Supplementary

Appendix 1 Study definitions

Angiographic definitions

Significant coronary lesions

The extent of coronary atherosclerosis was inferred from the distribution of significant coronary obstructions in the major epicardial arteries. A significant lesion was reported as a narrowing of the arterial lumen by ≥50% (34).

Lesion length

Lesion length was measured as a distance between seemingly healthy proximal and distal reference segments. Lesions were graded as discreet (<10 mm), tubular (10–20 mm), or diffuse (>20 mm) (11).

Proximal *vs.* distal lesions

Coronary lesions were located in 15 segments according to the American Heart Association reporting system (12). The lesions originating in the segments 1, 2, 5, 6, 7, 11, and 12 were considered proximal and the remaining distal.

Coronary blood flow

The levels of post-procedural coronary blood flow were assessed by the Thrombolysis in Myocardial Infarction (TIMI) Grade Flow scoring system (13). Grade 0 referred to the absence of any antegrade flow beyond the coronary obstruction; Grade 1 was a faint antegrade flow with incomplete distal filling; Grade 2 was a delayed antegrade flow with complete distal filling; and Grade 3 was the normal antegrade flow.

Edge dissections

Post-procedural edge dissections were categorized according to the National Heart, Lung, and Blood Institute classification system (14). Type A was a minor intra-luminal radiolucent area; Type B was a radiolucent flap that ran parallel with the lumen; in Type C, contrast appeared as a persistent extraluminal flap; in Type D, contrast showed as a persistent spiral filling defect; in Type E, new and persistent defects developed in the vessel lumen; in Type D, all the dissections caused the distal blood flow and progressed to total occlusions.

Optical coherence tomography (OCT) definitions

Normal coronary artery wall

A normal coronary artery wall was defined as a three-layered structure comprising a high back-scattering intima, a low back-scattering media, and a high back-scattering adventitia. The internal elastic membrane (IEM) was defined as the border between the intima and media, and the external elastic membrane (EEM) as the border between the media and adventitia. The maximal intimal thickness was not to exceed 300 μm (3,15,16).

Significant coronary lesions

A coronary lesion was seen as a mass lesion, focal intimal thickening of ≥600 μm, and/or loss of three-layered architecture (3). A significant lesion was defined as a decrease of luminal cross-sectional area by ≥50% compared with the largest reference segment area (3,35).

Proximal reference segments

The proximal reference segment by luminal approach was considered the site with the largest lumen proximal to a stenosis but within the same segment (i.e., usually within 10 mm of the stenosis). This was not necessarily the site with the least plaque (3,35). The proximal segment by the EEM approach was considered the site proximal to a stenosis with ≥180° of EEM visible (20).

Distal reference segments

The distal reference segment by luminal approach was considered the site with the largest lumen distal to a stenosis but within

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the same segment (i.e., usually within 10 mm of the stenosis). This was not necessarily the site with the least plaque (3,35). The distal reference segment by EEM approach was considered the site distal to a stenosis with ≥180° of EEM visible (20).

Lesion border detection

An acceptable OCT visibility was deemed if ≥50% (≥180°) of the reference segment circumference was detected (15,36).

Lesion length

By luminal-based approach (LBA), lesion length was the distance from proximal to distal reference sites using the OCT automated lumen detection feature. By EEM-based approach (EBA), lesion length was determined as the distance from proximal to distal reference site when the border visibility was acceptable (≥180°) (20).

Atherosclerotic plaque types

Atherosclerotic plaques were classified as fibrous plaques, fibro-calcific plaques, and fibroatheromas. All diagnoses were made at the cross-sectional level, and the dominant type provided the basis for the classification (16).

Fibrous plaques

A fibrous plaque was defined as a high backscattering and relatively homogeneous intimal thickening of ≥600 µm with lipid pools or calcifications involving <1 quadrant in the cross-section (3,16).

Fibro-calcific plaques

A fibrocalcific plaque was characterized by the evidence of sharply delineated signal-poor calcifications, embedded in signal-rich fibrous tissue and extending > 1 quadrant in the cross-section (3,16).

Fibroatheromas

A fibroatheroma was defined as a lesion with an OCT-delineated fibrous cap and a necrotic core. The necrotic core was seen as a diffusely demarcated signal-poor region with high light attenuation and involving >1 quadrant in the cross-section (3,16). A thick-capped fibroatheroma (ThCFA) was defined as a fibroatheroma with a delineated necrotic core and an overlying fibrous cap with a thickness of ≥65 µm (3). A thin-capped fibroatheroma (TCFA) was defined as a lipid-rich plaque with a fibrous cap thickness of <65 µm and a maximum lipid arc >90° (35).

