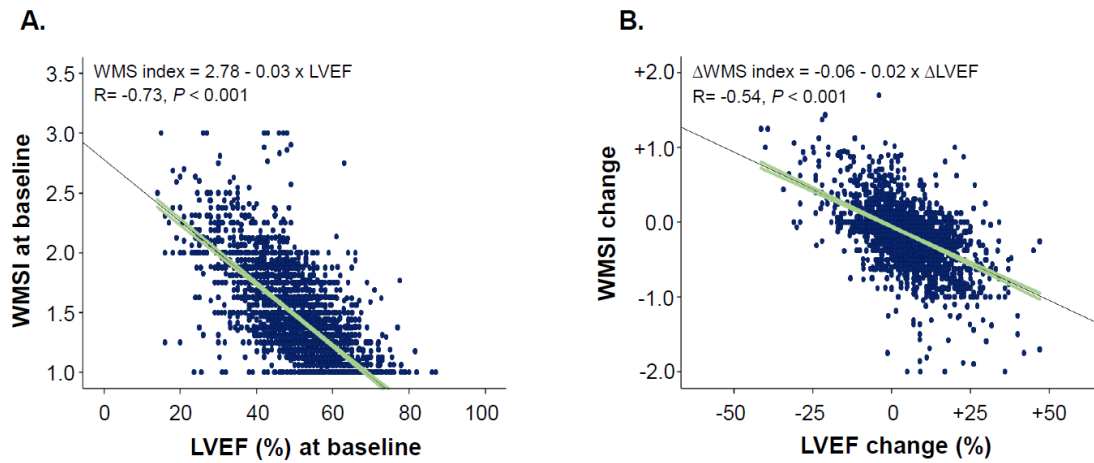
Abbreviations: LV, left ventricular; PCI, percutaneous coronary intervention; BB, beta-blocker; LVEF, left ventricular ejection fraction

¶Adjusted variables: age, sex, BMI, hypertension, diabetes mellitus, previous MI, baseline blood pressure, angiotensin-converting enzyme (ACE) inhibitor treatment.

a: LV post-infarct adverse remodeling was defined as LV dilatation with LVEDV increase of $\geq 20\%$ from baseline to 1-year follow-up after PCI

b: LV reverse remodeling was defined as $\geq 15\%$ reduction in LVESV from baseline to 1-year follow-up after PCI

Supplementary Figure 1. Correlation between LVEF and WMSI among patients with successful PCI due to AMI

