22nd CARDIOVASCULAR SUMMIT
TCTAP 2017
April 25-27, 2017
Coex, Seoul, Korea

Learning from the Cases:

When I Need Imaging
I Reach for OCT Because…

Keimyung University Dongsan Medical Center

Cardiovascular Interventions & Imaging

Yoon Hyuck-Jun

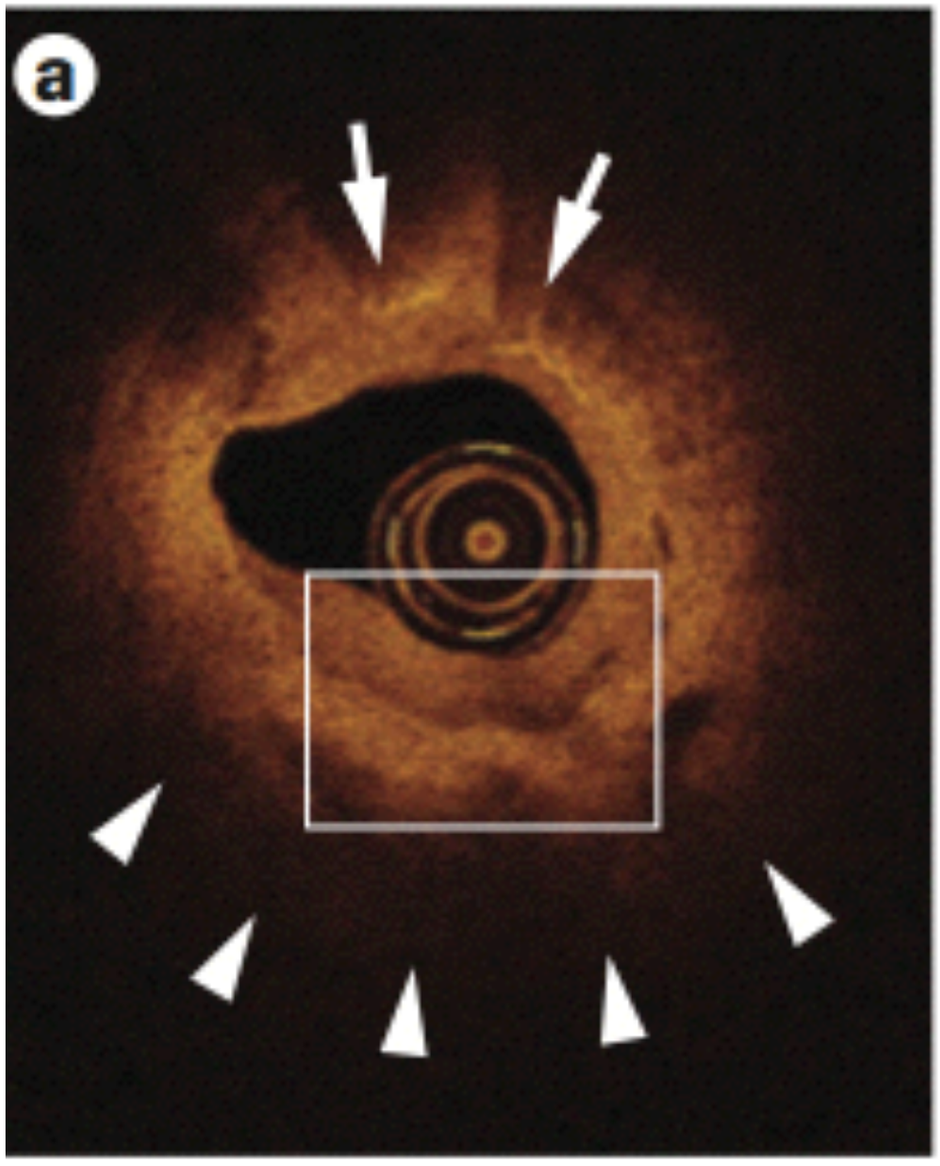
4 Reasons Why I Choose OCT…

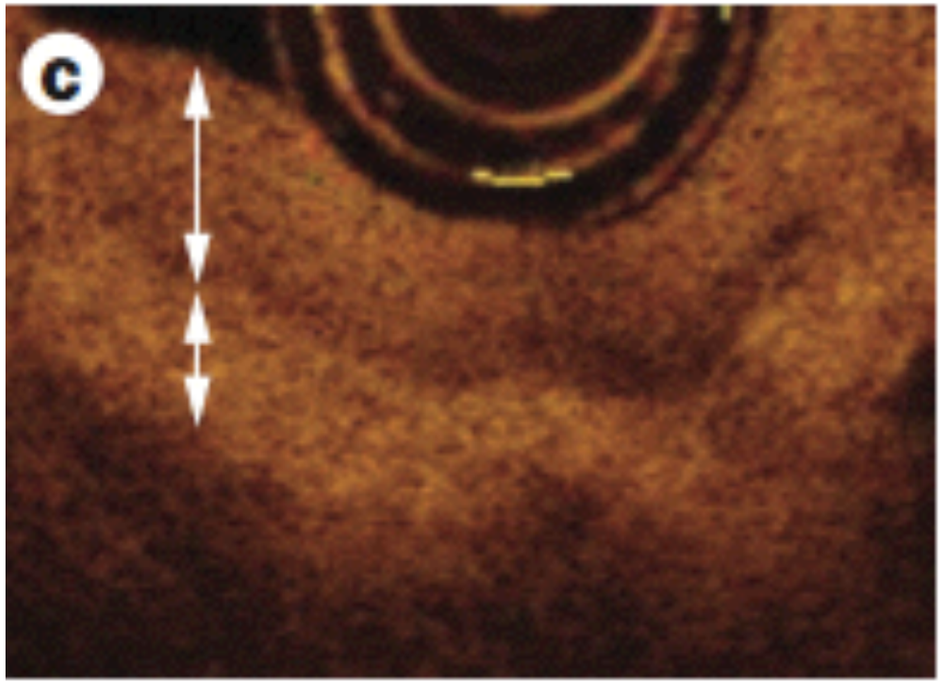
	ESC	AHA/ACC
OCT	**Class IIa (level of evidence: C)** OCT to assess mechanisms of stent failure **Class IIb (level of evidence: C)** OCT in selected patients to optimise stent implantation	The appropriate role for optical coherence tomography in routine clinical-decision making has not been established

OCT may be used to provide additional and complementary information to coronary angiography.

