Appendix 1

Methods

Participants and study design

Specific identification of the culprit lesions

At least 2 of the following morphological features suggestive of acute plaque rupture should be present:

(A) Intraluminal filling defects consistent with thrombus (i.e., acute occlusion abruptly ending with a squared-off or convex upstream termination, or an intraluminal filling defect in a patent vessel within or adjacent to a stenotic region with surrounding homogeneous contrast opacification);

(B) Plaque ulceration (i.e., presence of contrast and hazy contour beyond the vessel lumen);

(C) Plaque irregularity (i.e., irregular margins or overhanging edges), dissection, or impaired flow.

### Definition of cardiovascular risk factors

Baseline patient characteristics were collected from inpatient medical records. Clinical data on age, gender, body mass index (BMI), and cardiovascular risk factors were analyzed. The classification criteria for cardiovascular risk factors were as follows: (A) hypertension, defined as systolic blood pressure >140 mmHg and/or diastolic blood pressure >90 mmHg and/or use of antihypertensive drugs according to guidelines (37); (B) dyslipidemia, defined as a fasting total cholesterol >6.2 mmol/L, low-density lipoprotein cholesterol (LDL-C) >3.4 mmol/L, high-density lipoprotein cholesterol <1.0 mmol/L, serum triglycerides >1.7 mmol/L (outpatients only), or diagnosis/treatment of dyslipidemia (38); (C) diabetes mellitus, defined as a fasting blood glucose level ≥7.0 mmol/L or glycosylated hemoglobin (HbA1c) level ≥6.5% (39); (D) smoker, defined as current active or former smokers; and (E) family history of coronary artery disease, defined as a family history of ≥1 degree of consanguinity with coronary artery disease before the age of 60 (6); (F) additionally, patients with a BMI ≥28 kg/m^2 were considered obese.