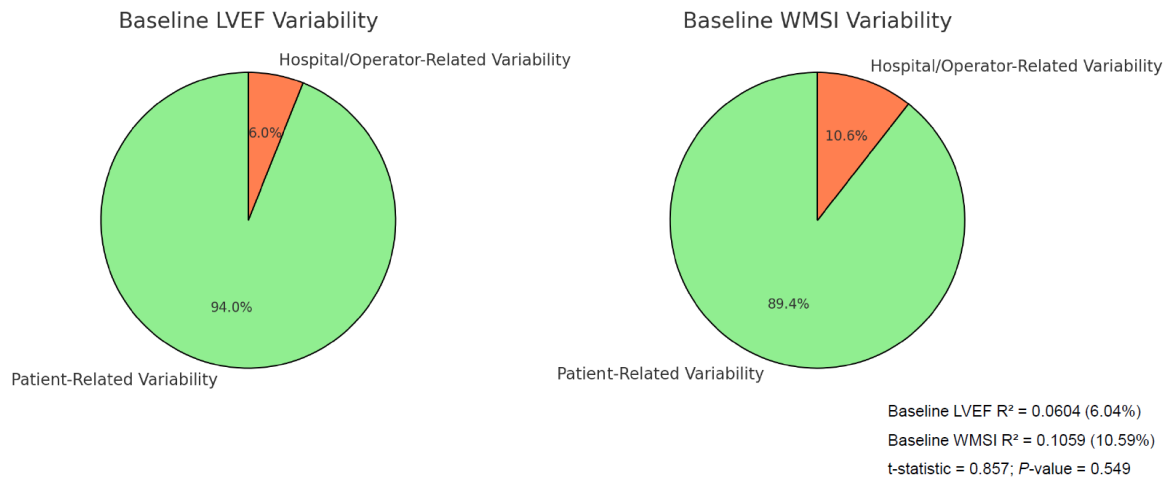


A scatter plot showed a negative correlation between baseline LVEF and WMSI (A). Changes in LVEF and WMSI were also negatively correlated between the baseline and 1-year follow-up after PCI (B).

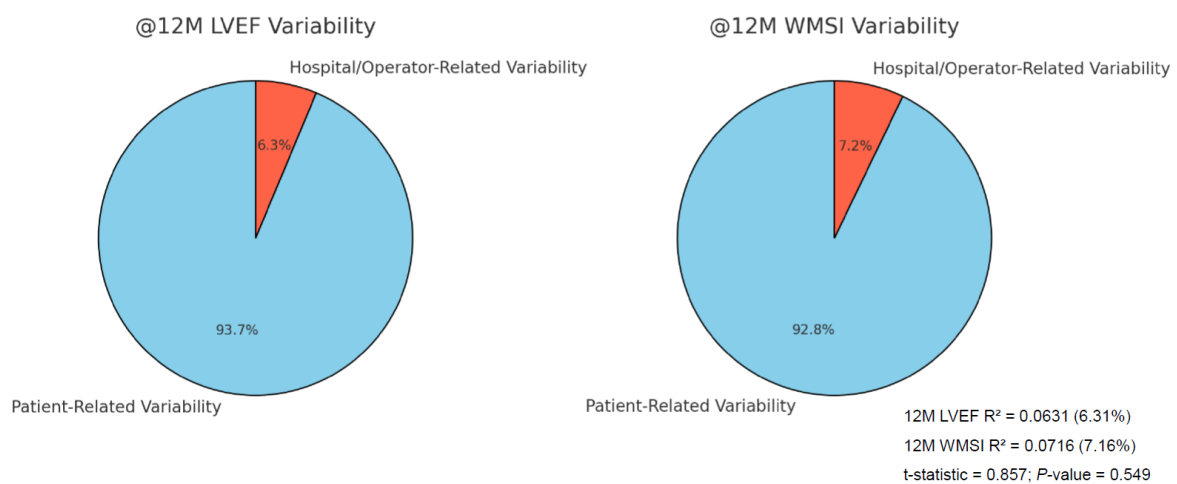
LVEF, left ventricular ejection fraction; WMSI, wall motion score index; PCI, percutaneous coronary intervention; AMI, acute myocardial infarction; Change in LVEF and WMSI was calculated by subtracting the values measured at initial hospitalization from those measured one year post-PCI.

Supplementary Figure 2. Inter-operator variability estimated using hospital-based differences

A.