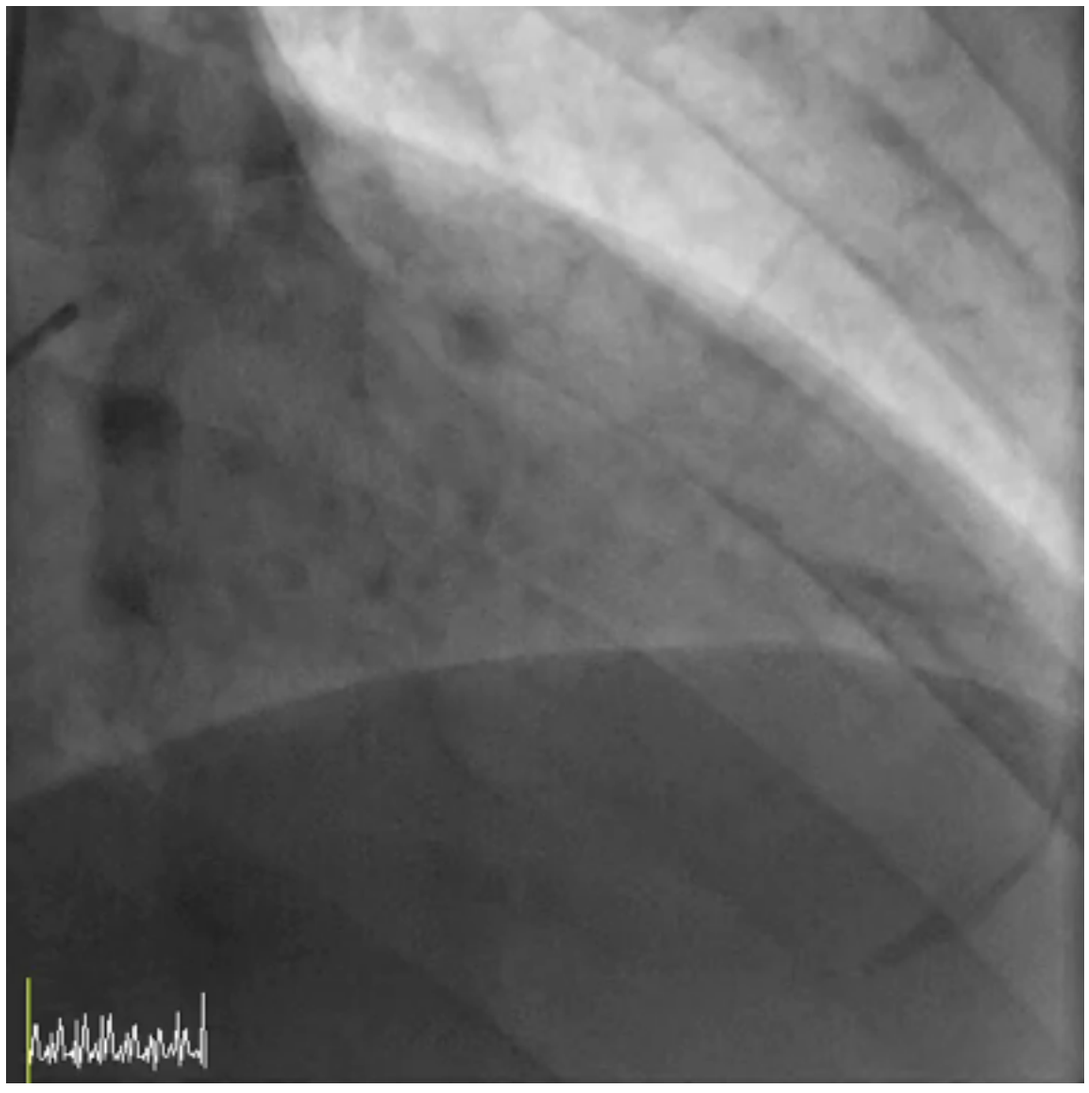
When I need OCT imaging

For ambiguous lesion

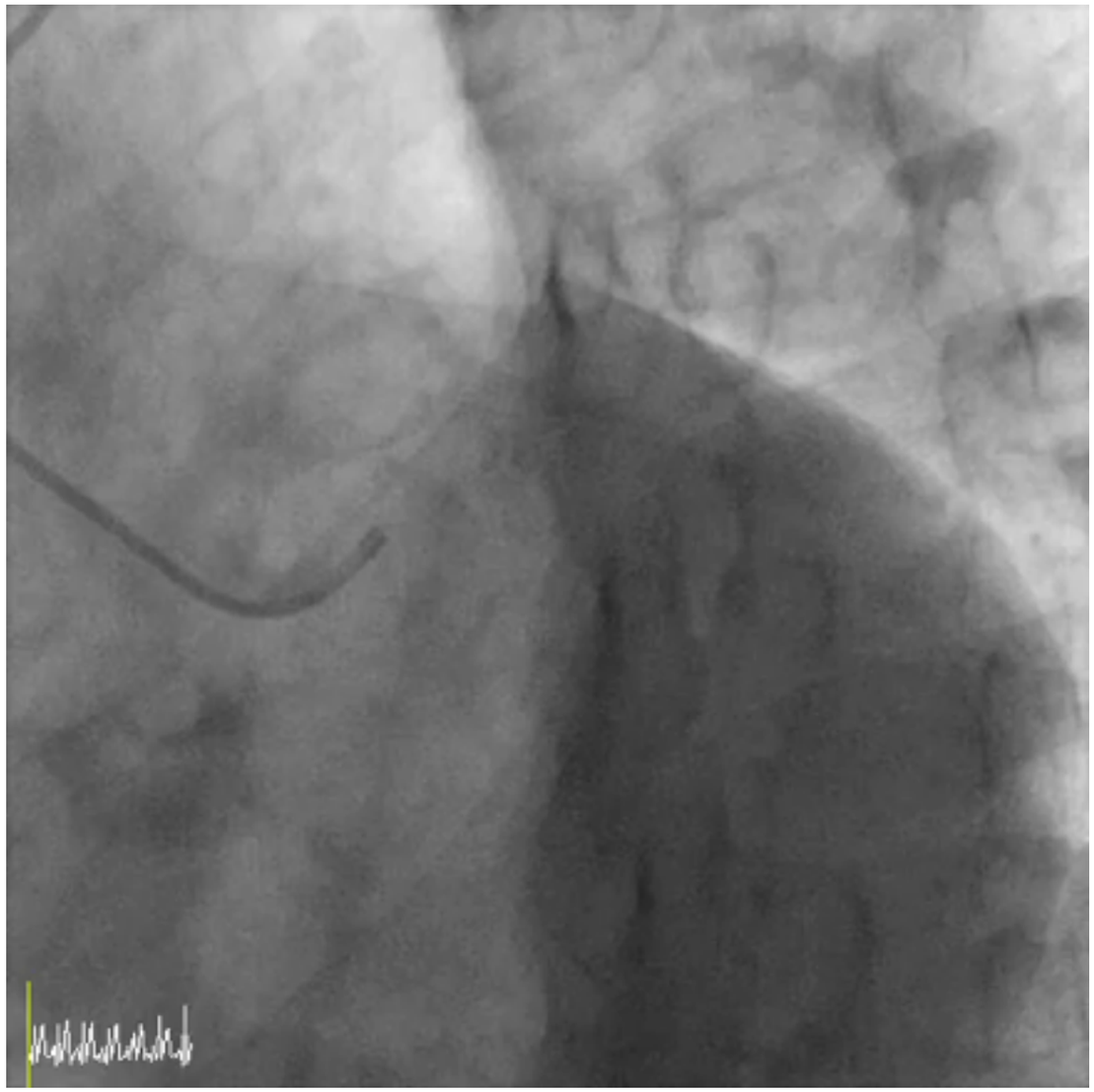


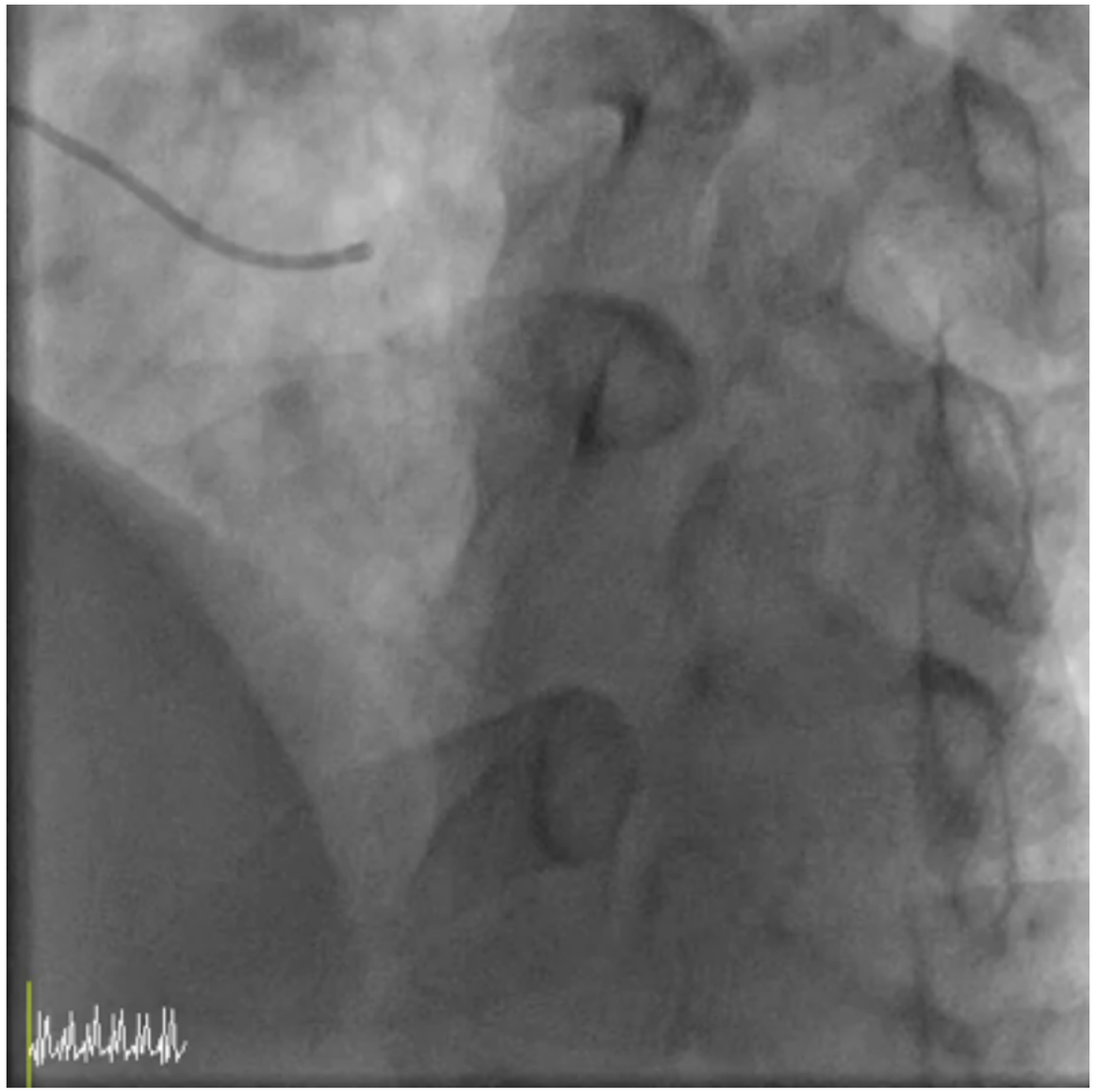


Case 1 // 48 YO male, Stable Angina

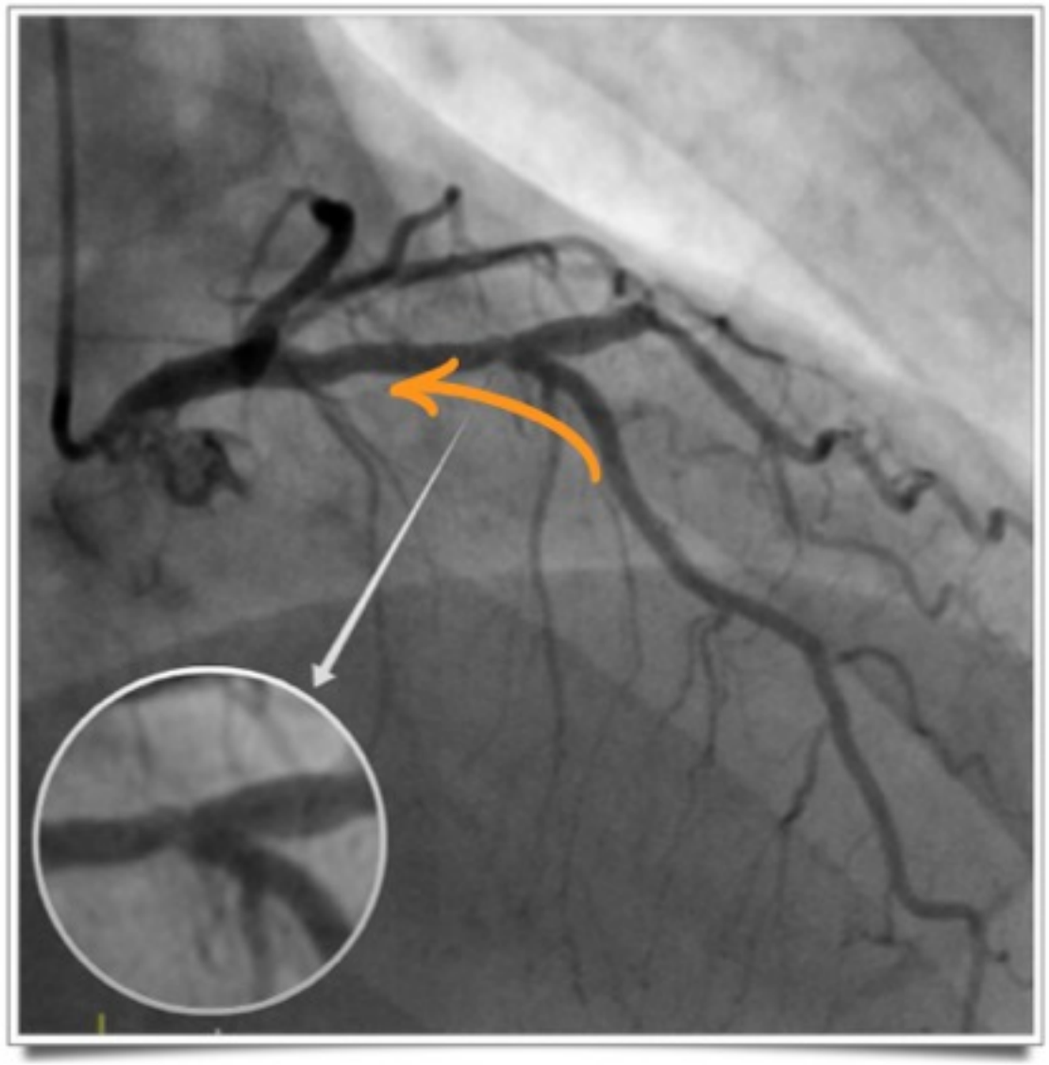


