VH Findings in ACS vs. Stable Angina

Eun-Seok Shin M.D.,Ph.D.

Division of Interventional Cardiology,
Department of Internal Medicine,
Ulsan University Hospital,
University of Ulsan College of Medicine

Presenter Disclosure Information

Presenter: Eun-Seok Shin, M.D.,Ph.D.

Title: VH Findings in ACS vs. Stable Angina

No relationships to disclose

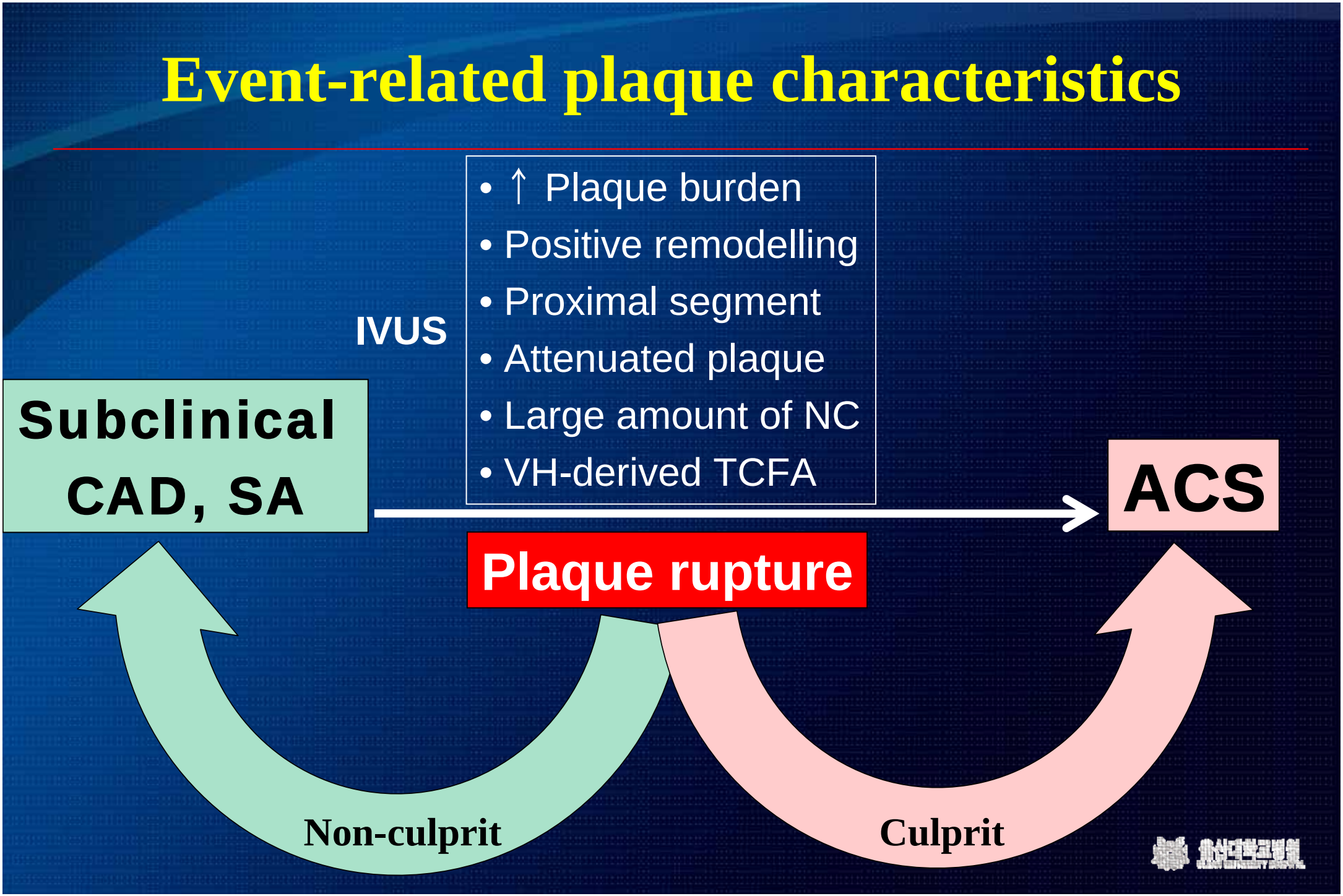
No industry sponsorship

VH-IVUS in ACS

- While there is a well-established relationship between degree of stenosis and plaque burden and ischemic symptoms in patients with stable angina, plaque composition, especially necrotic core, is more relevant in terms of occurrence of acute coronary syndromes.

- Virtual Histology-intravascular ultrasound, which permits the analysis of coronary plaque composition in vivo with high accuracy, is increasingly used in clinical research

Event-related plaque characteristics

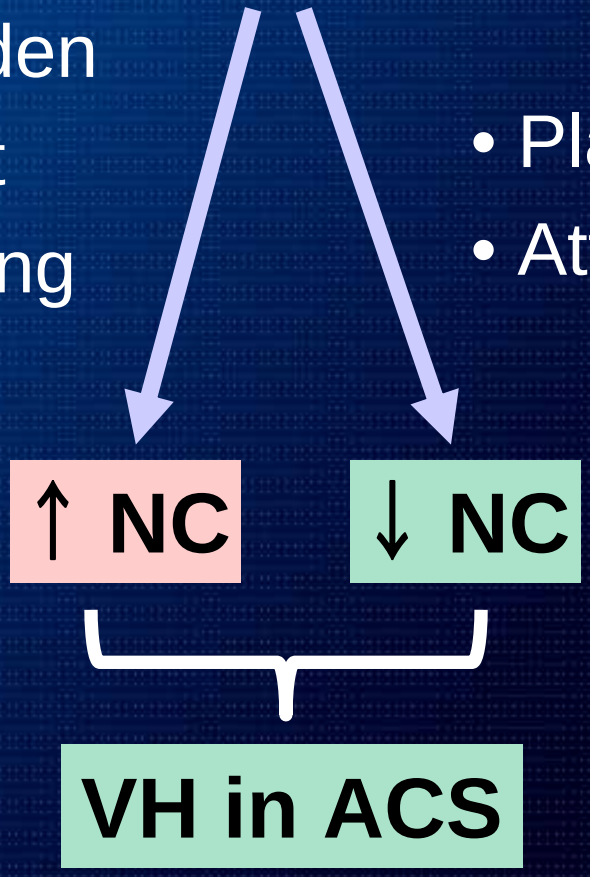


Various VH finding in ACS

event related plaque

- Large plaque burden
- Proximal segment
- Positive remodelling
- VH-derived TCFA

- Plaque rupture
- Attenuated plaque



Case 1

Patient Demographics

Age: 53

Gender: F

Risk factors: HTN, DM

Clinical Presentation

Sudden resting chest pain for 2 days

Initial Laboratory Findings

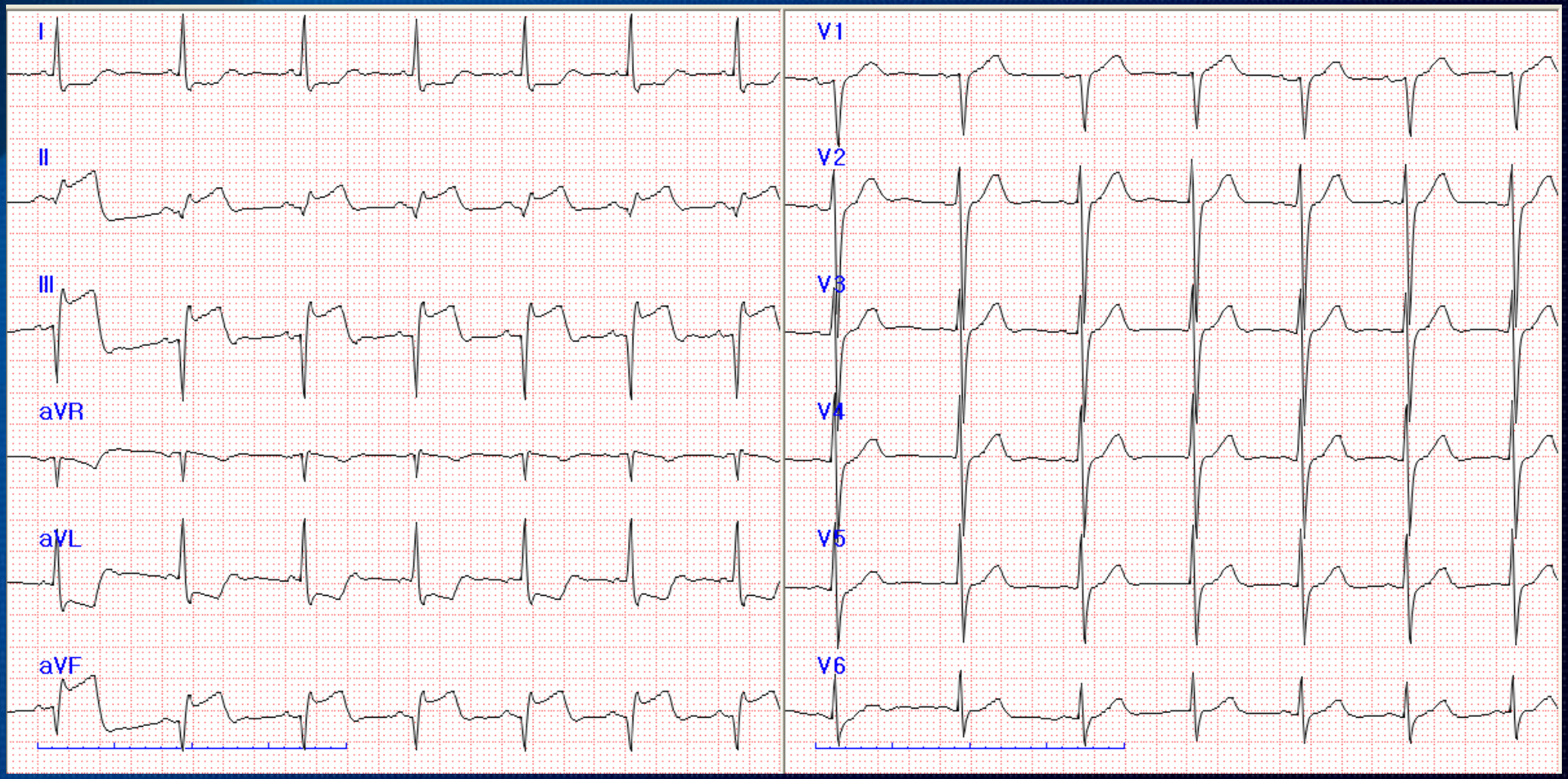
CK-MB	55.94	ng/ml
Troponin T	4.22	ng/ml
Troponin I	39.96	ng/ml