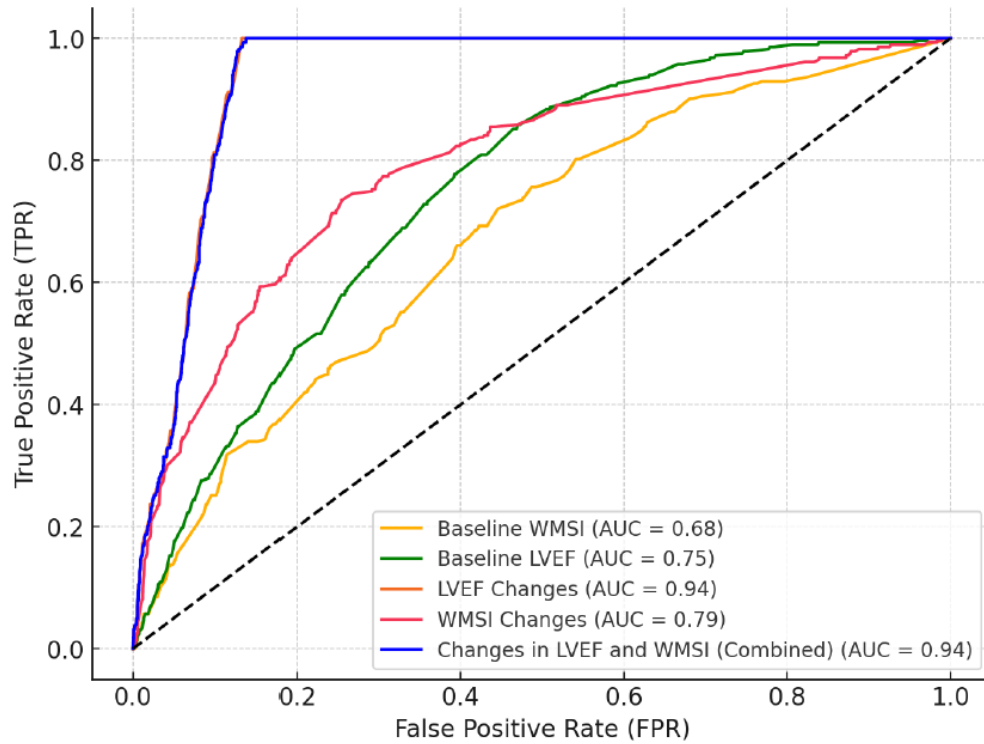
B.



The variance decomposition plot for LVEF and WMSI illustrates inter-operator variability. (A) represents the estimated variability at baseline, while (B) shows the estimation at the 12-month follow-up, both based on hospital-related differences.

LVEF, left ventricular ejection fraction; WMSI, wall motion score index

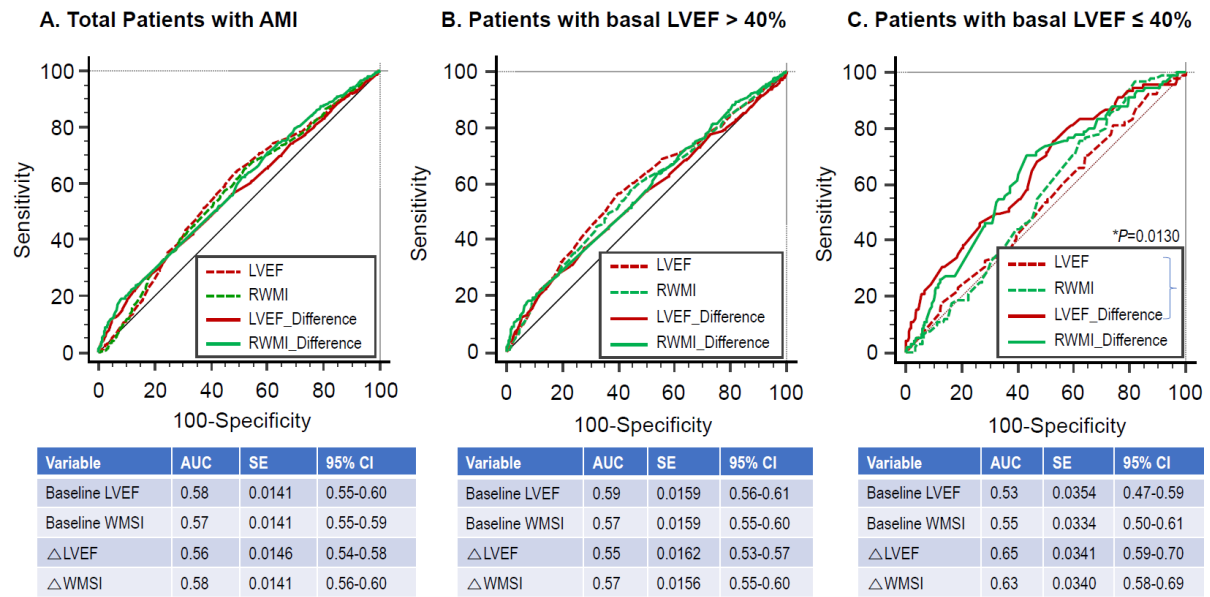
Supplementary Figure 3. Pairwise comparison of ROC curves for predicting LV reverse remodeling



The pairwise comparison of ROC curves for LV reverse remodeling is presented.