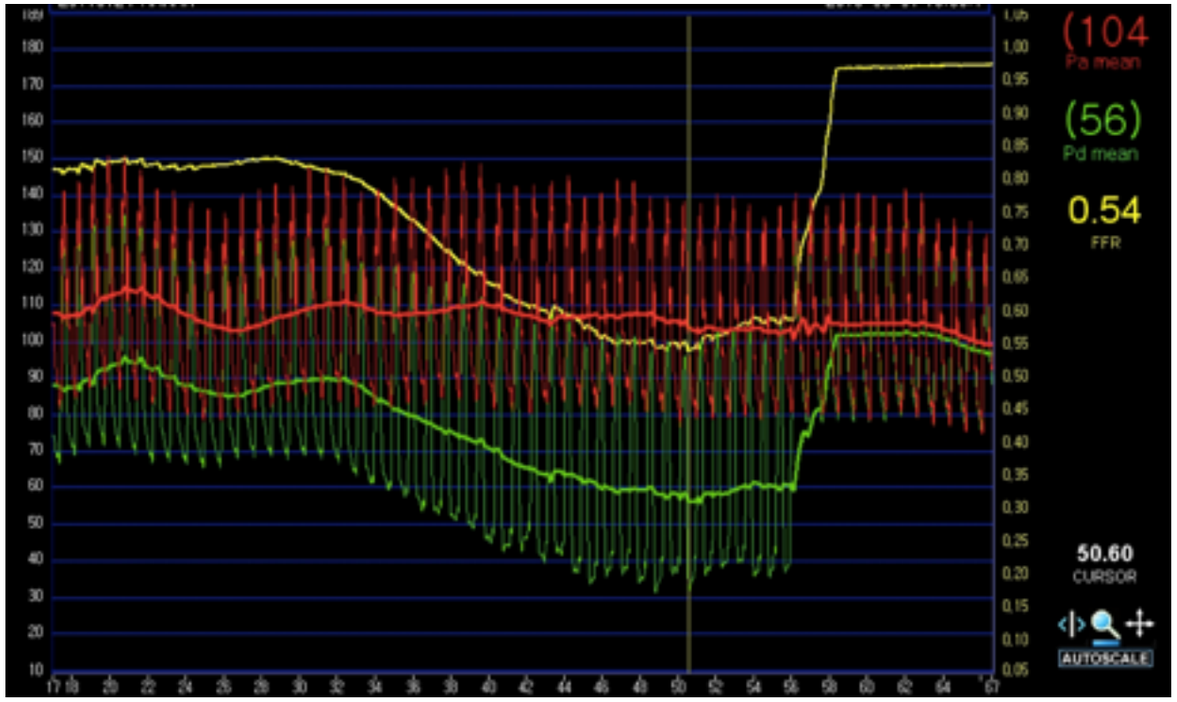
Case 1 // 48 YO male, Stable Angina



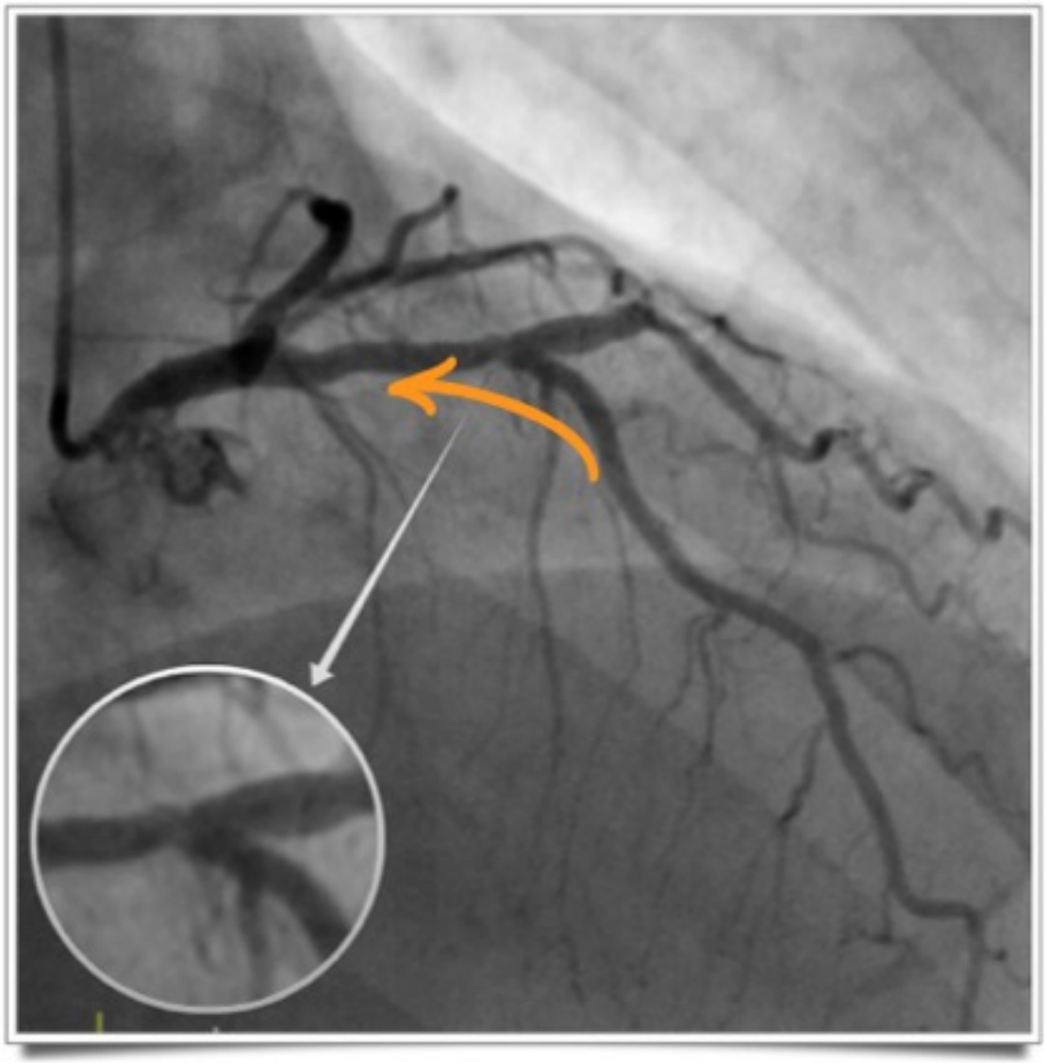


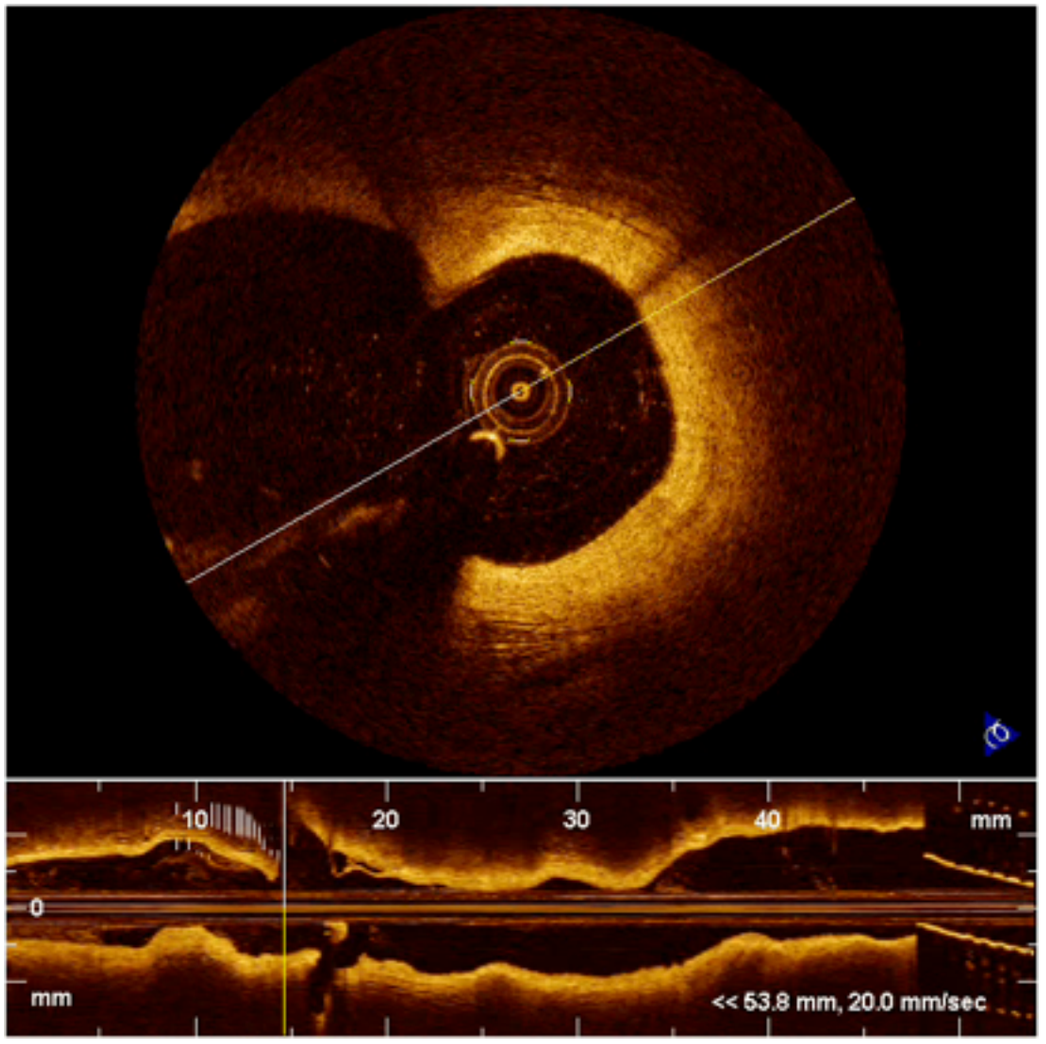
Case 1 // 48 YO male, Stable Angina





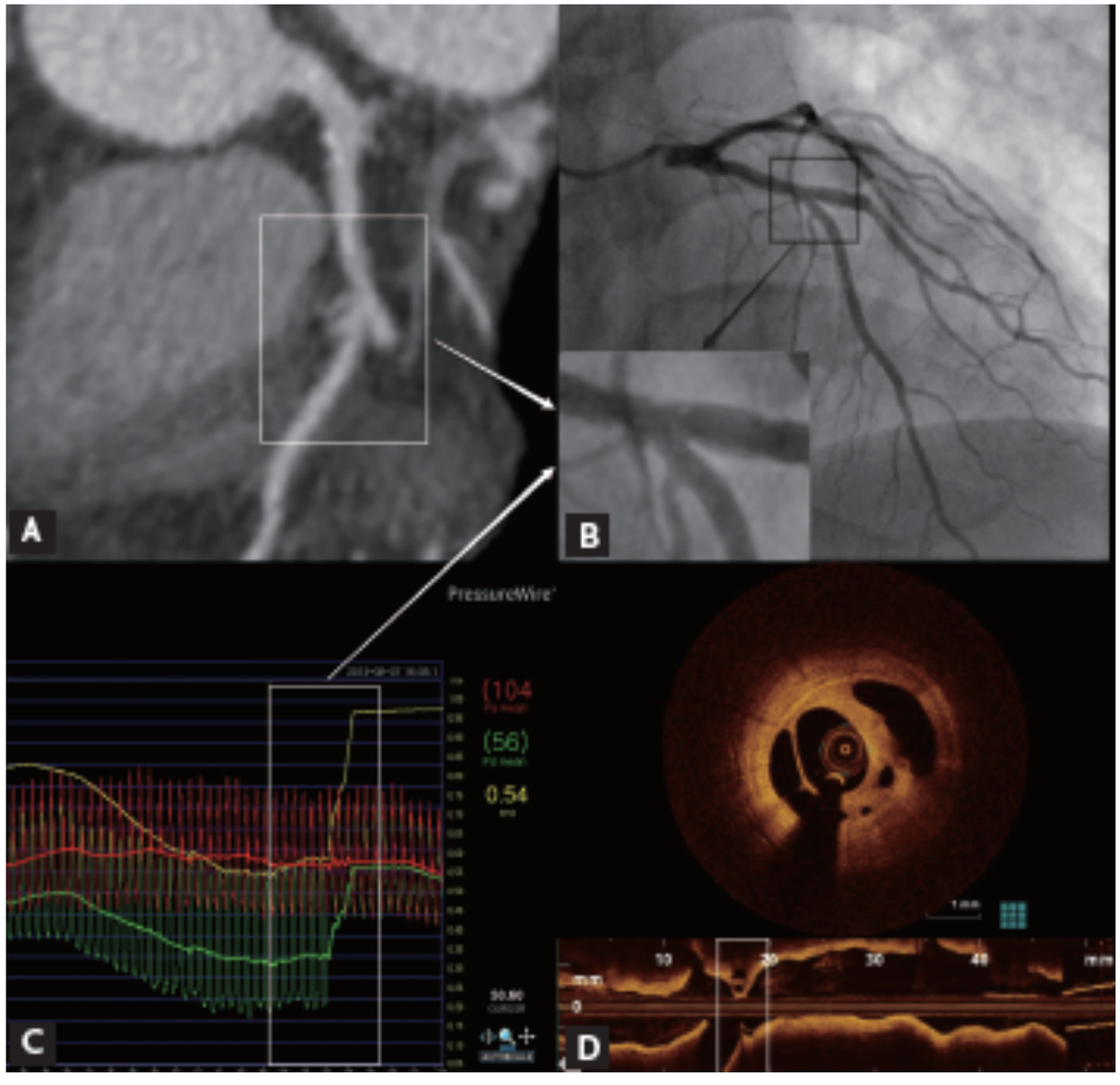
