

Supplementary Materials

Supplementary Table S1 Detailed Angiographic and Mechanistic Findings of the Study Population

Characteristic	<i>n</i>	%
Coronary vessel involvement		
LAD involvement	436	48.3
CX involvement	146	16.2
RCA involvement	231	25.6
Extent of coronary vessel involvement		
No vessel involvement	297	32.9
Single-vessel disease	416	46.1
Double-vessel disease	173	19.2
Triple-vessel disease	17	1.9
Coronary disease pattern		
Multivessel disease, ≥ 2 vessels	190	21.0
Non-multivessel disease, 0–1 vessel	713	79.0
Exploratory non-obstructive/mechanistic classifications		
ANOCA	30	3.3
INOCA	14	1.6
MINOCA	42	4.7
of which SCAD	4	0.4

LAD, left anterior descending artery; CX, circumflex artery; RCA, right coronary artery; ANOCA, angina with non-obstructive coronary arteries; INOCA, ischemia with non-obstructive coronary arteries; MINOCA, myocardial infarction with non-obstructive coronary arteries; SCAD, spontaneous coronary artery dissection. Values are presented as *n* (%), calculated using the full cohort as the denominator (*n* = 903). Vessel-involvement categories are not mutually exclusive because some patients had multivessel involvement. Multivessel disease was defined as involvement of two or more major epicardial coronary arteries. SCAD is shown as a subgroup of MINOCA. ANOCA, INOCA, MINOCA, and SCAD were reported descriptively and were not included in multivariable survival modeling.

Supplementary Table S2 Kaplan-Meier Log-Rank Test Results for Survival Analyses

Variable	Groups compared	Figure	<i>p</i> (log-rank)
Obesity	Obese vs non-obese	Fig. 1A	0.0019
LAD involvement	Present vs absent	Fig. 1B	<0.001
Smoking	Smoker vs non-smoker	Fig. S1A	0.17
Hypertension	Present vs absent	Fig. S1B	0.17
Hyperlipidemia	Present vs absent	Fig. S1C	0.72
Diabetes mellitus	Present vs absent	Fig. S1D	0.95
Family history	Present vs absent	Fig. S2A	0.13
SMuRF status	SMuRF-positive vs SMuRF-less	Fig. S2B	0.78
CX involvement	Present vs absent	Fig. S2C	0.70
RCA involvement	Present vs absent	Fig. S2D	0.65
Sex	Female vs male	Fig. S3A	0.70
ACS type	STEMI vs NSTEMI vs UA	Fig. S3B	0.19

ACS, acute coronary syndrome; STEMI, ST-segment elevation myocardial infarction; NSTEMI, non-ST-segment elevation myocardial infarction; UA, unstable angina; SMuRF, standard modifiable cardiovascular risk factor; LAD, left anterior descending artery; CX, circumflex artery; RCA, right coronary artery. Log-rank tests were used to compare survival distributions between groups. Identical *p* values for smoking and hypertension are coincidental. Statistical significance was defined as $p < 0.05$.

Supplementary Table S3 Parsimonious Cox Regression Model After Administrative Censoring at 10 Years

Predictor	Adjusted HR	95% CI	<i>p</i>
Age, per 1-year increase	0.987	0.932–1.045	0.646
Female sex	0.497	0.208–1.190	0.117
Obesity	2.494	1.341–4.638	0.004
LAD involvement	3.829	1.894–7.739	<0.001

HR, hazard ratio; CI, confidence interval; LAD, left anterior descending artery. The model included age, female sex, obesity, and LAD involvement. Follow-up was administratively censored at 10 years. Male sex, absence of obesity, and absence of LAD involvement were used as reference categories. The event indicator was all-cause mortality. Statistical significance was defined as $p < 0.05$.

Supplementary Table S4 Clinical and Angiographic Findings According to SMuRF Status

Characteristic	SMuRF-less (<i>n</i> = 96)	SMuRF-positive (<i>n</i> = 807)	<i>p</i>
Age, years	36.0 [31.5–38.0]	36.0 [32.0–39.0]	0.419
Female sex	38 (39.6)	115 (14.3)	<0.001
ACS type			0.672
STEMI	53 (55.2)	475 (58.9)	
NSTEMI	35 (36.5)	258 (32.0)	
UA	8 (8.3)	74 (9.2)	
Obesity	36 (37.5)	144 (17.8)	<0.001
LAD involvement	66 (68.8)	370 (45.8)	<0.001
CX involvement	21 (21.9)	125 (15.5)	0.108
RCA involvement	27 (28.1)	204 (25.3)	0.546
Extent of vessel involvement			<0.001
No vessel involvement	14 (14.6)	283 (35.1)	
Single-vessel disease	54 (56.3)	362 (44.9)	
Multivessel disease, ≥ 2 vessels	28 (29.2)	162 (20.1)	
All-cause mortality	6 (6.3)	45 (5.6)	0.787