Quantification measurement of imaging indicators

The Gensini score method (40) was used to assess the degree of coronary stenosis, with the most severe stenosis used as the site of stenosis for scoring. A stenosis diameter of <25% was scored as 1 point, 25–49% as 2 points, 50–74% as 4 points, 75–89% as 8 points, 90–99% as 16 points, and total occlusion as 32 points. The above scores were multiplied by a corresponding coefficient: 5 for the left main branch (LM); 2.5 and 1.5 for the proximal and middle segment of the LAD, respectively; 1 and 0.5 for the D1 and D2 in the diagonal branches, respectively; 2.5 and 1 for the proximal and distal segment lesions of the LCX, respectively; and 1 for the proximal, middle, distal, and posterior descending branch lesions of the RCA. The sum of the scores for each lesion is the patient's coronary stenosis total score.
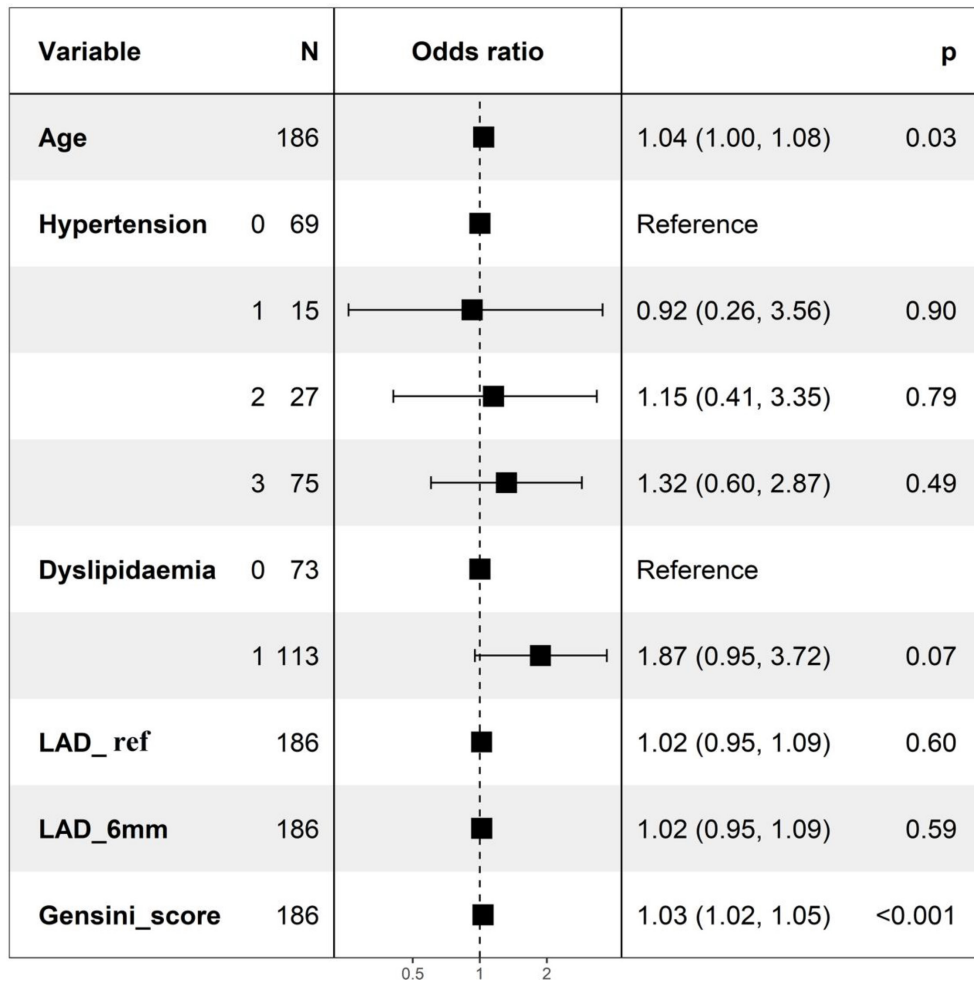
Results
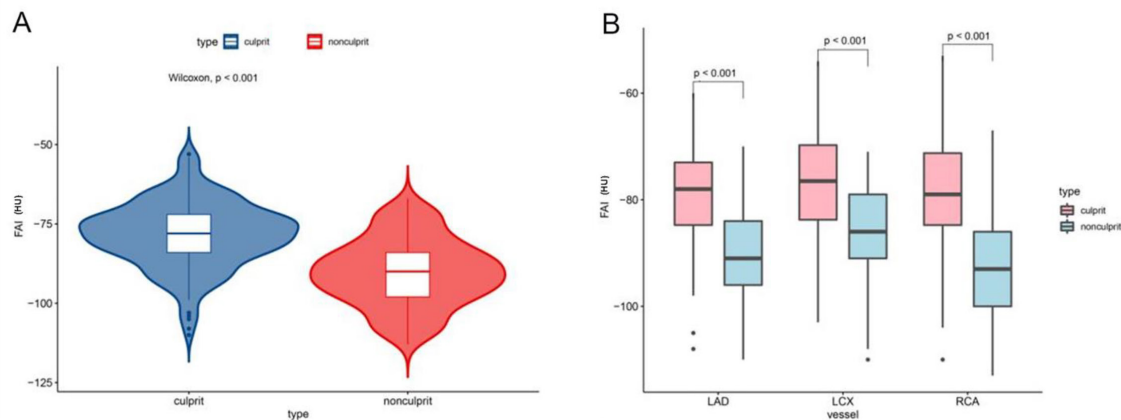
Figure S1 Comparison of FAI around culprit lesions and non-culprit lesions in patients with ACS. (A) Comparison of differences between all culprit lesions and non-culprit lesions in the group. (B) Comparison of the culprit and non-culprit lesions located within the same vessel across all vessels enrolled. FAI, fat attenuation index; ACS, acute coronary syndrome; LAD, left anterior descending artery; RCA, right coronary artery; LCX, left circumflex artery.
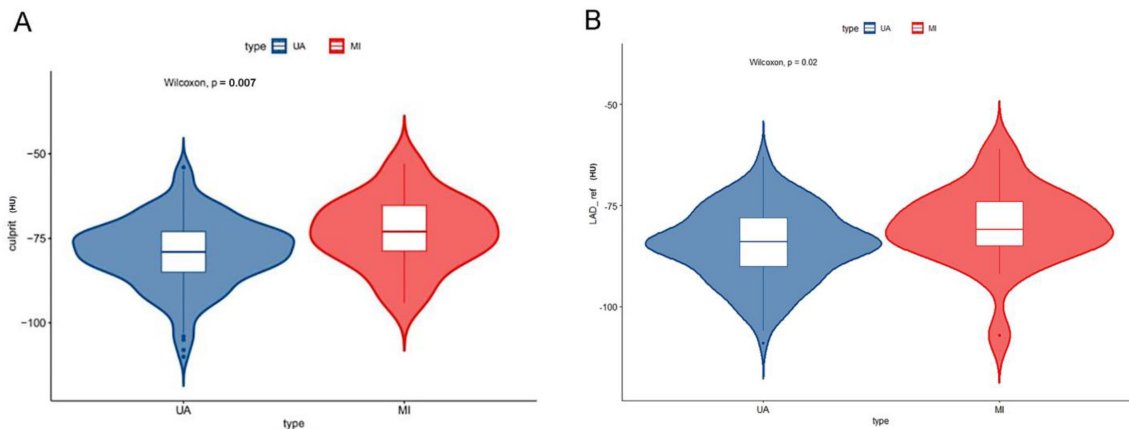
Figure S2 Comparison of FAI in patients with UA and MI. (A) Comparison of FAI around culprit lesions in patients with UA and MI. (B) Comparison of LAD_ref in patients with UA and MI. FAI, fat attenuation index; UA, unstable angina; MI, myocardial infarction; FAI, fat attenuation index; LAD_ref, FAI around the proximal LAD within reference diameter from the outer vessel wall.