Case 1 // 48 YO male, Stable Angina





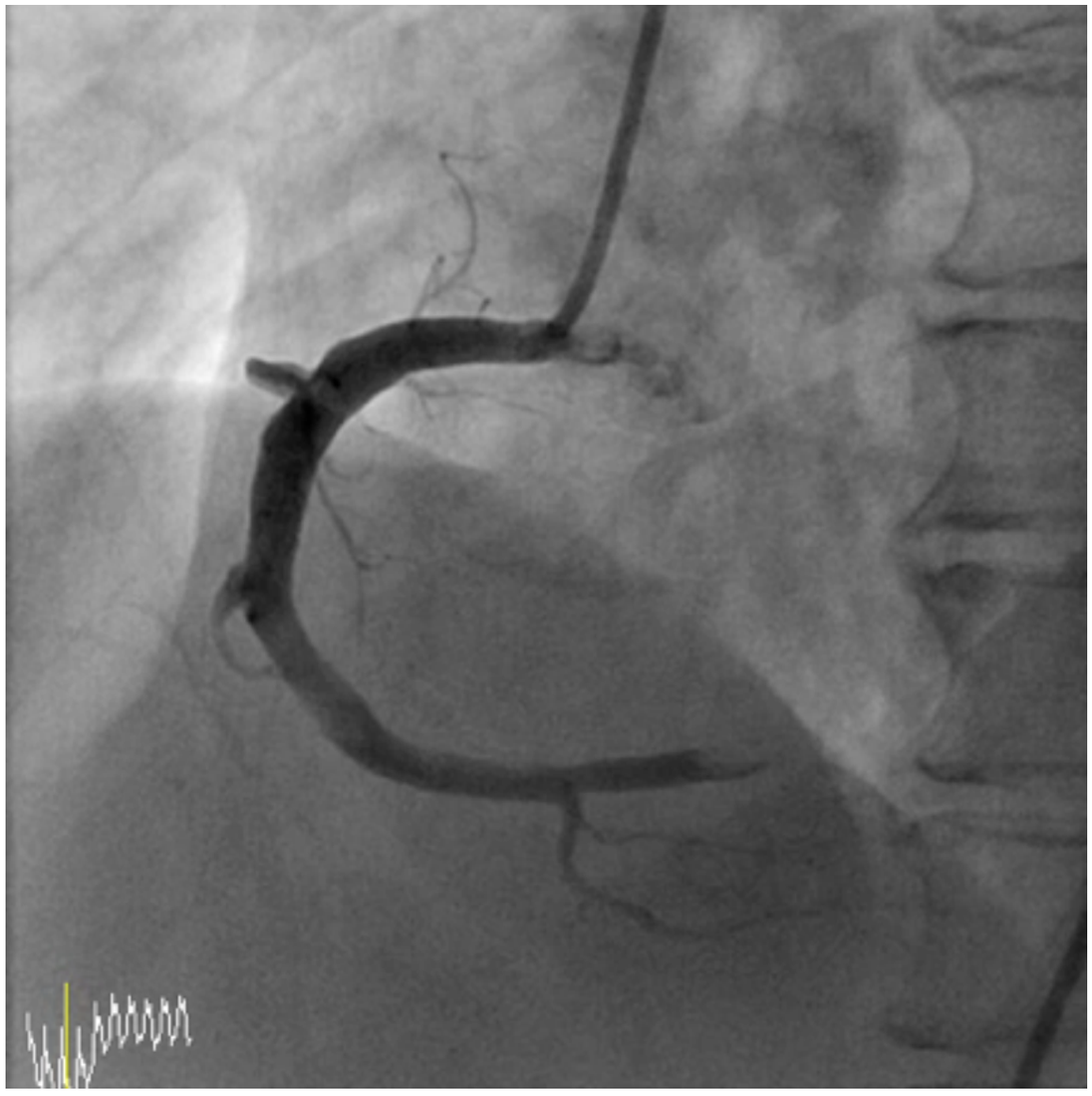
Angiographically minimal but functionally significant coronary lesion confirmed by optical coherence tomography

Hyuck-Jun Yoon, Yun-Kyeong Cho, Chang-Wook Nam, Kwon-Bae Kim, and Seung-Ho Hur