Lipid:	TC	201	mg/dl
	HDL	45	mg/dl
	TG	119	mg/dl
	LDL	98	mg/dl

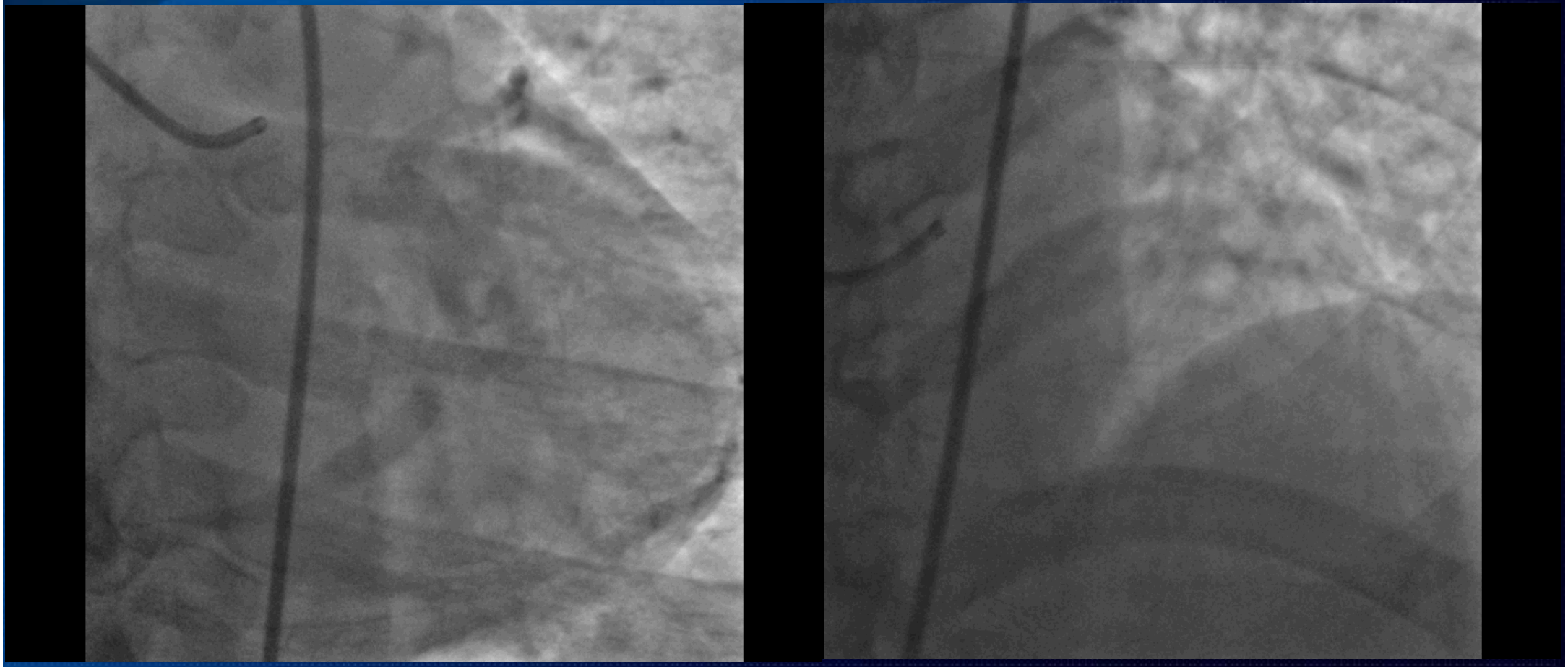
EchoCG: Akinesia without thinning of inferior,
Hypokinesia of basal inferoseptum with
RV dysfunction (EF 53%)