LV, left ventricular; LVEF, left ventricular ejection fraction; WMSI, wall motion score index

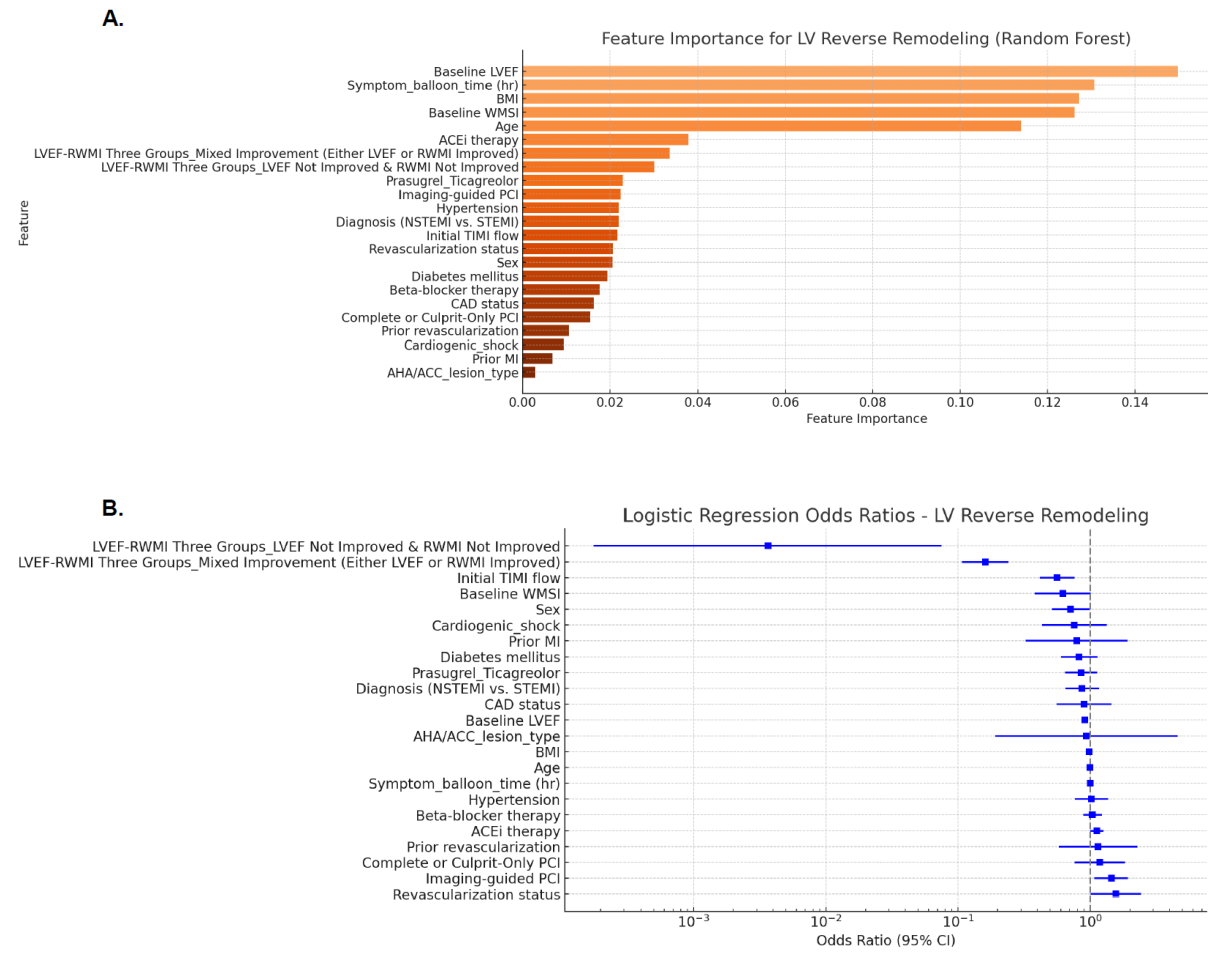
Supplementary Figure 4. Pairwise comparison of ROC curves for LV adverse remodeling