KJIM (2016);31:807-808

Case 2 // 65 YO female, STEMI (inf)



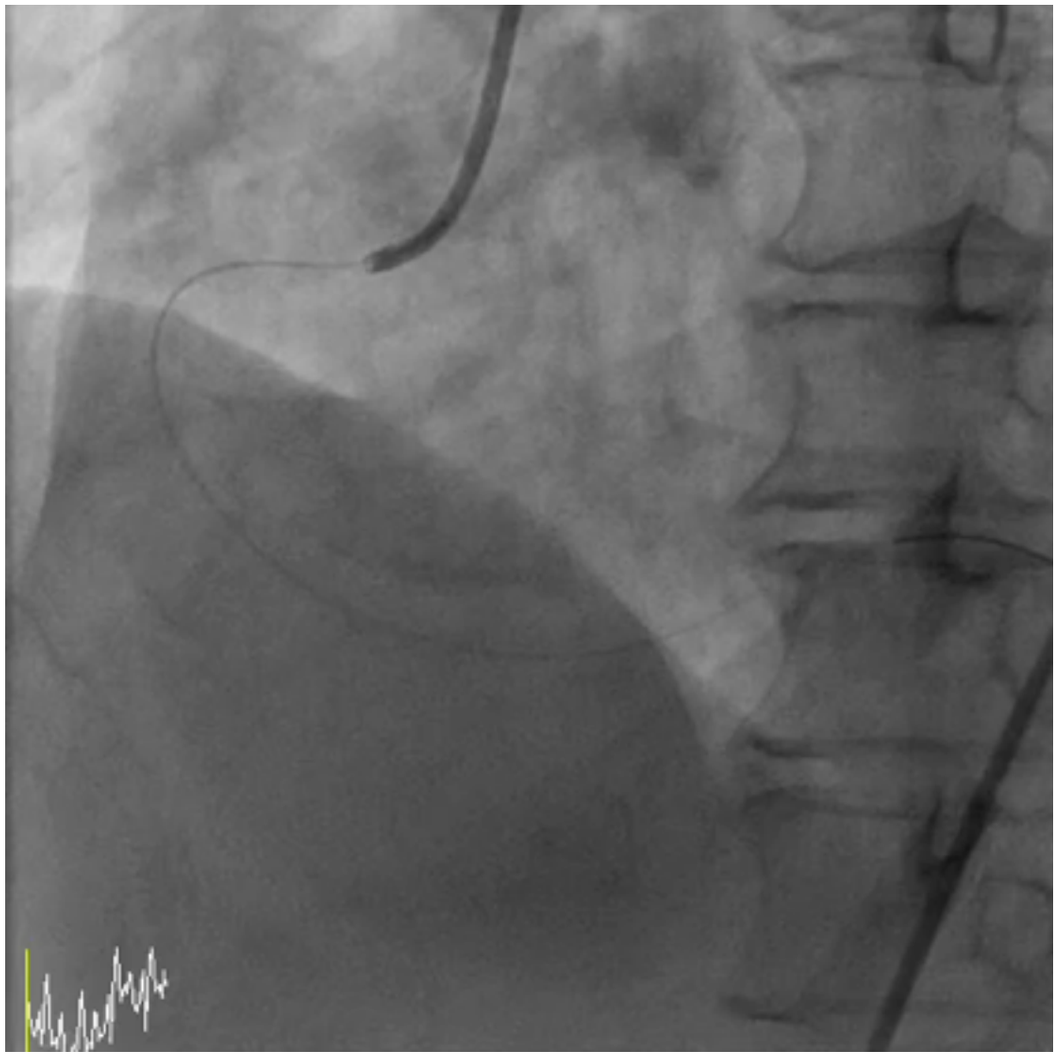
Resting onset chest pain for 3hrs

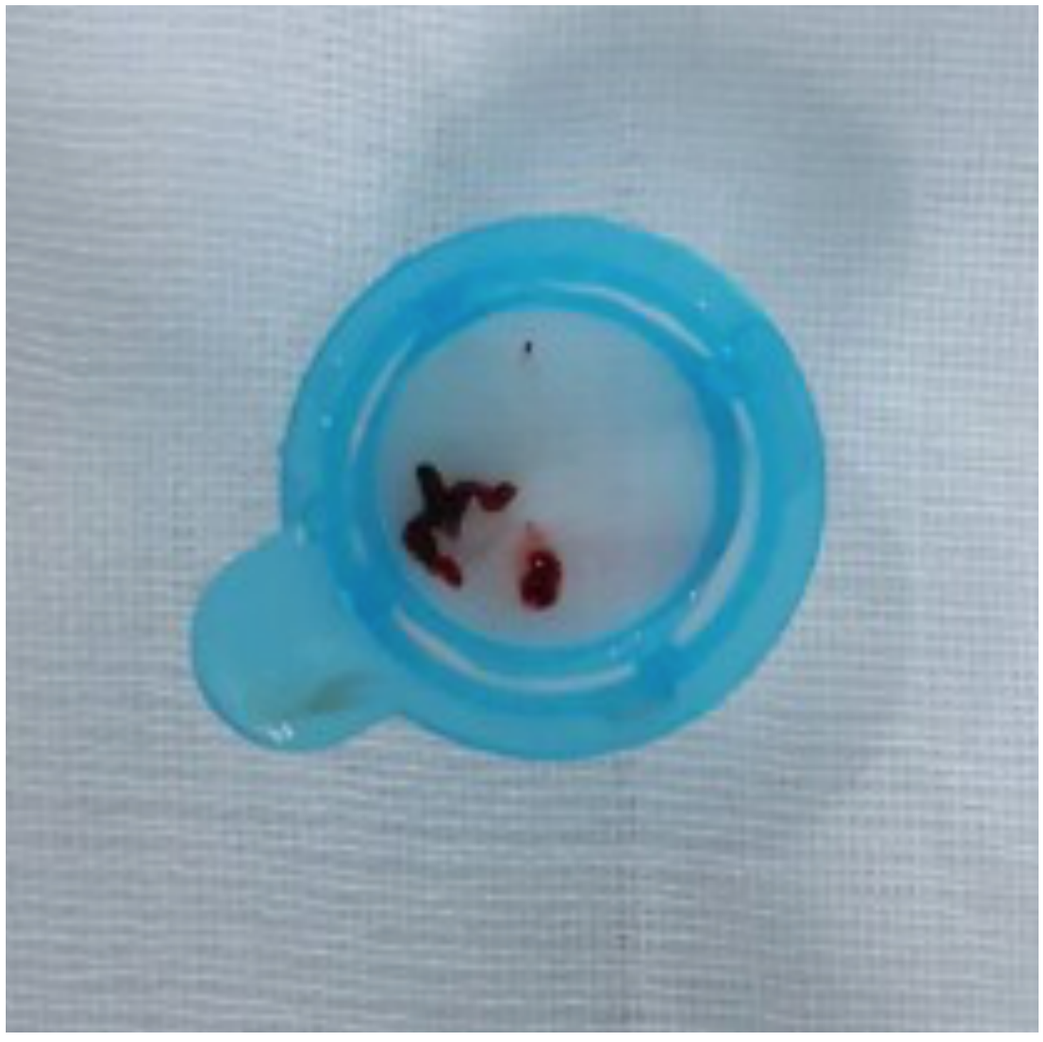
ECG – II III aVF ST elevation

Where is the culprit lesion?