Initial ECG

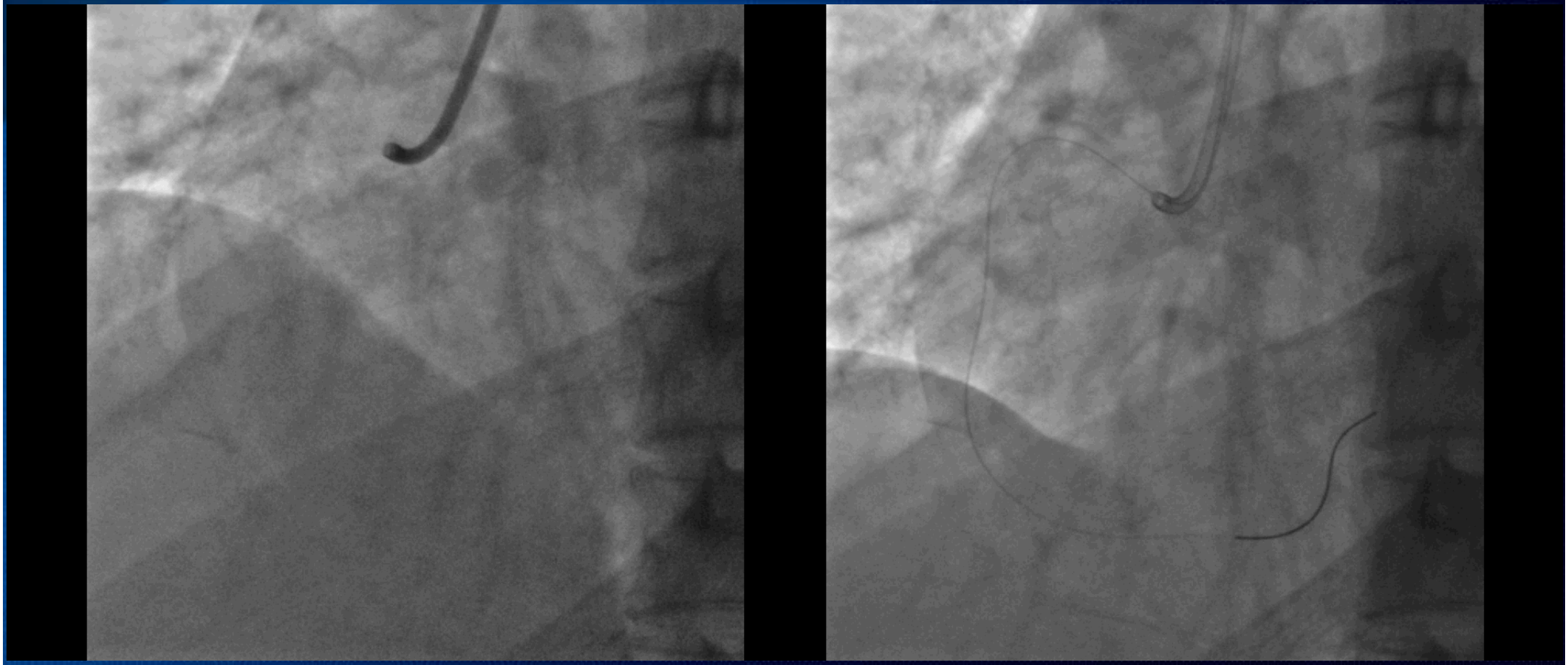
BP 90/60 mmHg



Baseline LCA

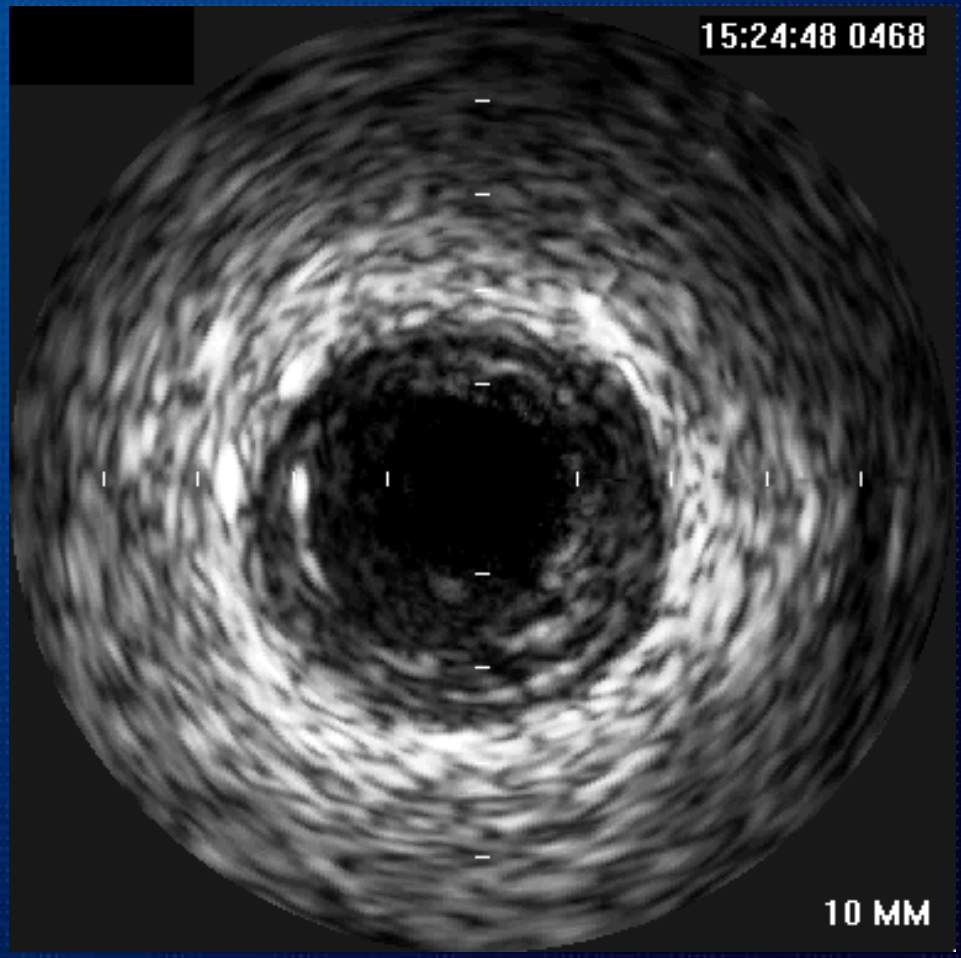


Baseline RCA & post-thrombectomy

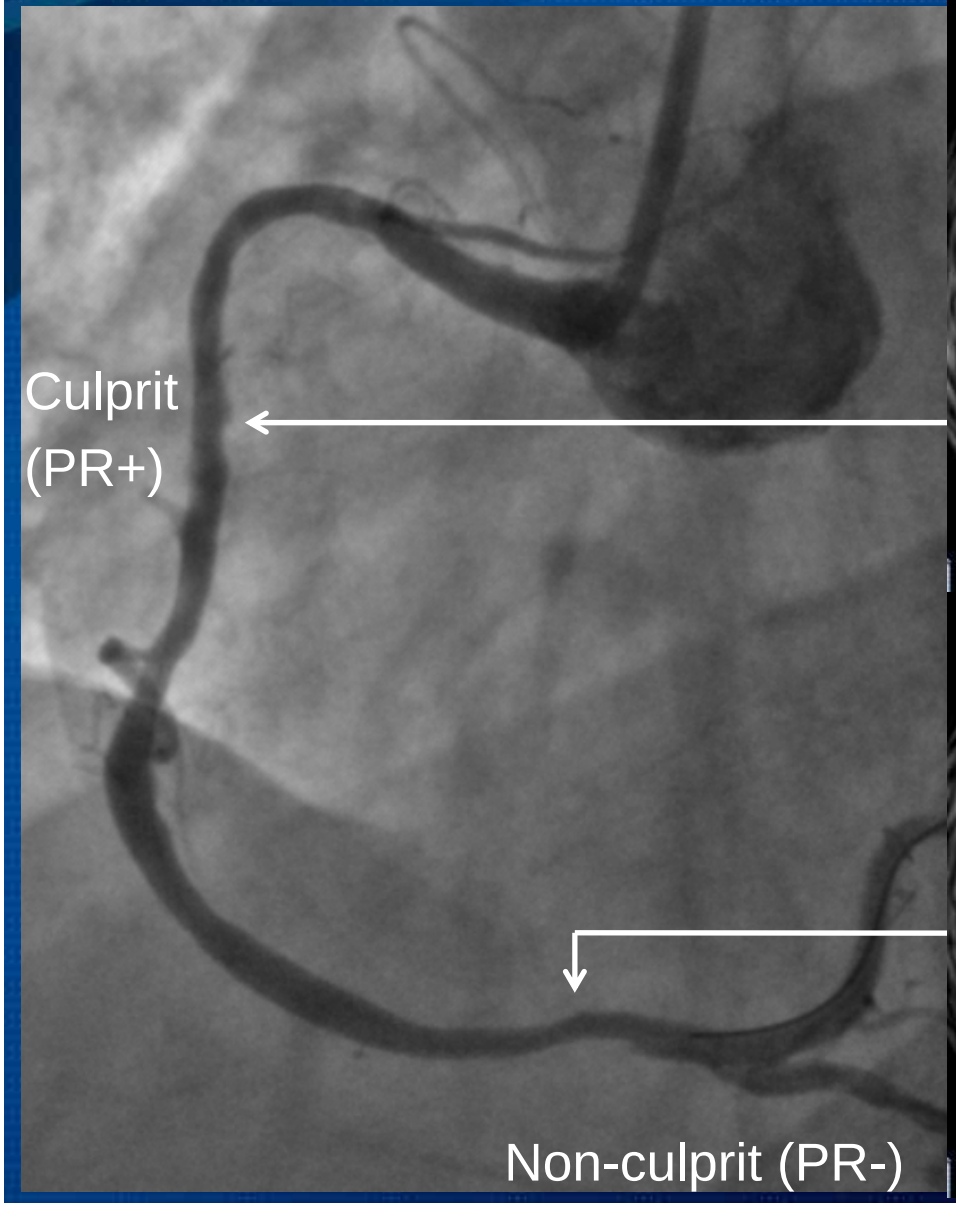


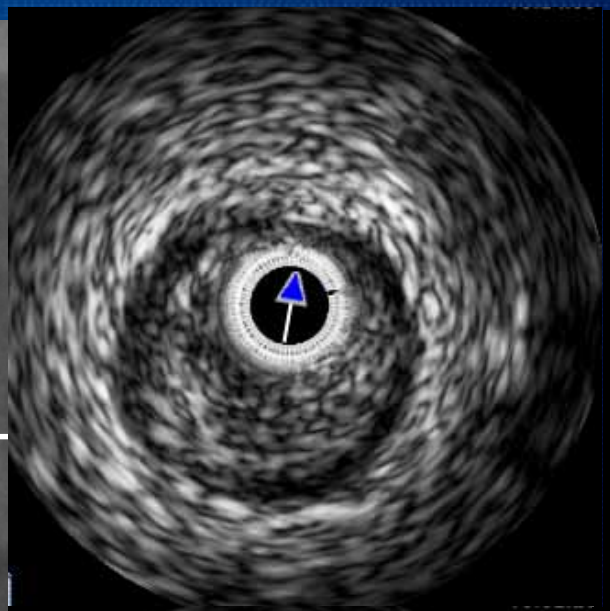
IVUS

Ruptured plaque with thrombi

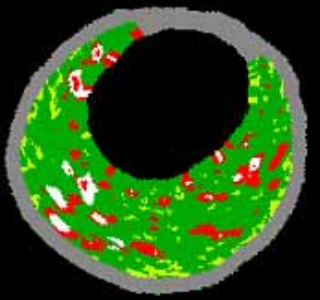


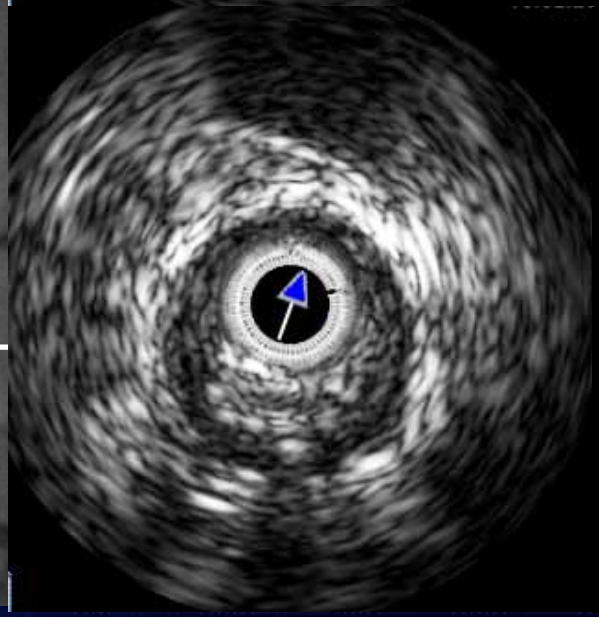
Baseline VH-IVUS



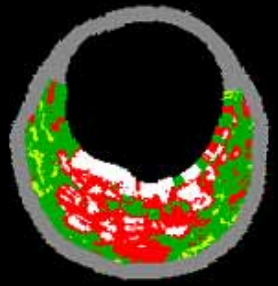


EEM = 17.1 mm²
PB = 72%
NC = 1.1 mm² (13%)