Pairwise comparison of ROC curves for LV adverse remodeling in all patients (A), in patients with baseline LVEF >40% (B), and in patients with baseline LVEF ≤40% (C).

LV, left ventricular; LVEF, left ventricular ejection fraction; WMSI, wall motion score index

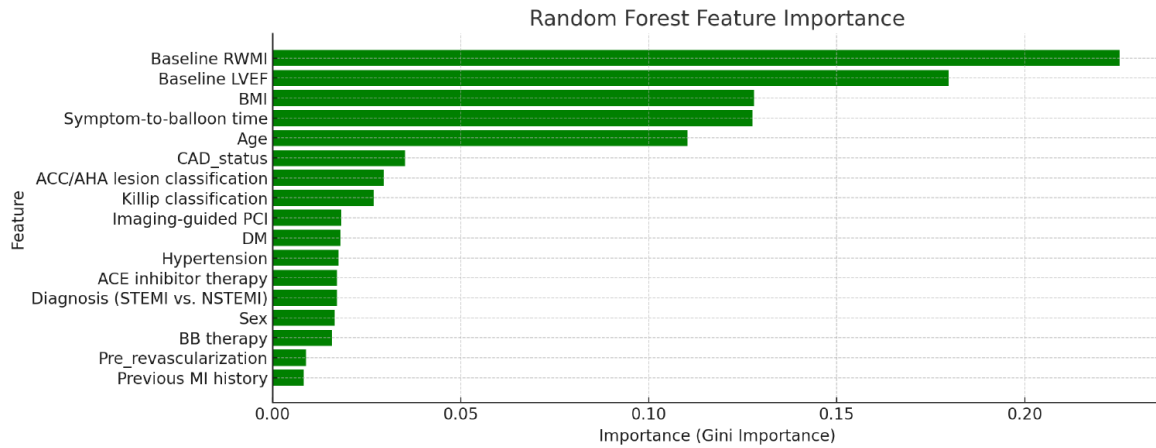
Supplementary Figure 5. Predicting factors for LV Reverse remodeling



Random forest model (A) and logistic regression model (B) were utilized to identify predictors of LV reverse remodeling, and the results are presented.

LVEF, left ventricular ejection fraction; WMSI, wall motion score index; BMI, body mass index; ACEi, Angiotensin-converting enzyme inhibitors; STEMI, ST-elevation myocardial infarction; NSTEMI, non-ST-elevation myocardial infarction; TIMI, thrombolysis in myocardial infarction; CAD, coronary artery disease; PCI, percutaneous coronary intervention; AHA/ACC, American Heart Association and American College of Cardiology.

Supplementary Figure 6. Predicting factors for improvement of LVEF and WMSI



The results of random forest model to identify predictors of LV adverse remodeling are presented.

LVEF, left ventricular ejection fraction; WMSI, wall motion score index; BMI, body mass index; ACEi, Angiotensin-converting enzyme inhibitors; STEMI, ST-elevation myocardial infarction; NSTEMI, non-ST-elevation myocardial infarction; TIMI, thrombolysis in myocardial infarction; CAD, coronary artery disease; PCI, percutaneous coronary intervention; AHA/ACC, American Heart Association and American College of Cardiology