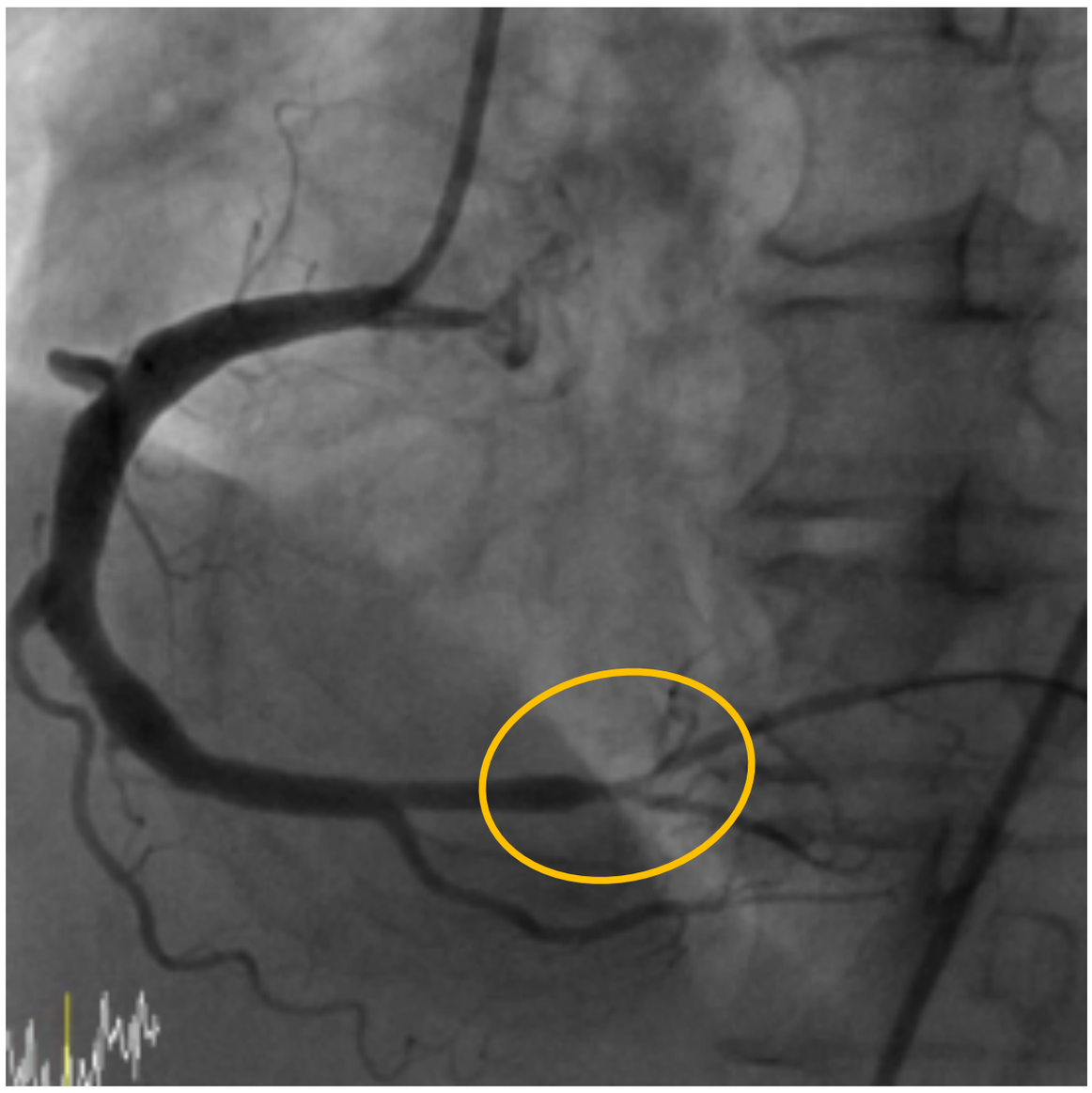
How to treat this lesion?

Case 2 // 65 YO female, STEMI (inf)





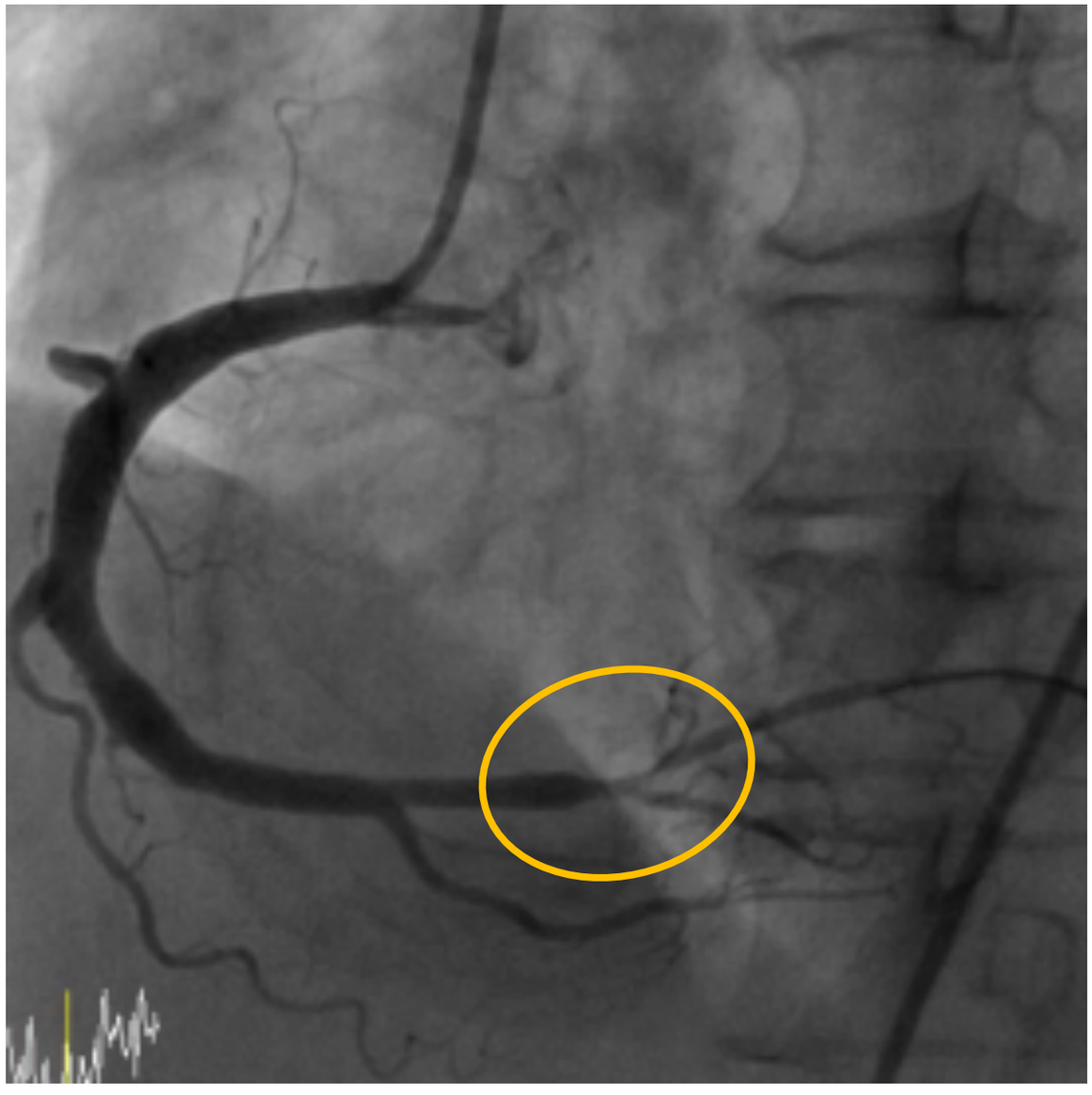
Case 2 // 65 YO female, STEMI (inf)