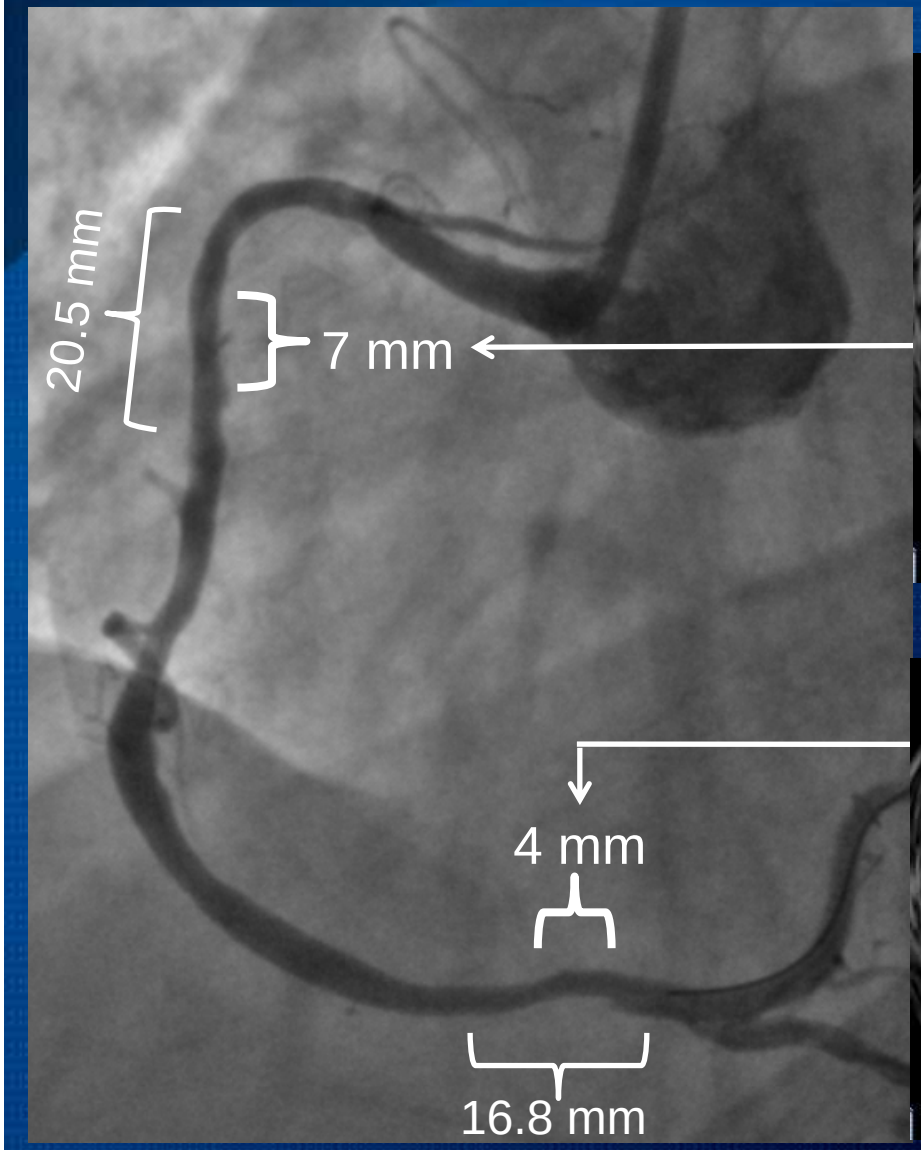


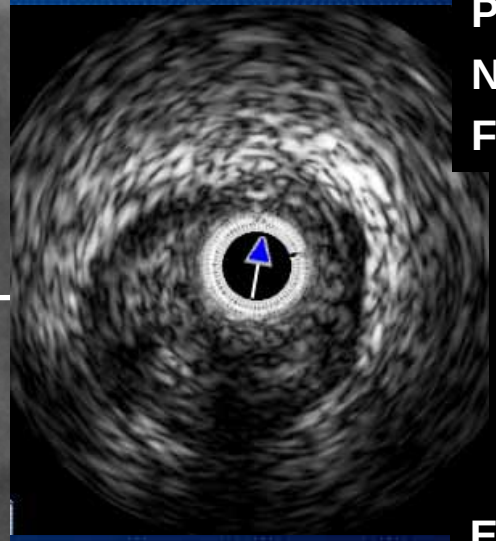


EEM = 14.0 mm²
PB = 63%
NC = 2.0 mm² (35%)

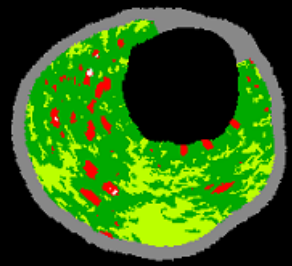


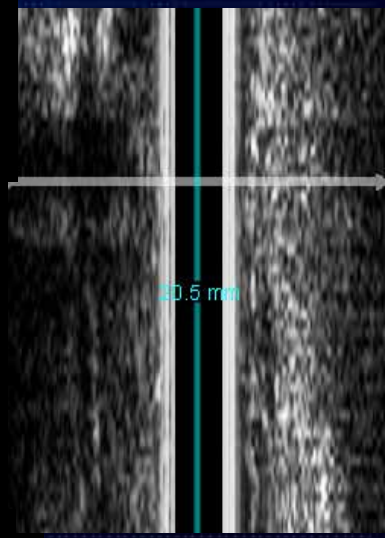
Multiple attenuated plaque in culprit vessel

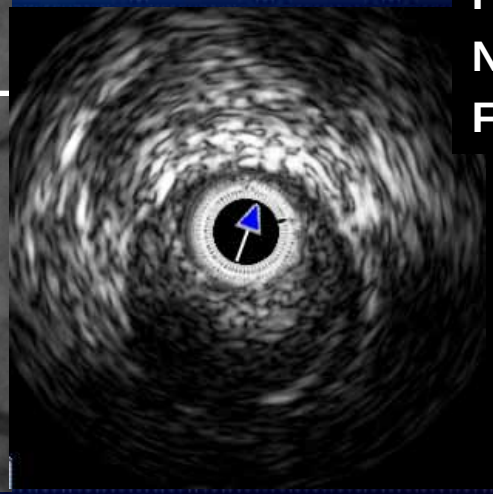




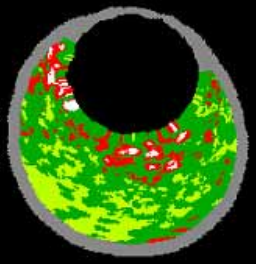
EEM = 18.0 mm²
PB = 79%
NC = 0.6 mm² (6%)
FF = 3.0 mm² (28%)

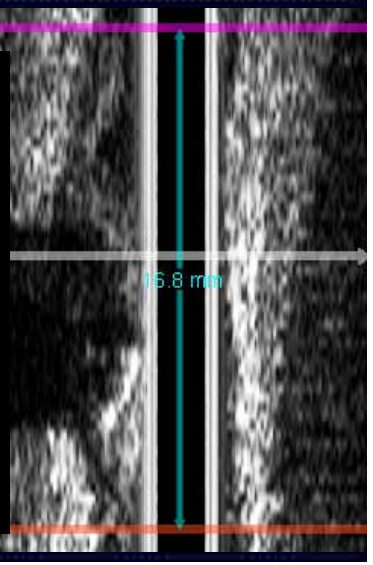




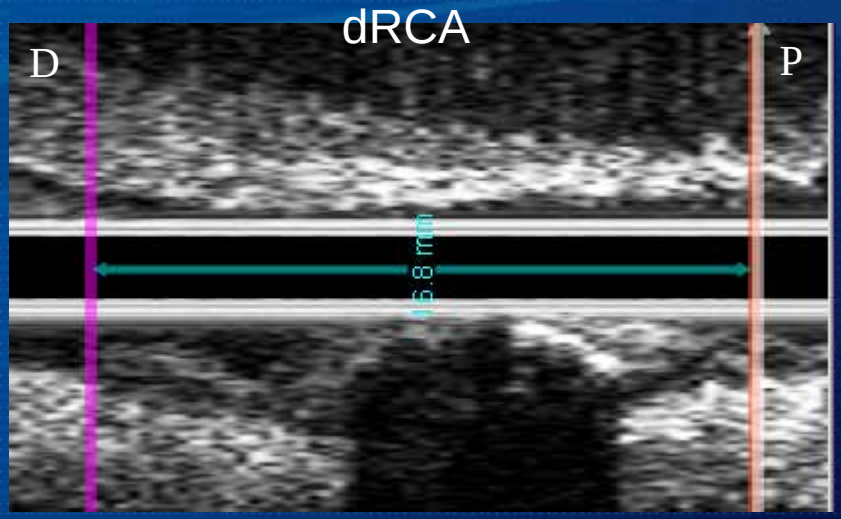


EEM = 16.7 mm²
PB = 74%
NC = 1.2 mm² (13%)
FF = 2.1 mm² (23%)