Variable	N	Odds ratio		p
Age	186		1.04 (1.00, 1.08)	0.03
Hypertension	0 69		Reference	
	1 15		0.92 (0.26, 3.56)	0.90
	2 27		1.15 (0.41, 3.35)	0.79
	3 75		1.32 (0.60, 2.87)	0.49
Dyslipidaemia	0 73		Reference	
	1 113		1.87 (0.95, 3.72)	0.07
LAD_ref	186		1.02 (0.95, 1.09)	0.60
LAD_6mm	186		1.02 (0.95, 1.09)	0.59
Gensini_score	186		1.03 (1.02, 1.05)	<0.001

Figure S3 Forest plot of the model for identifying patients with ACS. ACS, acute coronary syndrome; LAD, left anterior descending artery; FAI, fat attenuation index; LAD_ref, FAI around the proximal LAD within reference diameter from the outer vessel wall; LAD_6mm, FAI around the proximal LAD within a 6-mm diameter from the outer vessel wall.

Table S1 Correlation of the FAI around culprit lesions with the FAI around different radial distances proximal to the coronary artery in patients with ACS

	r (95% CI)	P
RCA_2mm	0.473 (0.358–0.574)	<0.001
RCA_ref	0.540 (0.434–0.631)	<0.001
RCA_6mm	0.548 (0.443–0.638)	<0.001
LAD_2mm	0.438 (0.319–0.543)	<0.001
LAD_ref	0.587 (0.489–0.671)	<0.001
LAD_6mm	0.490 (0.377–0.589)	<0.001
LCX_2mm	0.484 (0.370–0.583)	<0.001
LCX_ref	0.586 (0.487–0.670)	<0.001
LCX_6mm	0.531 (0.423–0.623)	<0.001

FAI, fat attenuation index; ACS, acute coronary syndrome; RCA, right coronary artery; LAD, left anterior descending artery; LCX, left circumflex artery; RCA_2mm, FAI around the proximal RCA within a 2-mm diameter from the outer vessel wall; RCA_ref, FAI around the proximal RCA within reference diameter from the outer vessel wall; RCA_6mm, FAI around the proximal RCA within a 6-mm diameter from the outer vessel wall; LAD_2mm, FAI around the proximal LAD within a 2-mm diameter from the outer vessel wall; LAD_ref, FAI around the proximal LAD within reference diameter from the outer vessel wall; LAD_6mm, FAI around the proximal LAD within a 6-mm diameter from the outer vessel wall; LCX_2mm, FAI around the proximal LCX within a 2-mm diameter from the outer vessel wall; LCX_ref, FAI around the proximal LCX within reference diameter from the outer vessel wall; LCX_6mm, FAI around the proximal LCX within a 6-mm diameter from the outer vessel wall.

Table S2 Correlation of Gensini score with the FAI around different radial distances proximal to the coronary artery in all patients

	r (95% CI)	P
RCA_2mm	0.080 (–0.041 to 0.198)	0.19
RCA_ref	0.104 (–0.016 to 0.221)	0.09
RCA_6mm	0.096 (–0.024 to 0.214)	0.12
LAD_2mm	0.140 (0.020 to 0.256)	0.02
LAD_ref	0.148 (0.028 to 0.263)	0.02
LAD_6mm	0.147 (0.027 to 0.262)	0.02
LCX_2mm	0.160 (0.041 to 0.275)	0.009
LCX_ref	0.170 (0.051 to 0.285)	0.005
LCX_6mm	0.141 (0.021 to 0.257)	0.02

ACS, acute coronary syndrome; RCA, right coronary artery; LAD, left anterior descending artery; FAI, fat attenuation index; LCX, left circumflex artery; RCA_2mm, FAI around the proximal RCA within a 2-mm diameter from the outer vessel wall; RCA_ref, FAI around the proximal RCA within reference diameter from the outer vessel wall; RCA_6mm, FAI around the proximal RCA within a 6-mm diameter from the outer vessel wall; LAD_2mm, FAI around the proximal LAD within a 2-mm diameter from the outer vessel wall; LAD_ref, FAI around the proximal LAD within reference diameter from the outer vessel wall; LAD_6mm, FAI around the proximal LAD within a 6-mm diameter from the outer vessel wall; LCX_2mm, FAI around the proximal LCX within a 2-mm diameter from the outer vessel wall; LCX_ref, FAI around the proximal LCX within reference diameter from the outer vessel wall; LCX_6mm, FAI around the proximal LCX within a 6-mm diameter from the outer vessel wall.