SMuRF, standard modifiable cardiovascular risk factor; ACS, acute coronary syndrome; STEMI, ST-segment elevation myocardial infarction; NSTEMI, non-ST-segment elevation myocardial infarction; UA, unstable angina; LAD, left anterior descending artery; CX, circumflex artery; RCA, right coronary artery. Values are presented as *n* (%) unless otherwise specified. Percentages were calculated within each SMuRF group. Age is presented as median [interquartile range] and was compared using the Mann–Whitney U test. Categorical variables were compared using the chi-square test or Fisher’s exact test, as appropriate. For multi-category variables, including ACS type and vessel involvement extent, the *p* value represents the overall chi-square test for the full distribution across categories; therefore, separate category-specific 2×2 *p* values were not calculated or reported. Adjusted residuals were used only to inspect which cells contributed most strongly to significant overall associations. Multivessel disease was defined as involvement of two or more vessels. Statistical significance was defined as *p* < 0.05.

Supplementary Figure S1

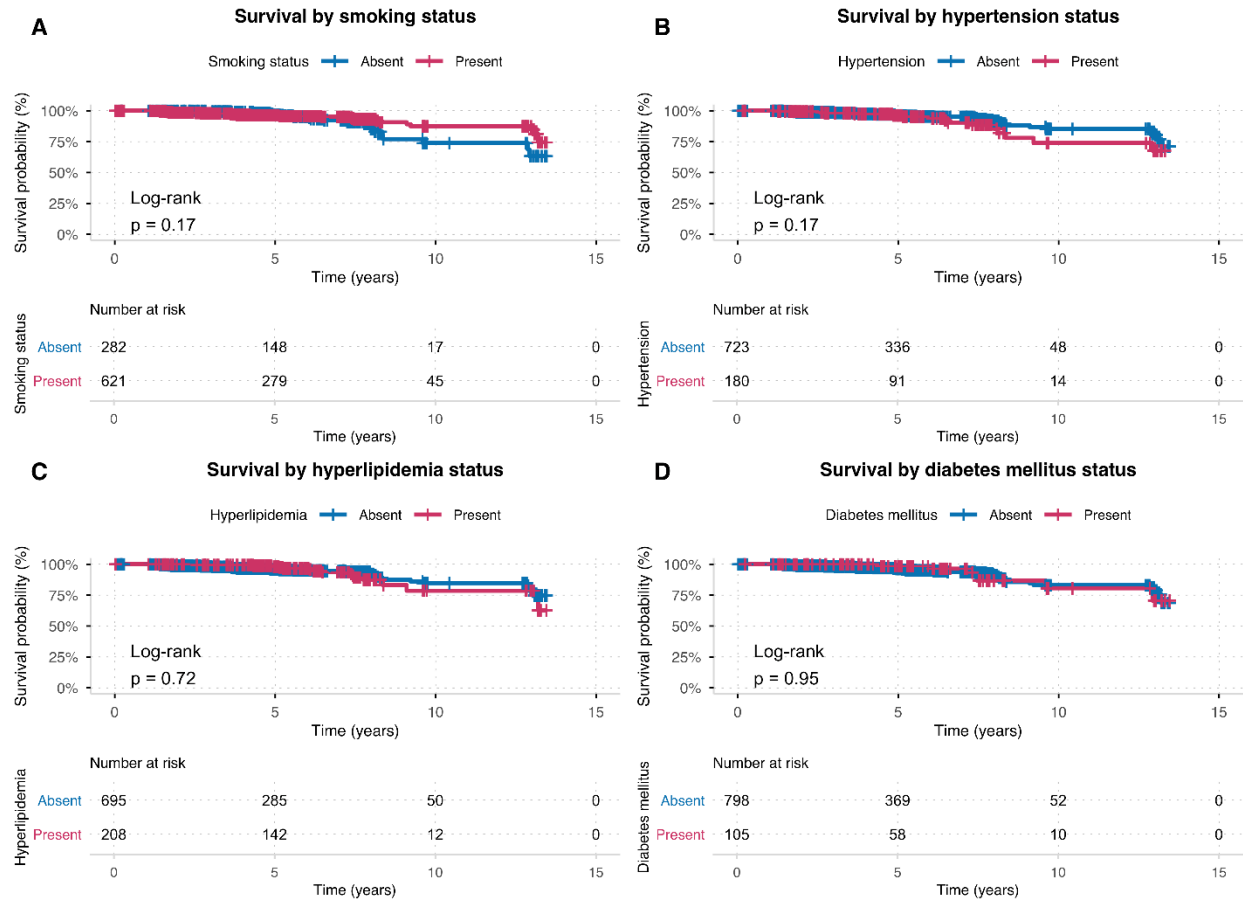


Fig. S1 Kaplan-Meier survival curves according to conventional cardiovascular risk factors. (A) Smoking status, (B) hypertension status, (C) hyperlipidemia status, and (D) diabetes mellitus status. Survival distributions were compared using the log-rank test. Statistical significance was defined as $p < 0.05$.

Supplementary Figure S2

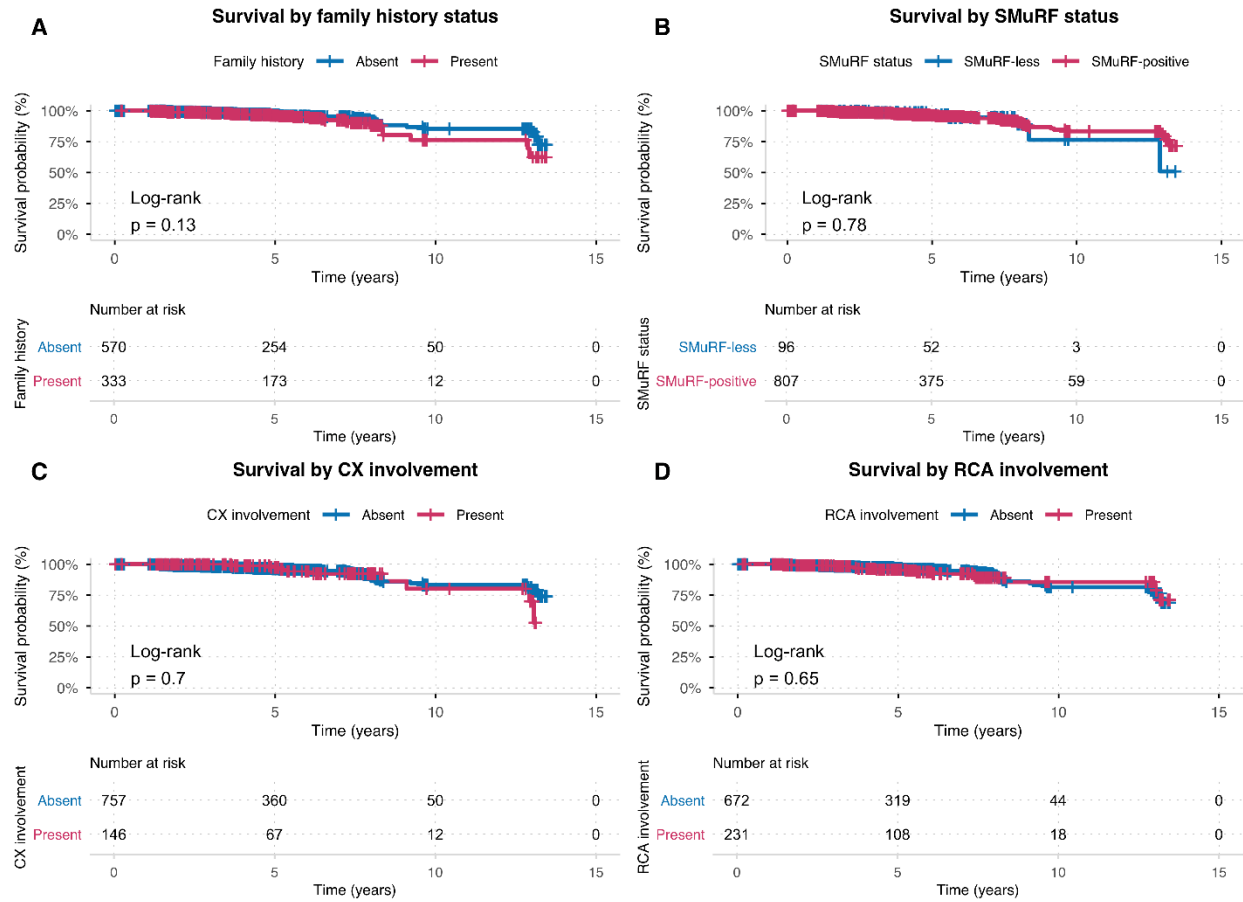


Fig. S2 Kaplan-Meier survival curves according to additional risk and angiographic variables. (A) Family history status, (B) SMuRF status, (C) CX involvement, and (D) RCA involvement. Survival distributions were compared using the log-rank test. Statistical significance was defined as $p < 0.05$.