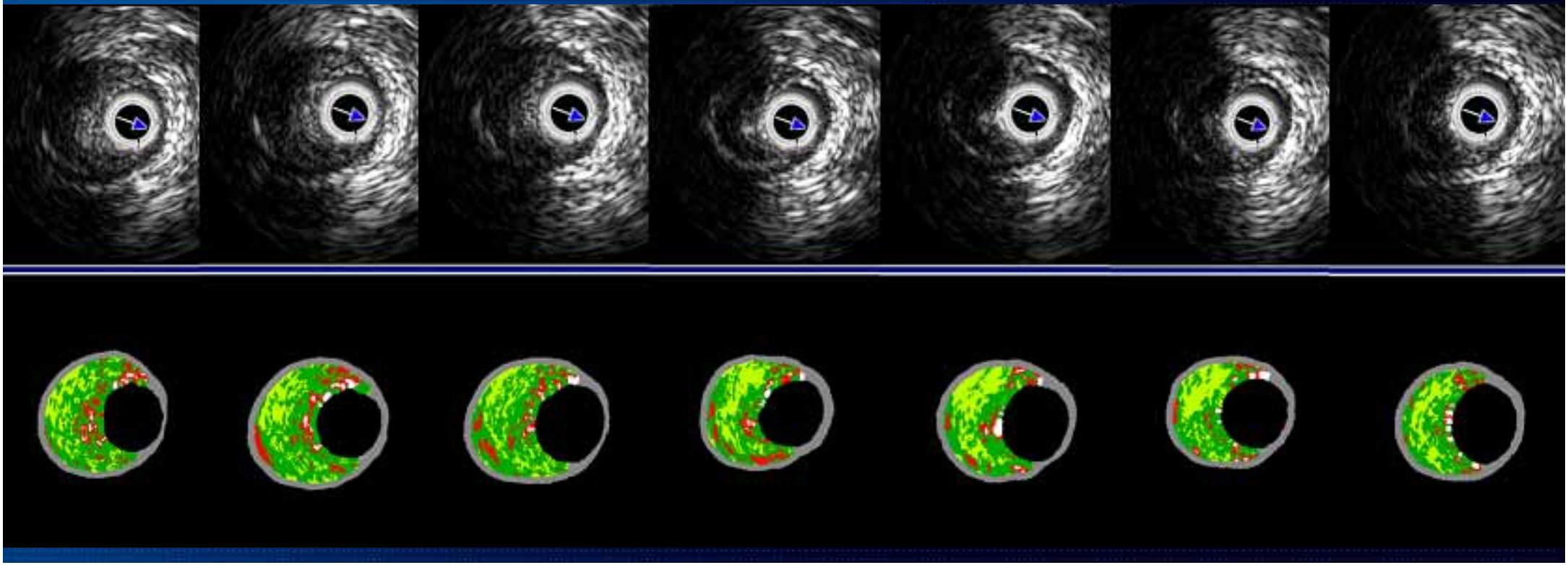




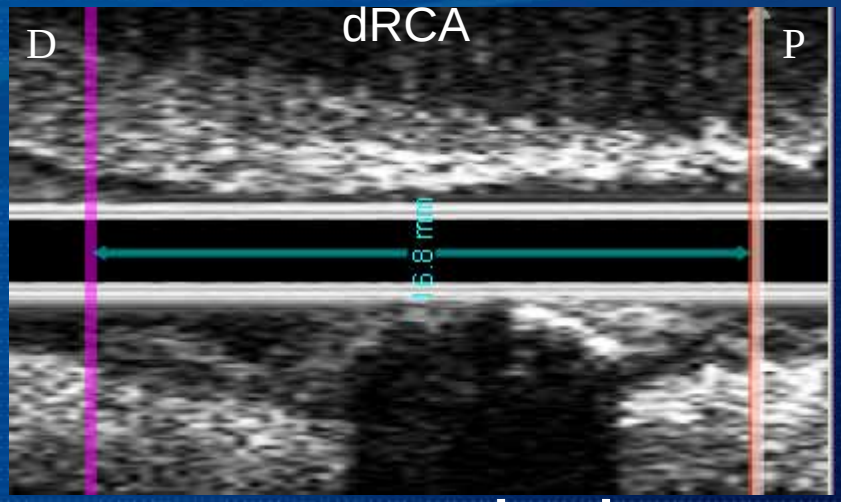
Non-culprit lesion



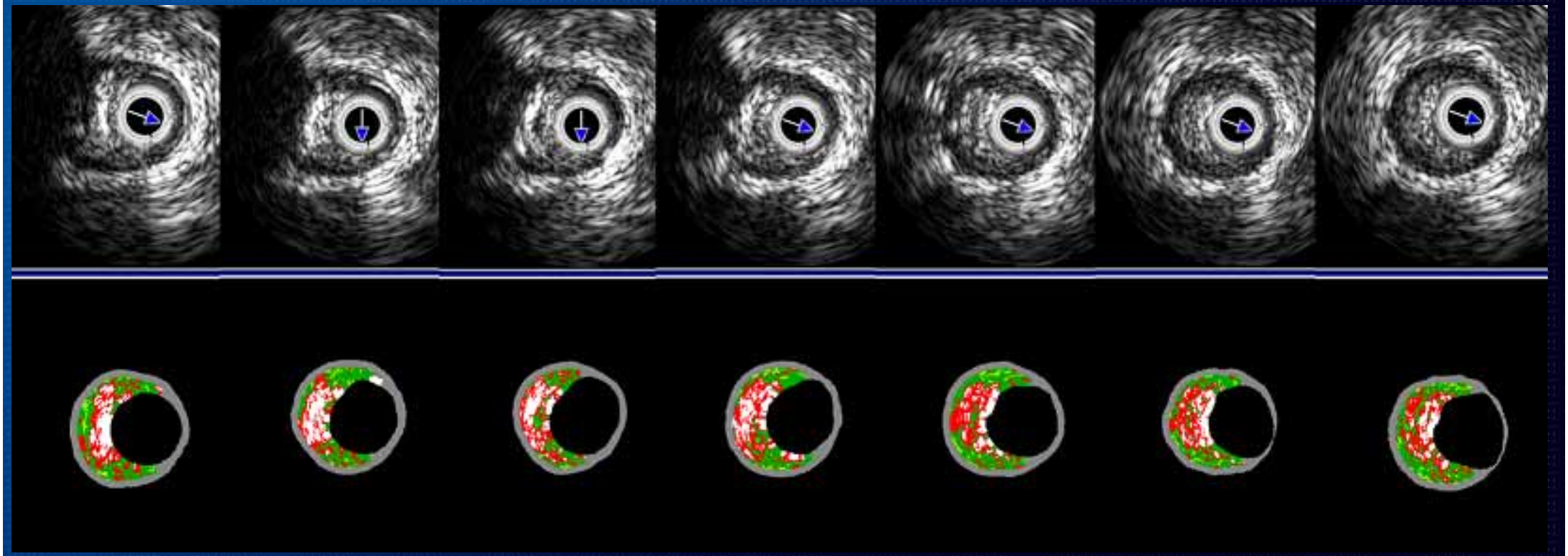
Attenuated plaque



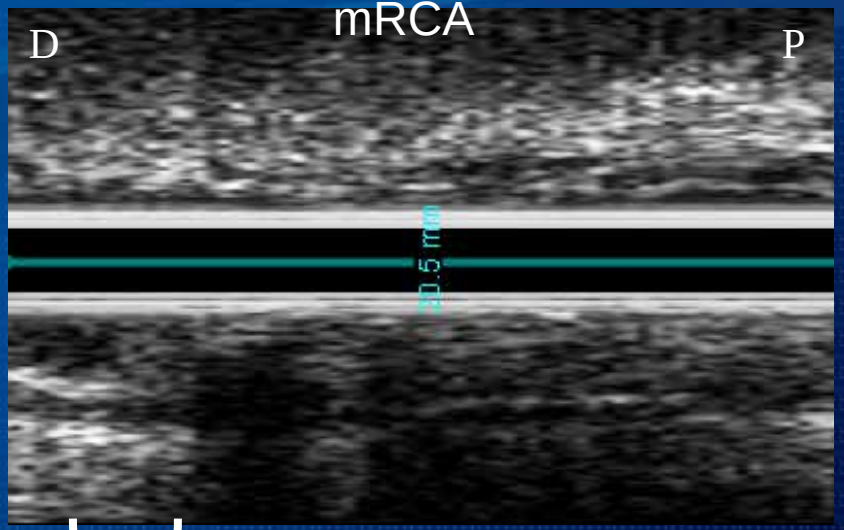
Non-culprit lesion



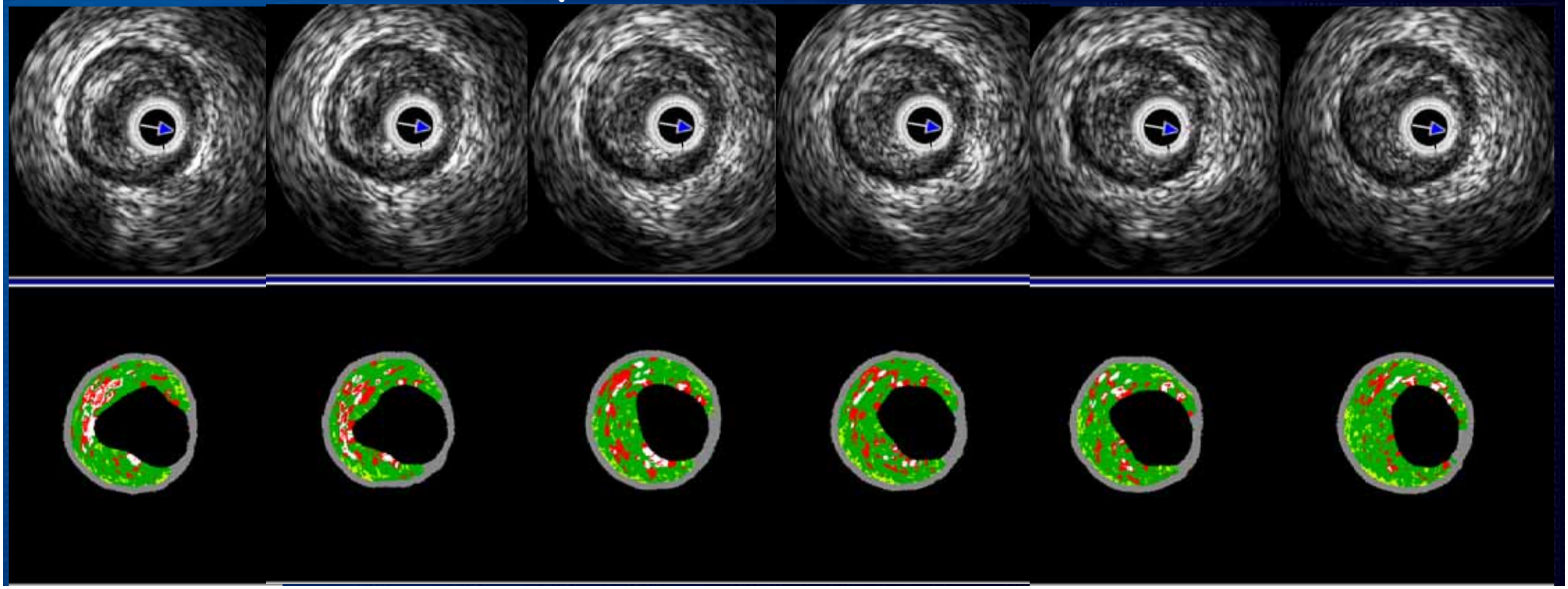
Non-attenuated plaque



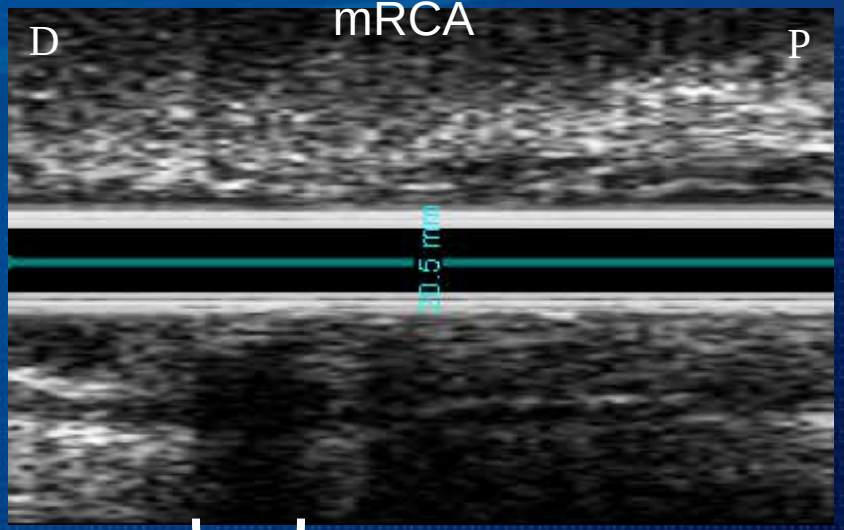
Culprit lesion with Ruptured plaque



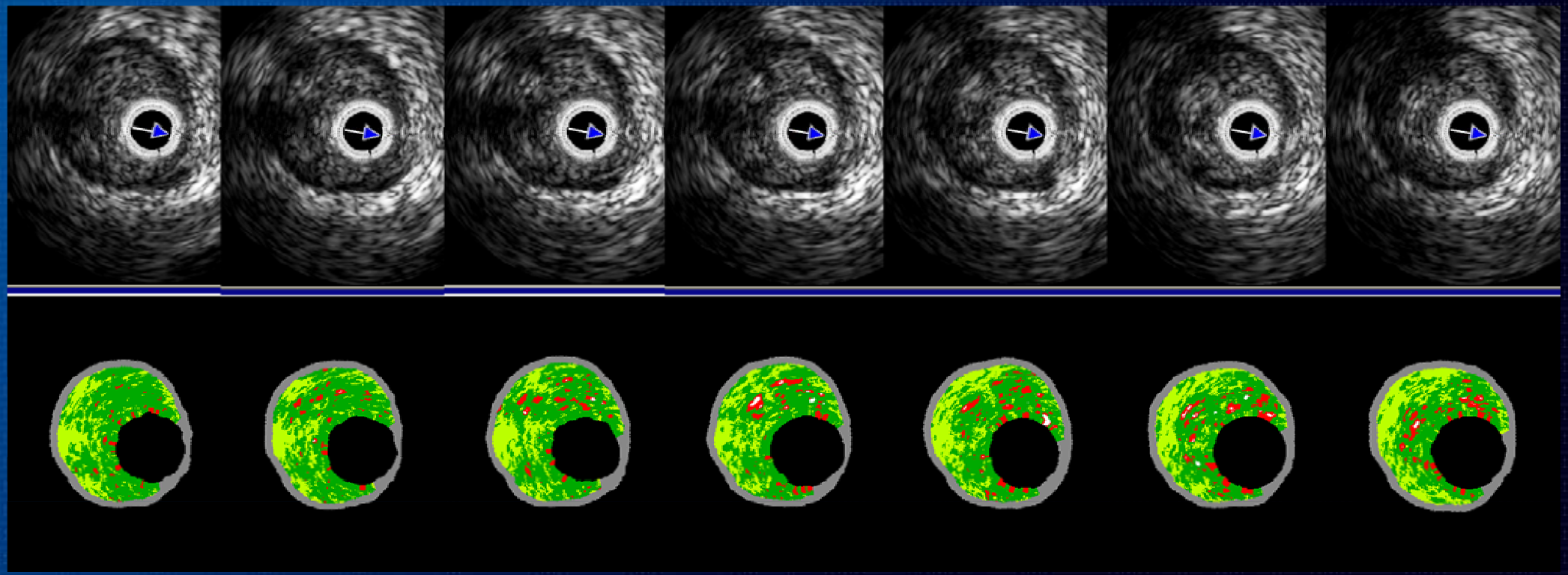
Non-attenuated plaque



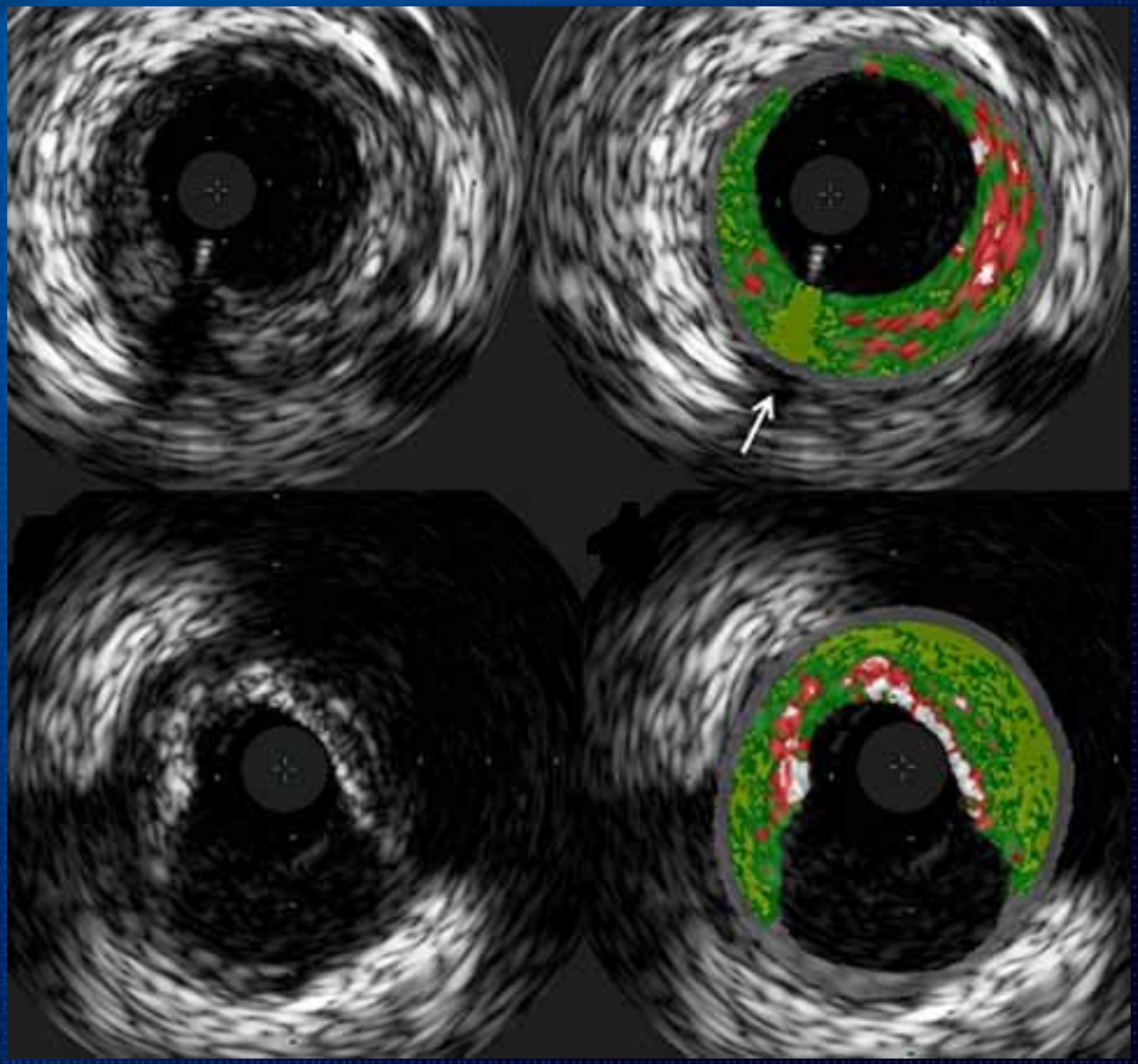
Culprit lesion with Ruptured plaque



Attenuated plaque



Signal drop-out area → FF



Culprit vs. Non-culprit