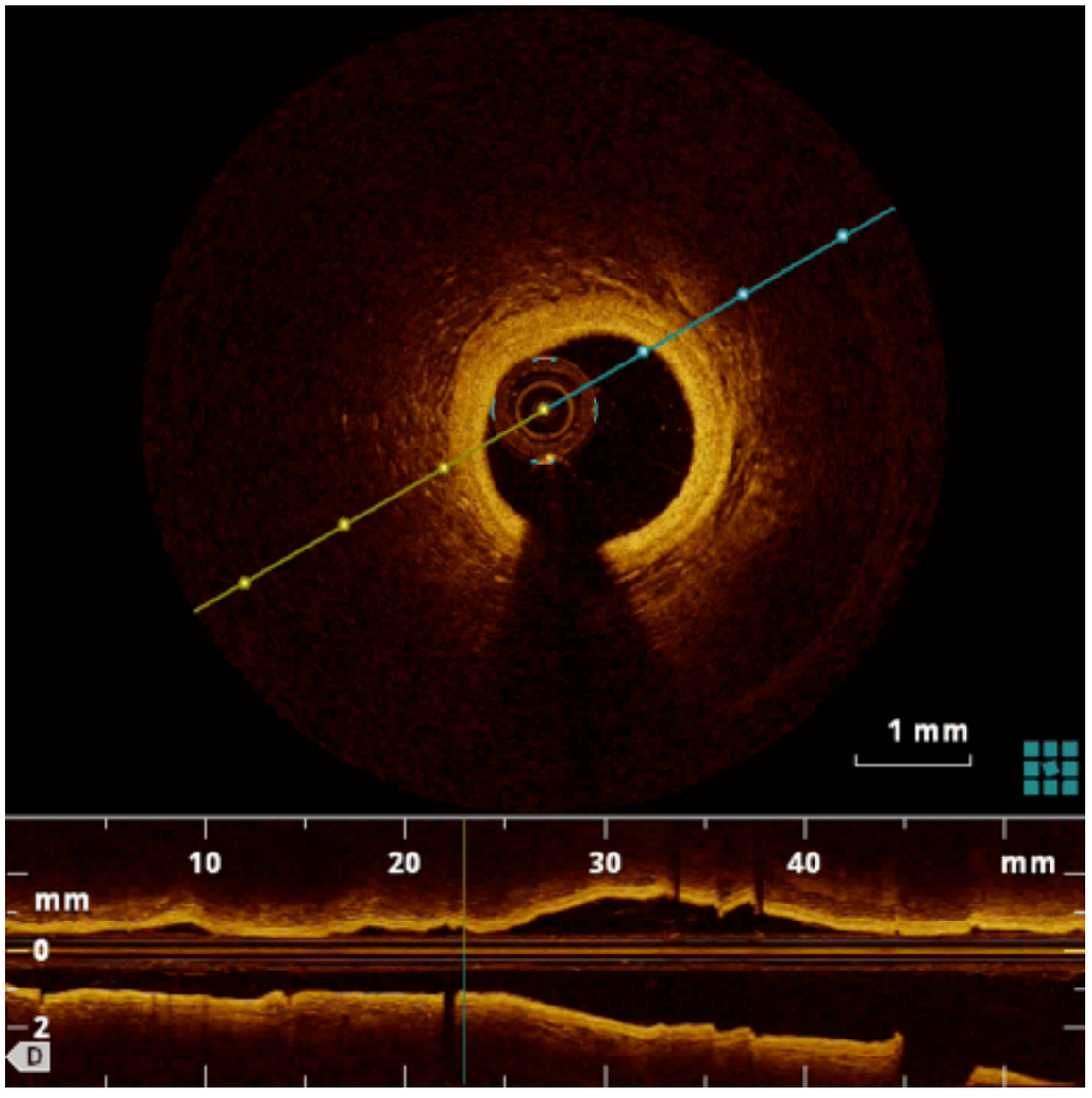


Stent or not?

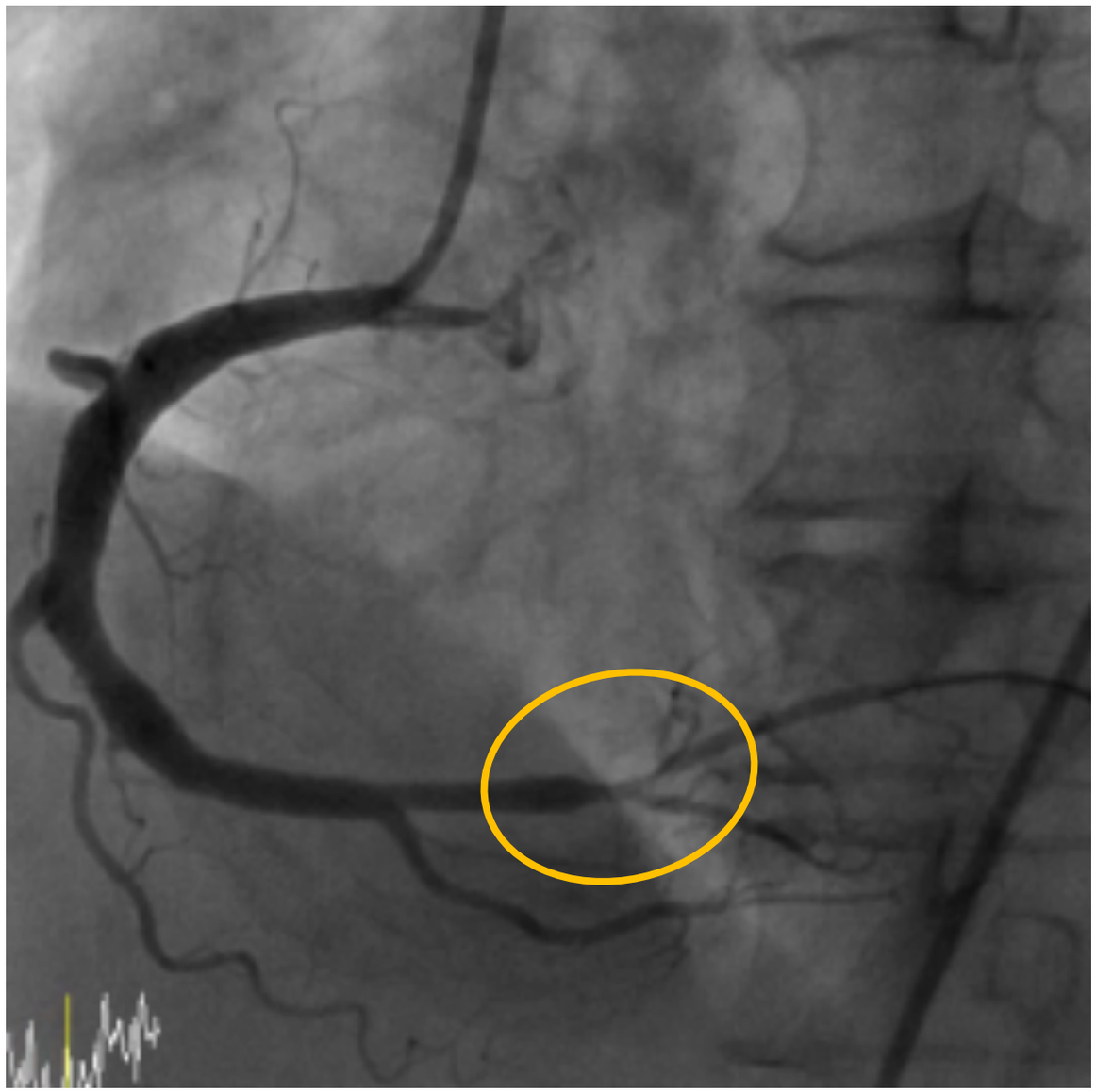
If Stent, how to determine stent size?

Case 2 // 65 YO female, STEMI (inf)