Supplementary Figure S3

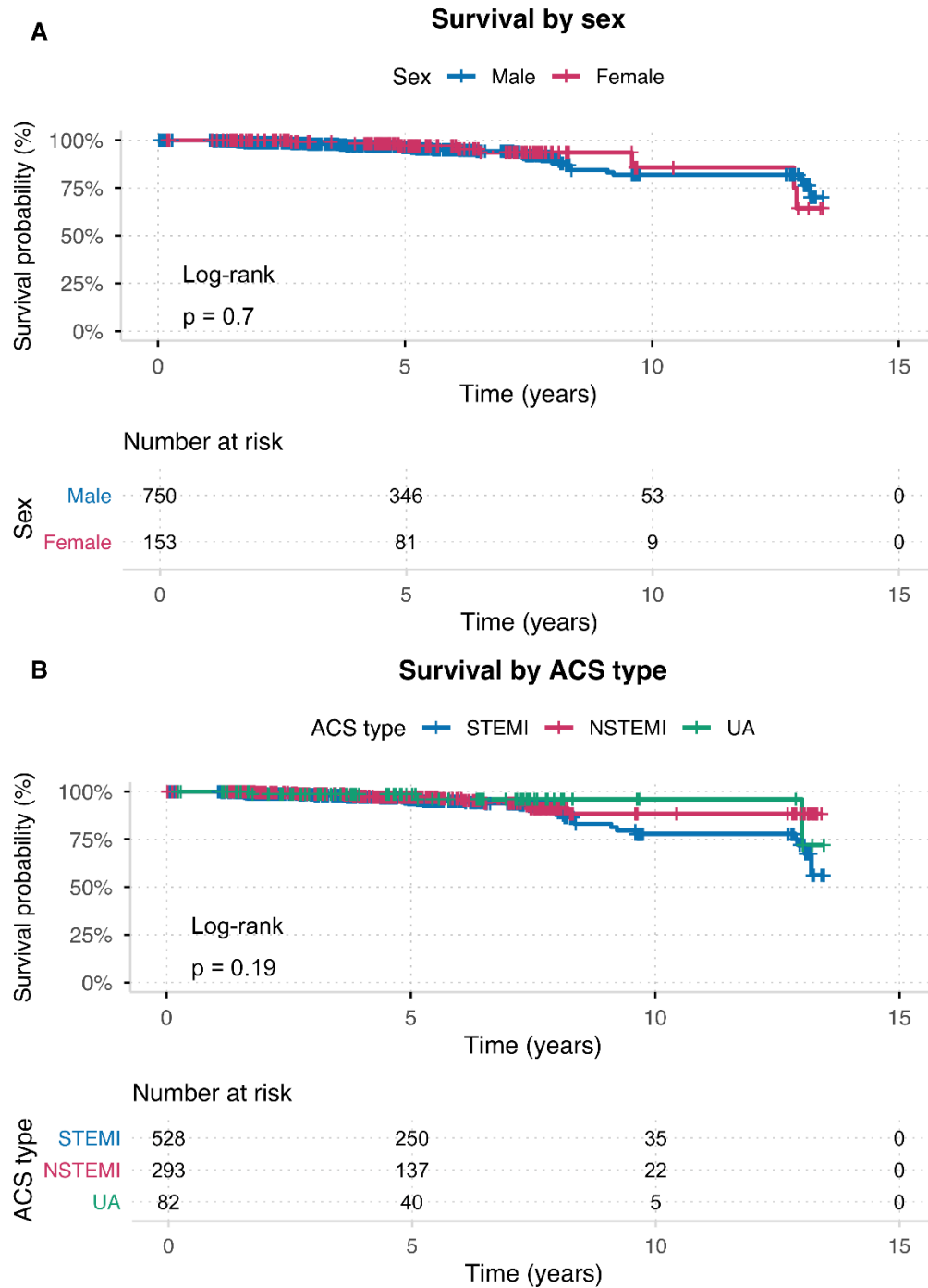


Fig. S3 Kaplan-Meier survival curves according to demographic and clinical presentation variables. (A) Sex and (B) ACS type. Survival distributions were compared using the log-rank test. Statistical significance was defined as $p < 0.05$.