	Culprit (PR+)	Non-culprit (PR-)
Lesion length. (mm)	20.5	16.8
Remodelling index	1.15	1.18
EEM CSA (mm^2)	18.8	13.7
Lumen CSA (mm^2)	4.6	4.8
P & M CSA (mm^2)	14.2	8.9
Plaque burden (%)	75.4	64.6
FI (mm^2/%)	7.2 (68)	3.4 (59)
FF (mm^2/%)	2.0 (19)	0.6 (11)
DC (mm^2/%)	0.4 (4)	0.4 (7)
NC (mm^2/%)	0.9 (8)	1.4 (23)

Case 2

Patient Demographics

Age: 53

Gender: M

Risk factors: HTN, Dyslipidemia, Smoking

Clinical Presentation

Effort related chest pain for 2 years

Initial Laboratory Findings

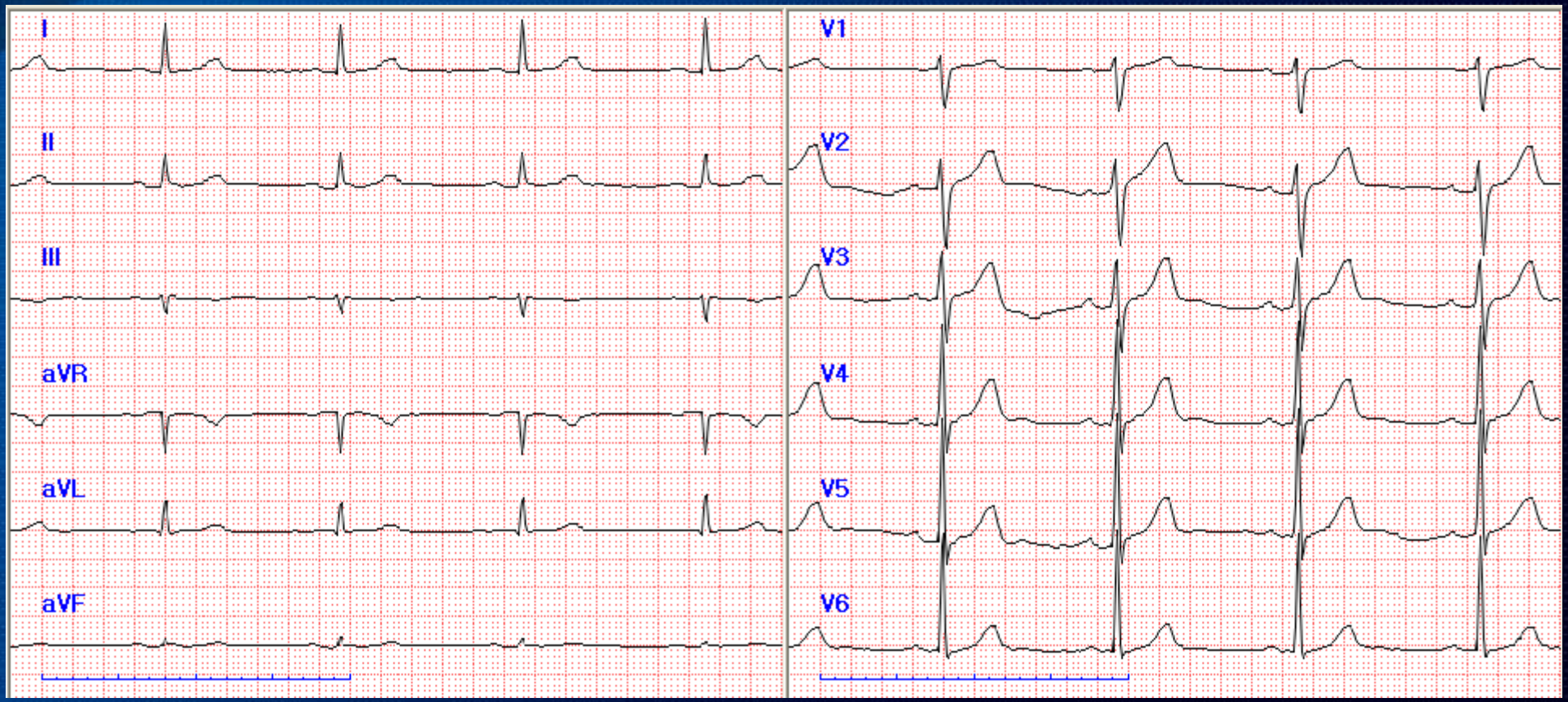
CK-MB	0.73	ng/ml
Troponin T	<0.009	ng/ml
Troponin I	0.01	ng/ml