Ruptured plaques

A ruptured plaque was a fibroatheroma that showed features of intimal tearing, disruption, or dissection of the cap and a cavity formation inside the plaque (3).

Plaque erosions

Plaque erosion was composed of OCT evidence of thrombus, irregular luminal surface, and no evidence of cap rupture evaluated in multiple adjacent frames (3).

Thrombi

A thrombus was a mass attached to the luminal surface or floating within the lumen. Red thrombus was highly backscattering and had a high signal attenuation, while white thrombus was less backscattering, homogeneous, and had low signal attenuation (3).

Plaque burden

The EEM, visible for ≥220° of the vessel wall circumference, was a surrogate marker for plaque burden <40% (9).

Stent edges

Stent edge was defined as the first or last cross-section exhibiting visible struts in a circumference of <360°. The first and last cross-sections with visible struts in a circumference of 360° were defined as the stented segment. Cross sections 5-mm proximal or distal to stent edges were considered as the marginal segments (37).

Edge dissections

An edge dissection was defined as a disruption of the luminal vessel surface in the edge segments within 5 mm proximal and distal to the stent. Major edge dissections were considered dissections with ≥60° of the circumference of the vessel at the site of dissection and/or ≥3 mm in length. Smaller injuries were judged as minor dissections (16).

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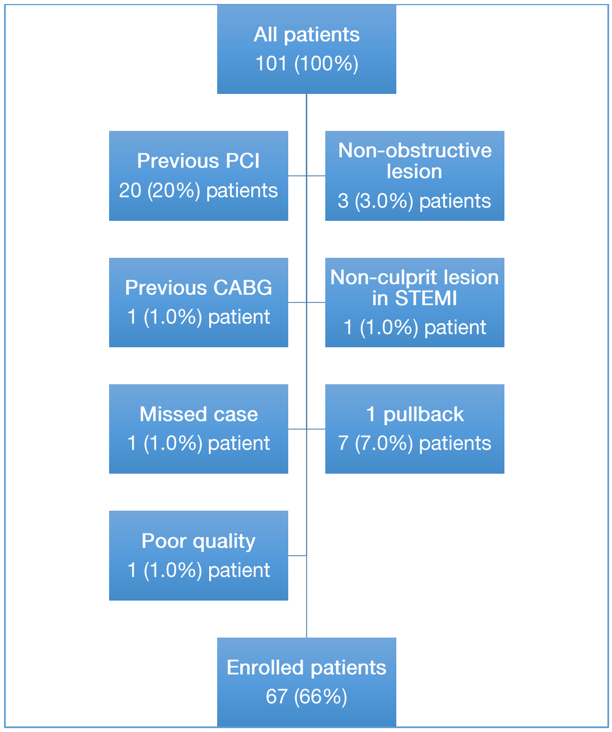

Figure S1 Flow chart of the patient enrollment in the study. Out of 101 patients planned for single culprit vessel PCI having OCT imaging, 67 (66%) patients were enrolled in the study. The entry criteria were: single-vessel culprit lesion PCI, baseline and post-stenting OCT pullbacks, no previous PCI/CABG of the culprit vessel, and adequate imaging quality. PCI, percutaneous coronary intervention; CABG, coronary artery bypass graft; STEMI, ST-segment elevation myocardial infarction; OCT, optical coherence tomography.

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Table S1 Visibility of external elastic membrane in reference and adjacent marginal segments