Supplementary Figure S4

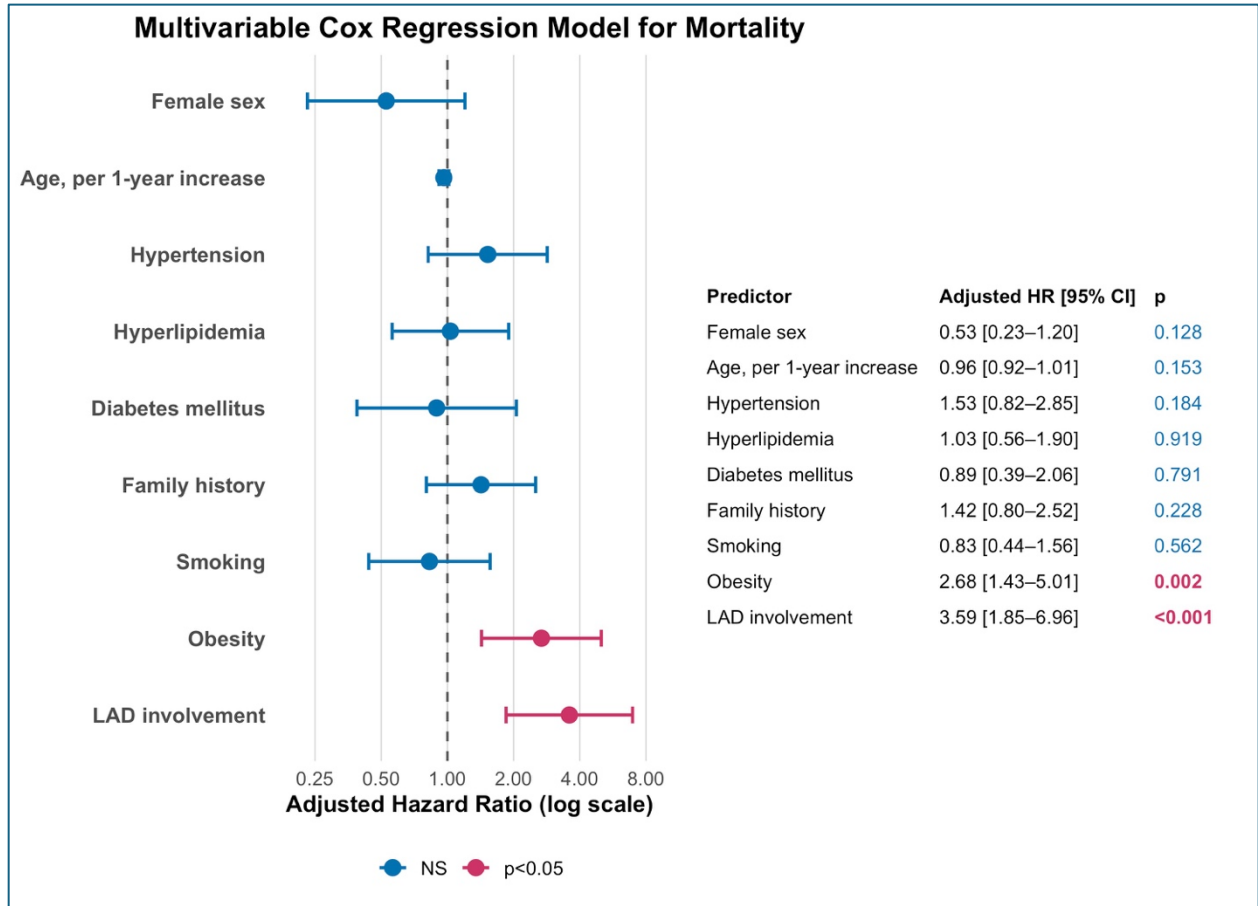


Fig. S4 Forest plot of full-follow-up multivariable Cox regression model for mortality. Adjusted hazard ratios and 95% confidence intervals are shown for predictors included in the multivariable Cox regression model. Obesity and LAD involvement remained independently associated with mortality. Statistical significance was defined as $p < 0.05$.