Lipid: TC	294	mg/dl
HDL	45	mg/dl
TG	159	mg/dl
LDL	217	mg/dl

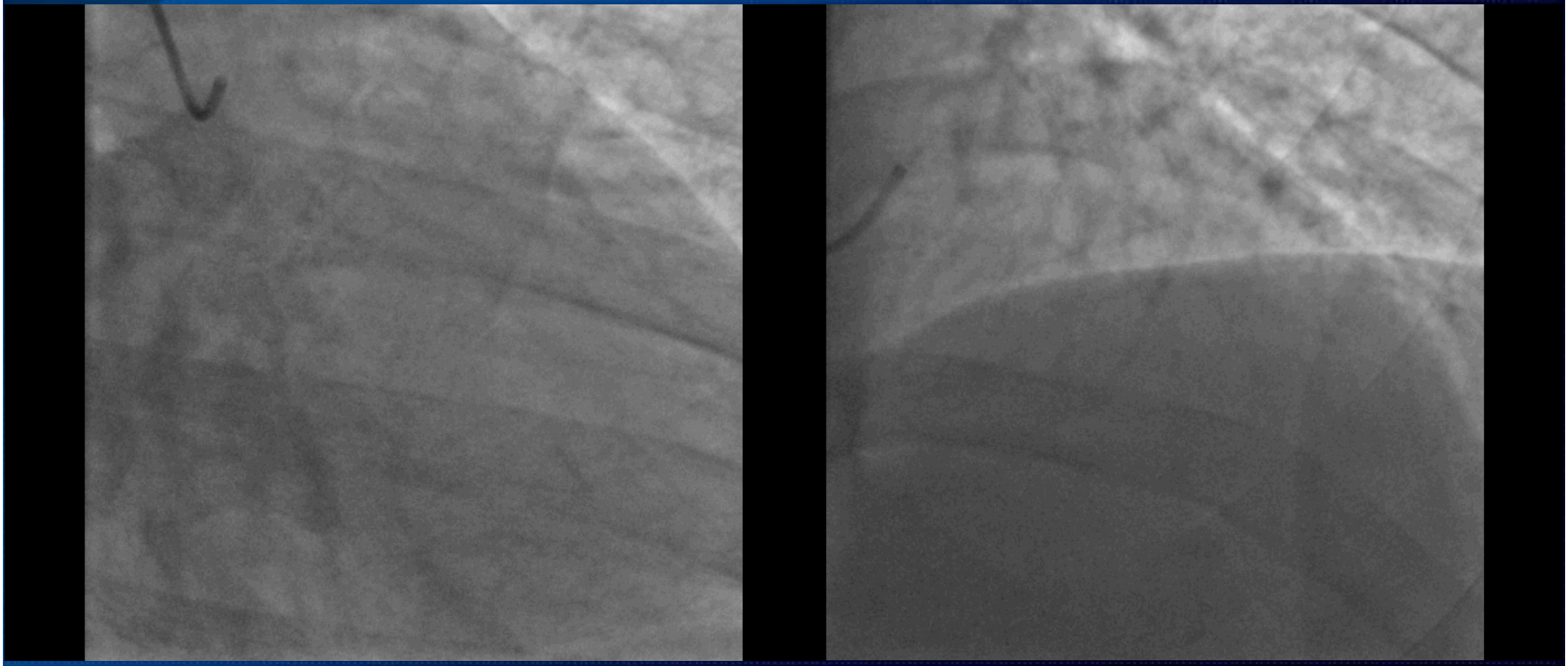
EchoCG: Normal (EF 67%)

Initial ECG

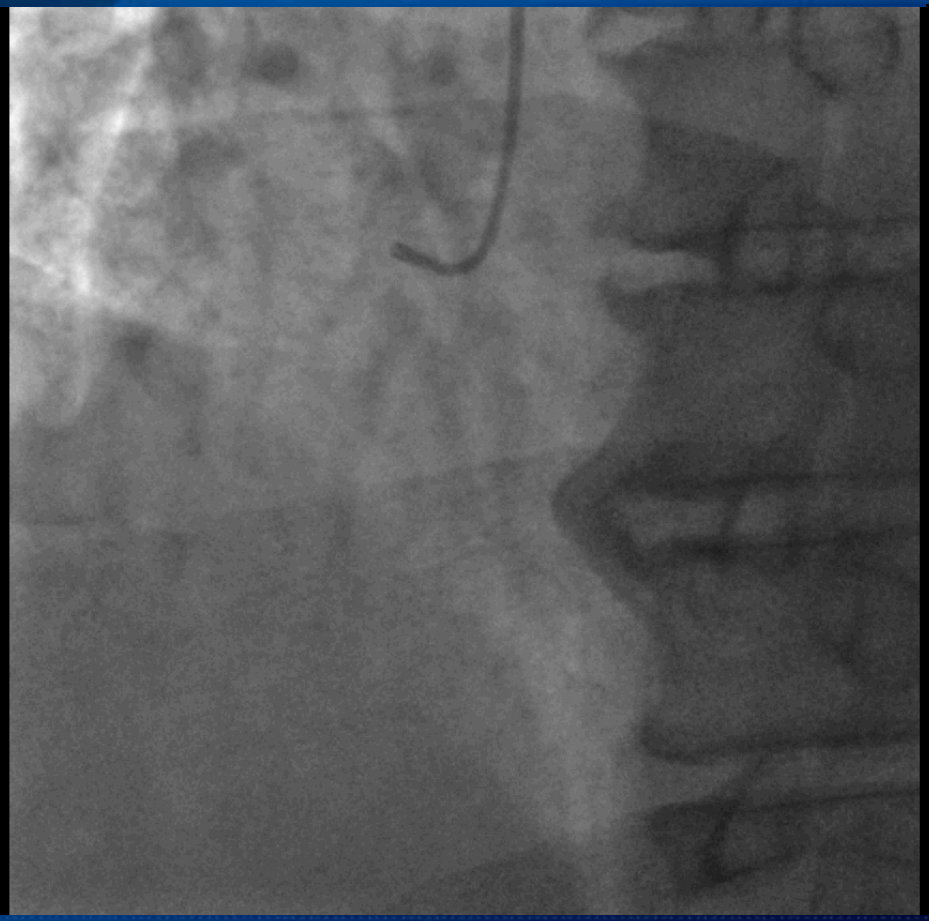
BP 150/100 mmHg



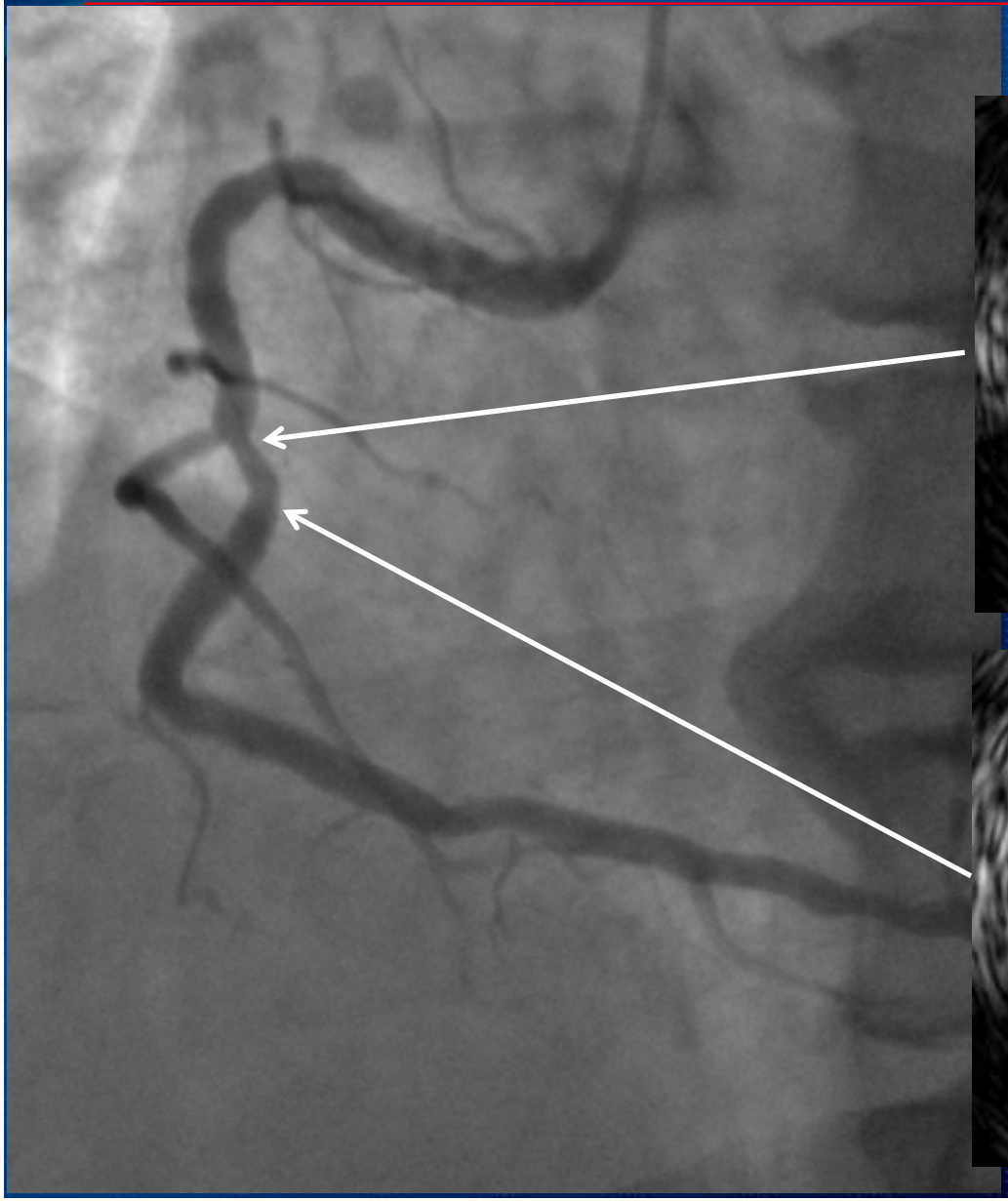
Baseline Angiogram (LCA)