Variable	All patients (n=67)	Group 1 (n=34)	Group 2 (n=33)	P value
Proximal RS, n (%)				
≥220°	19 (28.4)	7 (20.6)	12 (36.4)	0.152
≥180°	45 (67.2)	24 (70.6)	21 (63.6)	0.545
<180°	22 (32.8)	10 (29.4)	12 (36.4)	0.545
Proximal AMS 1, n (%)				
≥220°	20 (29.9)	10 (29.4)	10 (30.3)	0.936
≥180°	44 (65.7)	24 (70.6)	20 (60.6)	0.390
<180°	23 (34.3)	10 (29.4)	13 (39.4)	0.390
Proximal AMS 2, n (%)				
≥220°	14 (20.9)	8 (23.5)	6 (18.2)	0.590
≥180°	45 (67.2)	26 (76.5)	19 (57.5)	0.100
<180°	22 (32.8)	8 (23.5)	14 (42.4)	0.100
Proximal AMS 3, n (%)				
≥220°	14 (20.9)	5 (14.7)	9 (27.2)	0.206
≥180°	33 (49.3)	25 (73.5)	13 (39.4)	0.112
<180°	34 (50.7)	14 (41.2)	20 (58.8)	0.112
Proximal AMS 4, n (%)				
≥220°	12 (17.9)	4 (11.8)	8 (24.2)	0.507
≥180°	34 (50.7)	18 (52.9)	16 (48.5)	0.715
<180°	33 (49.3)	16 (47.0)	17 (51.6)	0.544
Proximal AMS 5, n (%)				
≥220°	13 (19.4)	6 (17.7)	7 (21.2)	0.712
≥180°	34 (50.7)	19 (55.9)	15 (45.4)	0.273
<180°	33 (49.3)	15 (44.1)	18 54.6)	0.273
Distal RS, n (%)				
≥220°	21 (31.3)	12 (35.3)	9 (27.2)	0.479
≥180°	37 (55.2)	18 (52.9)	19 (57.6)	0.703
<180°	30 (44.8)	16 (47.0)	14 (42.4)	0.703
Distal AMS 1, n (%)				
≥220°	22 (32.8)	12 (35.3)	10 (30.3)	0.664
≥180°	42 (62.7)	23 (67.6)	19 (57.6)	0.271
<180°	25 (37.3)	11 (32.3)	14 (42.4)	0.394
Distal AMS 2, n (%)				
≥220°	25 (37.3)	13 (38.2)	12 (36.4)	0.882
≥180°	42 (62.7)	23 (67.6)	19 (57.6)	0.394
<180°	25 (37.3)	11 (32.3)	14 (42.4)	0.394
Distal AMS 3, n (%)				
≥220°	24 (35.8)	12 (35.3)	12 (36.4)	0.927
≥180°	44 (65.7)	23 (67.6)	21 (63.6)	0.730
<180°	23 (34.3)	11 (32.3)	12 (36.4)	0.730
Distal AMS 4, n (%)				
≥220°	26 (38.8)	12 (35.3)	14 (42.4)	0.549
≥180°	48 (71.6)	23 (67.6)	25 (75.7)	0.462
<180°	19 (28.4)	11 (32.3)	8 (27.2)	0.462
Distal AMS 5, n (%)				
≥220°	28 (41.8)	12 (35.3)	16 (48.4)	0.274
≥180°	49 (73.1)	22 (64.7)	27 (81.8)	0.114
<180°	18 (26.9)	12 (35.3)	6 (18.2)	0.114

Groups 1 and 2 are compared using χ^2 test. Group 1, patients with acute myocardial infarction; Group 2, patients with stable coronary artery disease. RS, reference segment; AMS 1 – 5, adjacent marginal segment 1 mm to 5 mm beyond the RS.

Table S2 Qualitative optical coherence tomography characteristics

Variable	All patients (n=67)	Group 1 (n=34)	Group 2 (n=33)	P value
Proximal RS, n (%)				0.539
N	6 (9.0)	2 (5.8)	4 (12.1)	
FP	33 (49.3)	18 (52.9)	15 (45.4)	
ThCFA	7 (10.4)	4 (12.1)	3 (9.1)	
TCFA	2 (3.0)	2 (5.8)	0 (0)	
FCP	19 (28.3)	8 (23.5)	11 (33.3)	
Minimal area, n (%)				<0.001
N	0 (0)	0 (0)	0 (0)	
FP	12 (17.9)	2 (5.9)	10 (30.3)	
ThCFA	11 (16.4)	3 (8.8)	8 (24.3)	
TCFA	24 (35.8)	23 (67.6)	1 (3.0)	
FCP	17 (25.4)	4 (11.8)	13 (39.4)	
Calc Nod	3 (4.5)	2 (5.9)	1 (3.0)	
Distal RS, n (%)				0.608
N	9 (13.5)	5 (14.7)	4 (12.1)	
FP	29 (43.3)	16 (47.2)	13 (39.4)	
ThCFA	8 (11.9)	3 (8.8)	5 (15.2)	
TCFA	2 (3.0)	2 5.8)	0 (0)	
FCP	19 (28.3)	8 (23.5)	11 (33.3)	

Groups 1 and 2 are compared using χ^2 test. Group 1, patients with acute myocardial infarction; Group 2, patients with stable coronary artery disease. RS, reference segment; N, normal vessel wall; FP, fibrous plaque; ThCFA, thick-cap fibroatheroma; TCFA, thin-cap fibroatheroma; FCP, fibrocalcific plaque; Calc Nod, calcified nodule.