Table S3 Logistic regression analysis of risk factors and PCAT attenuation in the proximal coronary associated with ACS

Characteristic	Univariable			Multivariable		
	OR	95% CI	P	OR	95% CI	P
Age	1.04	1.00–1.07	0.03	1.04	1.00-1.08	0.03
Gender						
0	Reference					
1	1.04	0.57–1.93	0.89	–	–	–
BMI	1.04	0.94–1.15	0.42	–	–	–
Obesity						
0	Reference					
1	1.22	0.54–2.77	0.63	–	–	–
Smoking						
0	Reference					
1	1.24	0.66–2.35	0.51	–	–	–
Drinking						
0	Reference					
1	1.02	0.45–2.36	0.95	–	–	–
Diabetes						
0	Reference					
1	1.15	0.59–2.24	0.68	–	–	–
Dyslipidemia						
0	Reference			Reference		
1	1.71	0.93–3.17	0.09	1.87	0.95–3.72	0.07
Family history						
0	Reference					
1	0.00	0.00–Inf	0.99	–	–	–
Hypertension						
0	Reference			Reference		
1	1.63	0.50–5.28	0.41	0.92	0.26–3.56	0.90
2	1.63	0.64–4.14	0.30	1.15	0.41–3.35	0.79
3	2.24	1.12–4.51	0.02	1.32	0.60–2.87	0.49
FAI around proximal coronary						
LAD_2mm	1.01	0.98–1.05	0.38	–	–	–
LAD_ref	1.03	1.00–1.07	0.05	1.02	0.95–1.09	0.60
LAD_6mm	1.03	1.00–1.07	0.09	1.02	0.95–1.09	0.59
LCX_2mm	1.00	0.97–1.04	0.86	–	–	–
LCX_ref	1.01	0.98–1.04	0.57	–	–	–

Table S3 (*continued*)

Table S3 (*continued*)

Characteristic	Univariable			Multivariable		
	OR	95% CI	P	OR	95% CI	P
LCX_6mm	1.02	0.98–1.05	0.33	–	–	–
RCA_2mm	1.01	0.98–1.04	0.65	–	–	–
RCA_ref	1.01	0.98–1.04	0.36	–	–	–
RCA_6mm	1.01	0.98–1.05	0.36	–	–	–
Gensini score	1.03	1.02–1.05	<0.001	1.03	1.02–1.05	<0.001

PCAT, pericoronary adipose tissue; OR, odds ratio; 95%CI, 95% confidence interval; BMI, body mass index; FAI, fat attenuation index; FAI, fat attenuation index; LCX, left circumflex artery; RCA_2mm, FAI around the proximal RCA within a 2-mm diameter from the outer vessel wall; RCA_ref, FAI around the proximal RCA within reference diameter from the outer vessel wall; RCA_6mm, FAI around the proximal RCA within a 6-mm diameter from the outer vessel wall; LAD_2mm, FAI around the proximal LAD within a 2-mm diameter from the outer vessel wall; LAD_ref, FAI around the proximal LAD within reference diameter from the outer vessel wall; LAD_6mm, FAI around the proximal LAD within a 6-mm diameter from the outer vessel wall; LCX_2mm, FAI around the proximal LCX within a 2-mm diameter from the outer vessel wall; LCX_ref, FAI around the proximal LCX within reference diameter from the outer vessel wall; LCX_6mm, FAI around the proximal LCX within a 6-mm diameter from the outer vessel wall.

References

37. Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M, Clement DL, Coca A, de Simone G, Dominiczak A, Kahan T, Mahfoud F, Redon J, Ruilope L, Zanchetti A, Kerins M, Kjeldsen SE, Kreutz R, Laurent S, Lip GYH, McManus R, Narkiewicz K, Ruschitzka F, Schmieder RE, Shlyakhto E, Tsioufis C, Aboyans V, Desormais I. 2018 ESC/ESH Guidelines for the management of arterial hypertension. Eur Heart J 2018;39:3021-104.
38. Jacobson TA, Ito MK, Maki KC, Orringer CE, Bays HE, Jones PH, McKenney JM, Grundy SM, Gill EA, Wild RA, Wilson DP, Brown WV. National lipid association recommendations for patient-centered management of dyslipidemia: part 1--full report. J Clin Lipidol 2015;9:129-69.
39. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2020. Diabetes Care 2020;43:S14-s31.
40. Liu R, Gao X, Liang S, Zhao H. Five-years' prognostic analysis for coronary artery ectasia patients with coronary atherosclerosis: A retrospective cohort study. Front Cardiovasc Med 2022;9:950291.