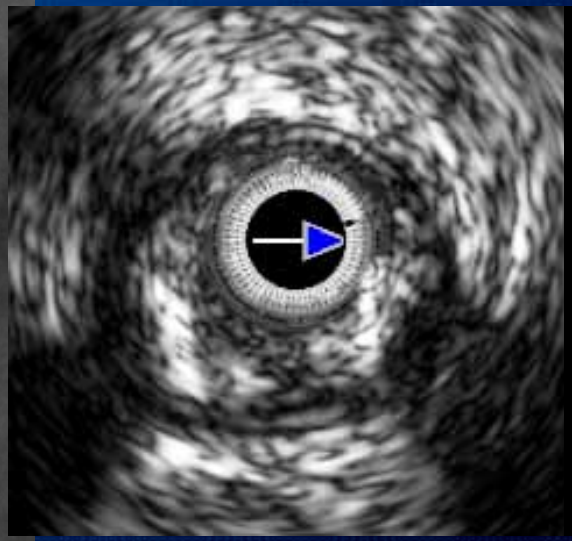


Baseline Angiogram (RCA)

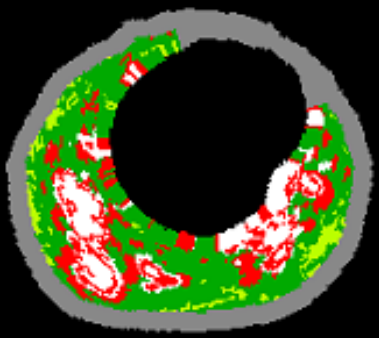


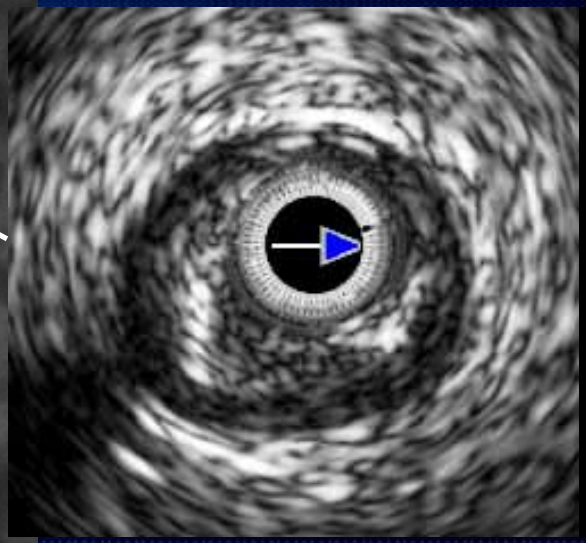
Baseline VH-IVUS



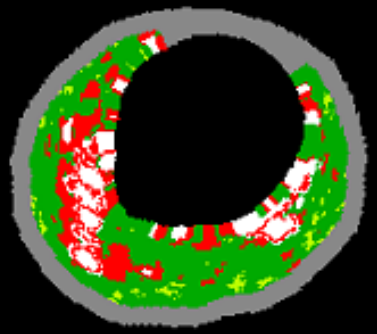


EEM = 14.8 mm²
PB = 69%
NC = 1.6 mm² (23%)

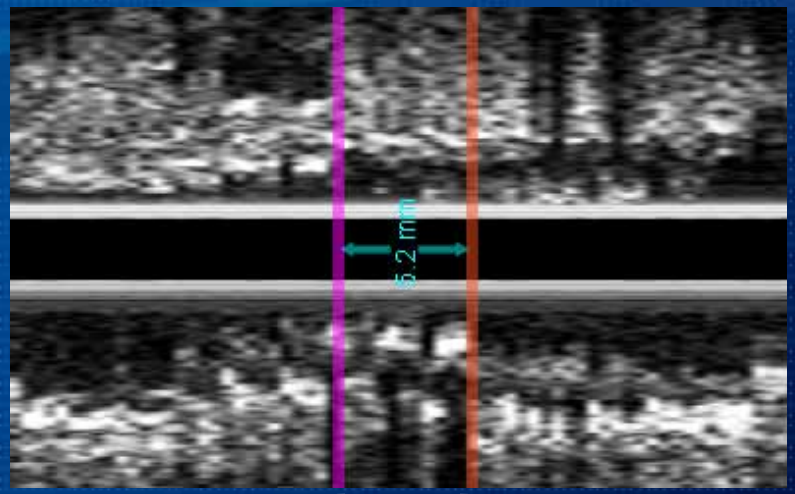




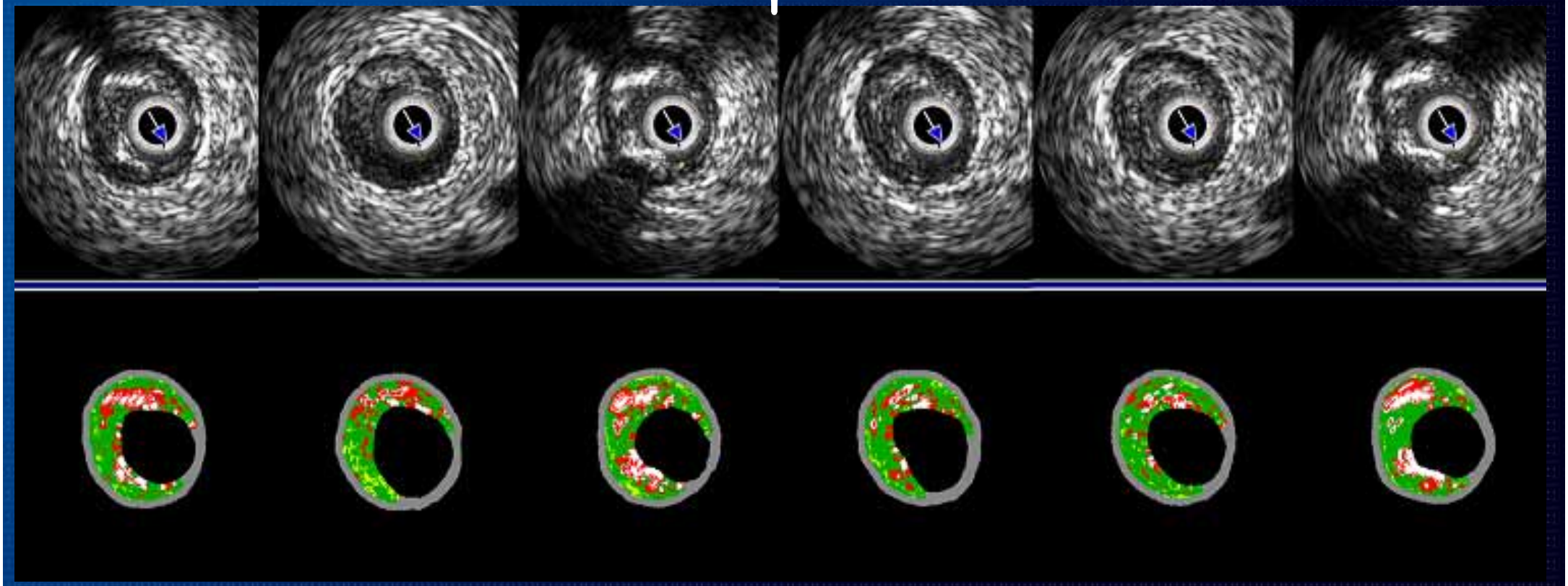
EEM = 14.9 mm²
PB = 67%
NC = 1.5 mm² (23%)



Target lesion



Non-attenuated plaque



Culprit vs. Non-culprit vs. Target

	STEMI		SA
	Culprit	Non-culprit	Target
Lesion length.	20.5	16.8	5.2
Remodelling index	1.15	1.18	0.93
EEM CSA (mm^2)	18.8	13.7	15.9
Lumen CSA (mm^2)	4.6	4.8	6.6
P & M CSA (mm^2)	14.2	8.9	9.3
Plaque burden (%)	75.4	64.6	58
FI (mm^2/%)	7.2 (68)	3.4 (59)	3.5 (60)
FF (mm^2/%)	2.0 (19)	0.6 (11)	0.5 (8)
DC (mm^2/%)	0.4 (4)	0.4 (7)	0.8 (14)
NC (mm^2/%)	0.9 (8)	1.4 (23)	1.1 (18)

Summary

Case 1:

- 53/F, STEMI
- Both culprit and non-culprit lesion showed positive remodelling.
- NC of Culprit lesion with ruptured plaque was smaller than that of non-culprit lesion.
- Attenuated plaque was most likely to be fibrofatty in VH that NC could be underestimated.

Case 2:

- 53/M, SA
- Target lesion showed negative remodelling.
- In comparison with CASE 1, PB & FF were small and DC & NC were large relatively.
- Non-calcific attenuated plaque was not observed.

Thank you for your attention !