Table S3 Plaques in adjacent marginal segments 1 (i.e., 1 mm beyond the reference segment)

Variable	All patients (n=67)	Group 1 (n=34)	Group 2 (n=33)	P value
Prox AMS, n (%)				0.269
N	6 (9.0)	2 (5.9)	4 (12.1)	
FP	27 (40.3)	16 (47.1)	11 (33.3)	
ThCFA	14 (20.9)	8 (23.5)	6 (18.2)	
TCFA	2 (2.9)	2 (5.9)	0 (0)	
FCP	18 (26.9)	6 (17.6)	12 (36.4)	
Dist AMS, n (%)				0.817
N	9 (13.5)	6 (17.7)	3 (9.1)	
FP	30 (44.8)	15 (44.1)	15 (45.5)	
ThCFA	7 (10.4)	4 (11.8)	3 (9.1)	
TCFA	0 (0)	0 (0)	0 (0)	
FCP	21 (31.3)	9 (26.5)	12 (36.4)	

Groups 1 and 2 are compared using χ^2 test. Group 1, patients with acute myocardial infarction; Group 2, patients with stable coronary artery disease. Prox AMS 1, proximal adjoining marginal segment 1 mm beyond the reference segment; Dist AMS, distal adjacent marginal segment; N, normal; FP, fibrous plaque; ThCFA, thick-cap fibroatheroma; TCFA, thin-cap fibroatheroma; FCP, fibrocalcific plaque.

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Table S4 Plaques in adjacent marginal segments 2 (i.e., 2 mm beyond the reference segment)

Variable	All patients (n=67)	Group 1 (n=34)	Group 2 (n=33)	P value
Prox AMS 2, n (%)				0.295
N	6 (9.0)	2 (5.9)	4 (12.1)	
FP	24 (35.8)	14 (41.2)	10 (30.3)	
ThCFA	13 (19.4)	7 (20.6)	6 (18.2)	
TCFA	3 (4.5)	3 (8.8)	0 (0)	
FCP	21 (31.3)	8 (23.5)	13 (39.4)	
Dist AMS 2, n (%)				0.319
N	9 (13.5)	6 (17.7)	3 (9.1)	
FP	26 (38.8)	15 (44.1)	11 (33.3)	
ThCFA	7 (10.4)	3 (8.8)	4 (12.1)	
TCFA	2 (3.0)	2 (5.9)	0 (0)	
FCP	23 (34.3)	8 (23.5)	15 (45.5)	

Groups 1 and 2 are compared using χ^2 test. Group 1, patients with acute myocardial infarction; Group 2, patients with stable coronary artery disease. Prox AMS, proximal adjacent marginal segment; Dist AMS, distal adjacent marginal segment; N, normal; FP, fibrous plaque; ThCFA, thick-cap fibroatheroma; TCFA, thin-cap fibroatheroma; FCP, fibrocalcific plaque.

Table S5 Plaques in adjacent marginal segments 3 (i.e., 3 mm beyond the reference segment)

Variable	All patients (n=67)	Group 1 (n=34)	Group 2 (n=33)	P-value
Prox AMS 3, n (%)				.434
N	7 (10.5)	3 (8.8)	4 (12.1)	
FP	23 (34.3)	13 (38.2)	10 (30.3)	
ThCFA	14 (20.9)	8 (23.5)	6 (18.2)	
TCFA	2 (3.0)	2 (5.9)	0 (0)	
FCP	21 (31.3)	8 (23.5)	13 (39.4)	
Dist AMS 3, n (%)				.946
N	9 (13.5)	6 (17.7)	3 (8.8)	
FP	26 (38.8)	13 (38.2)	13 (38.2)	
ThCFA	10 (14.9)	5 (14.7)	5 (14.7)	
TCFA	2 (3.0)	1 (2.9)	1 (2.9)	
FCP	20 (29.9)	9 (26.5)	11 (37.4)	

Groups 1 and 2 are compared using χ^2 test. Group 1, patients with acute myocardial infarction; Group 2, patients with stable coronary artery disease. Prox AMS, proximal adjacent marginal segment; Dist AMS, distal adjacent marginal segment; N, normal; FP, fibrous plaque; ThCFA, thick-cap fibroatheroma; TCFA, thin-cap fibroatheroma; FCP, fibrocalcific plaque.

Table S6 Plaques in adjacent marginal segments 4 (i.e., 4 mm beyond the reference segment)

Variable	All patients (n=67)	Group 1 (n=34)	Group 2 (n=33)	P value
Prox AMS 4, n (%)				0.291
N	7 (10.5)	3 (8.8)	4 (12.1)	
FP	26 (38.8)	15 (44.1)	11 (32.3)	
ThCFA	10 (14.9)	6 (17.6)	4 (12.1)	
TCFA	3 (4.5)	3 (8.8)	0 (0)	
FCP	21 (31.3)	7 (20.6)	14 (42.4)	
Dist AMS 4, n (%)				0.919
N	9 (13.5)	6 (17.7)	3 (9.1)	
FP	27 (40.3)	14 (41.2)	13 (39.4)	
ThCFA	8 (11.9)	4 (11.8)	4 (12.1)	
TCFA	2 (3.0)	1 (2.9)	1 (3.0)	
FCP	21 (31.3)	9 (26.5)	12 (36.4)	

Groups 1 and 2 are compared using χ^2 test. Group 1, patients with acute myocardial infarction; Group 2, patients with stable coronary artery disease. Prox AMS, proximal adjacent marginal segment; Dist AMS, distal adjacent marginal segment; N, normal; FP, fibrous plaque; ThCFA, thick-cap fibroatheroma; TCFA, thin-cap fibroatheroma; FCP, fibrocalcific plaque.

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Table S7 Plaques in adjacent marginal segments 5 (i.e., 5 mm beyond the reference segment)

Variable	All patients (n=67)	Group 1 (n=34)	Group 2 (n=33)	P-value
Prox AMS 5, n (%)				.336
N	6 (9.0)	2 (5.9)	4 (12.1)	
FP	26 (38.8)	15 (44.1)	11 (33.3)	
ThCFA	10 (14.9)	6 (17.6)	4 (12.1)	
TCFA	3 (4.5)	3 (8.8)	0 (0)	
FCP	22 (32.8)	8 (23.5)	14 (42.4)	
Dist AMS 5, n (%)				.752
N	9 (13.5)	6 (17.7)	3 (9.1)	
FP	25 (37.3)	13 (38.2)	12 (36.4)	
ThCFA	9 (13.4)	5 (14.7)	4 (12.1)	
TCFA	2 (3.0)	1 (8.8)	1 (3.0)	
FCP	22 (32.8)	9 (26.5)	13 (39.4)	

Groups 1 and 2 are compared using χ^2 test. Group 1, patients with acute myocardial infarction; Group 2, patients with stable coronary artery disease. Prox AMS, proximal adjacent marginal segment; Dist AMS, distal adjacent marginal segment; N, normal; FP, fibrous plaque; ThCFA, thick-cap fibro-atheroma; TCFA, thin-cap fibro-atheroma; FCP, fibrocalcific plaque.

Table S8 Predictors of periprocedural complications according to regression analysis

Variable	Univariate analysis			Multivariate analysis		
	OR	95% CI	P value	OR	95% CI	P value
Thrombolysis in myocardial infarction flow ≤3						
Hypertension, +	14.3	1.46–140.5	0.022			
STEMI, –	0.049	0.005–0.49	0.01	0.032	0.002–0.825	0.037
Patent culprit, +	0.130	0.02–0.87	0.038			
TCFA at RSs, –	0.087	0.01–0.073	0.025			
TCFA at prox. RSs, –	0.028	0.002–0.4	0.008			
Edge dissection						
Gender, male	3.37	1.09–10.38	0.035			
Hypertension, +	3.8	2.0–12.09	0.024			
Previous angina, +	5	1.28–19.53	0.021			
AMI, +	3.34	1.03–10.86	0.045			
STEMI, –	0.15	0.39–0.54	0.004			
Aspirin, previous	4.6	1.18–17.97	0.028			
Stent diameter, mm	3.98	1.12–14.11	0.032			

OR, odds ratio; CI, confidence interval; +, variable present; –, variable absent; STEMI, ST-elevation myocardial infarction; TCFA, thin-cap fibroatheroma; RSs, reference segments; prox, proximal; AMI, acute myocardial infarction.