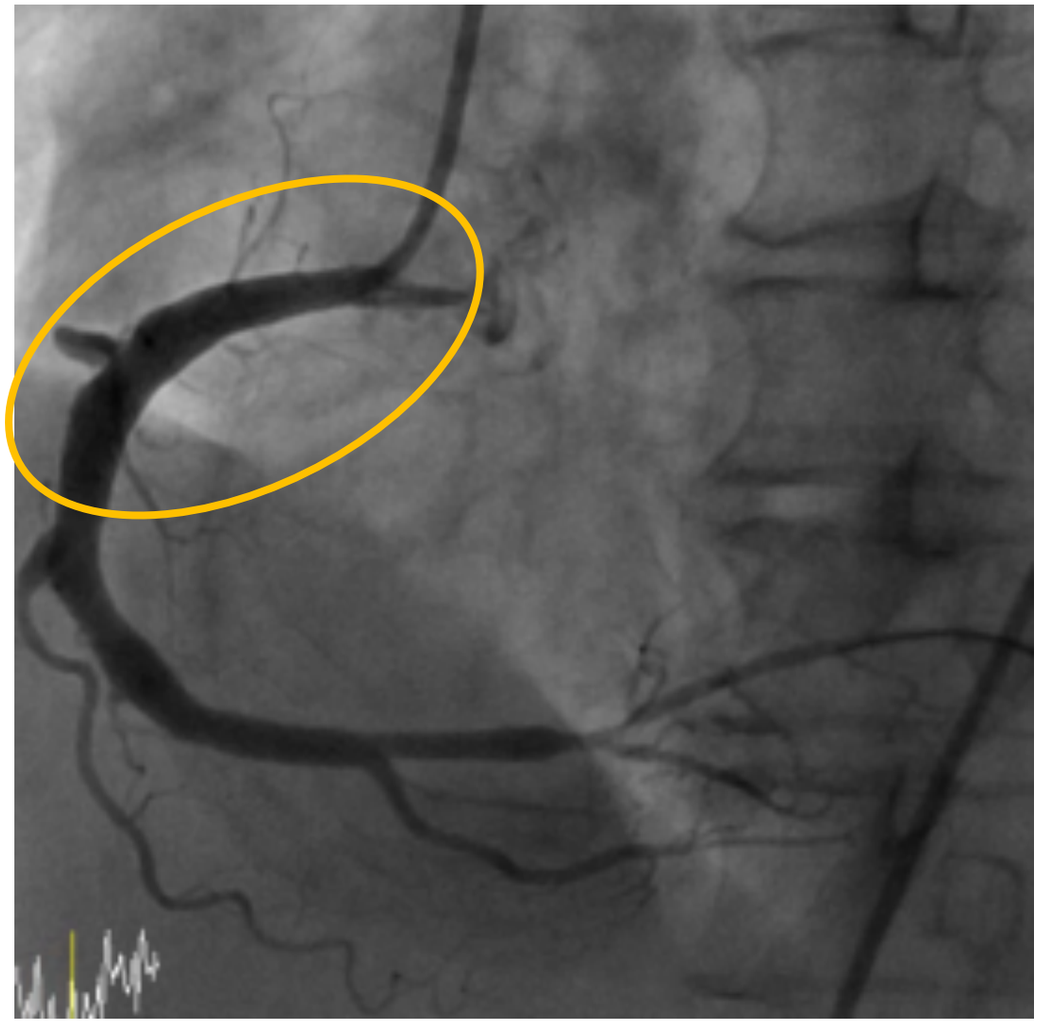


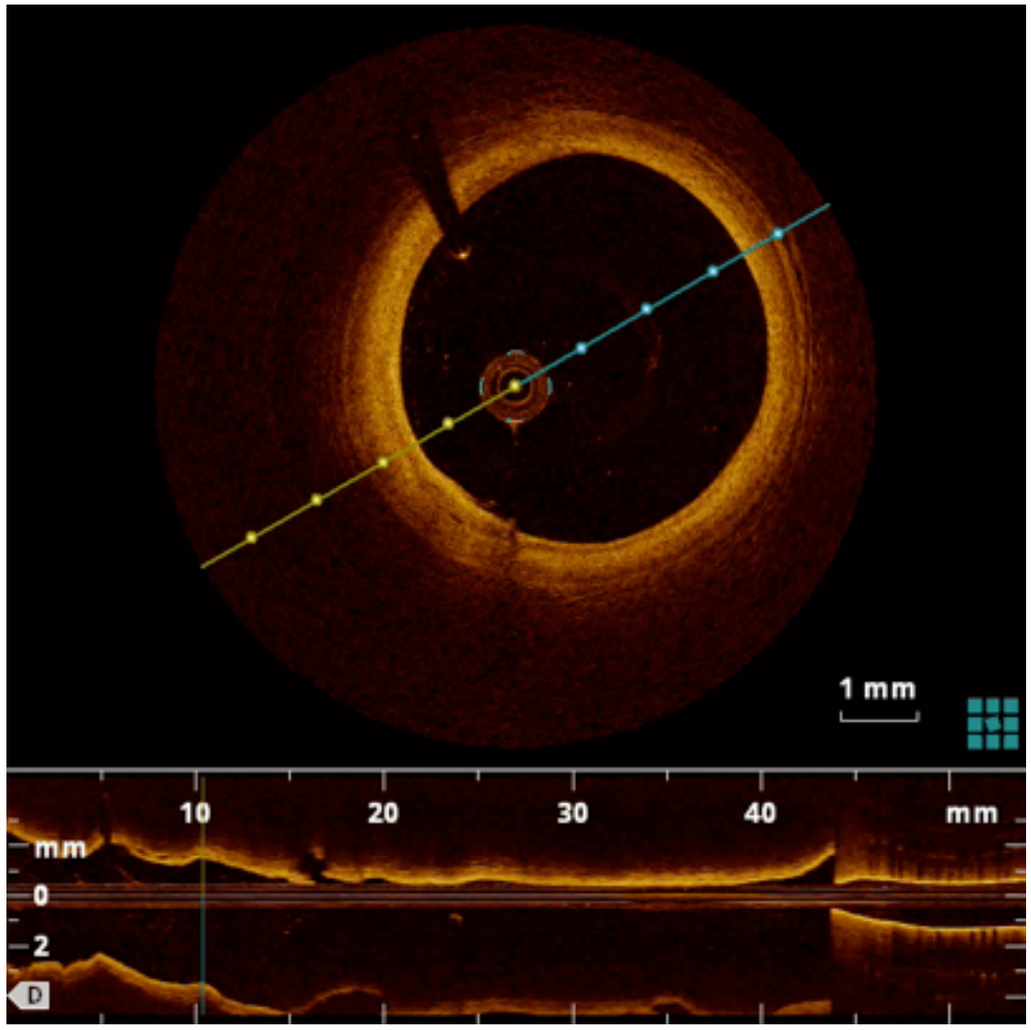
Case 2 // 65 YO female, STEMI (inf)



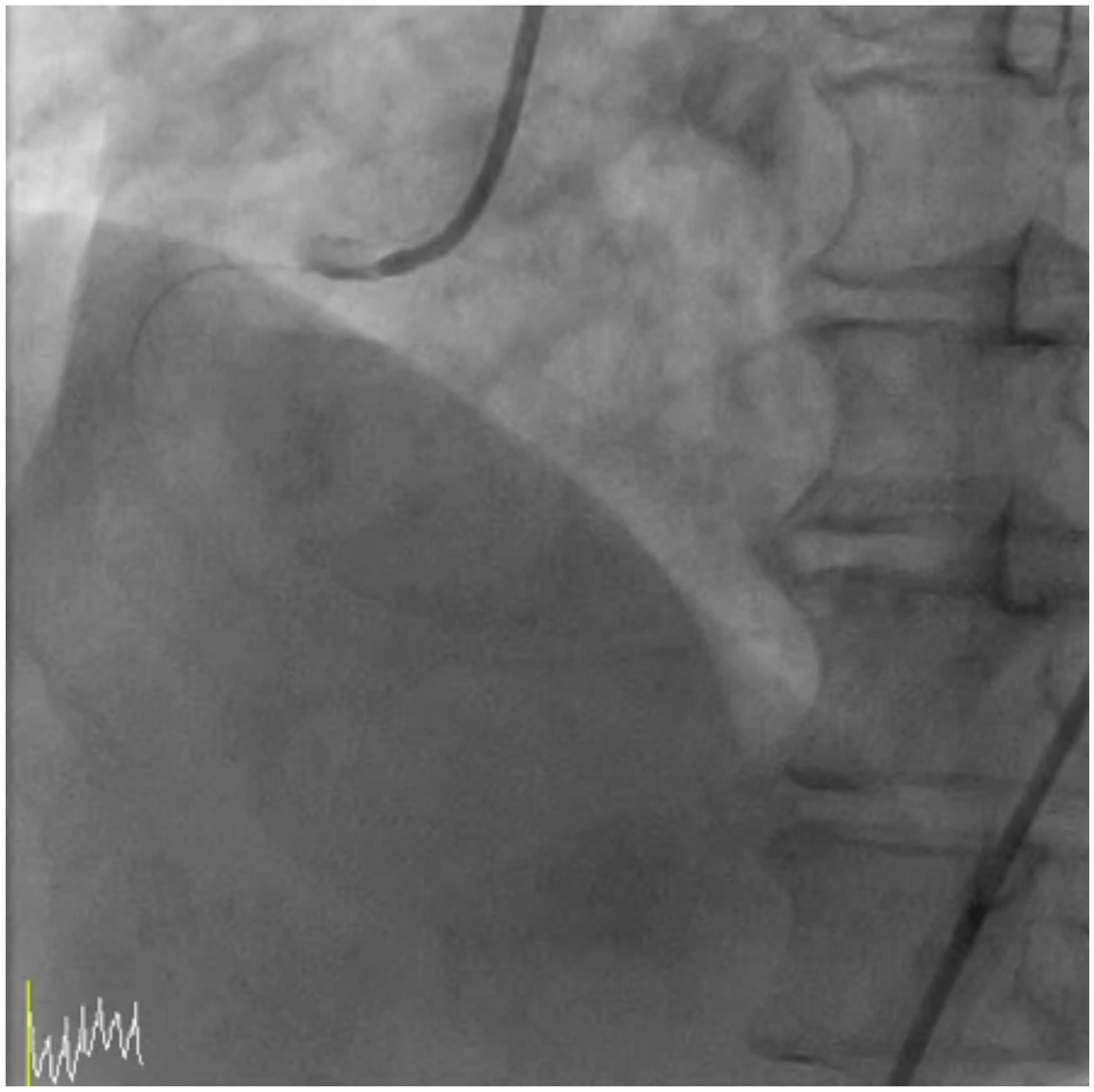
Where did thrombus came from ??

Case 2 // 65 YO female, STEMI (inf)





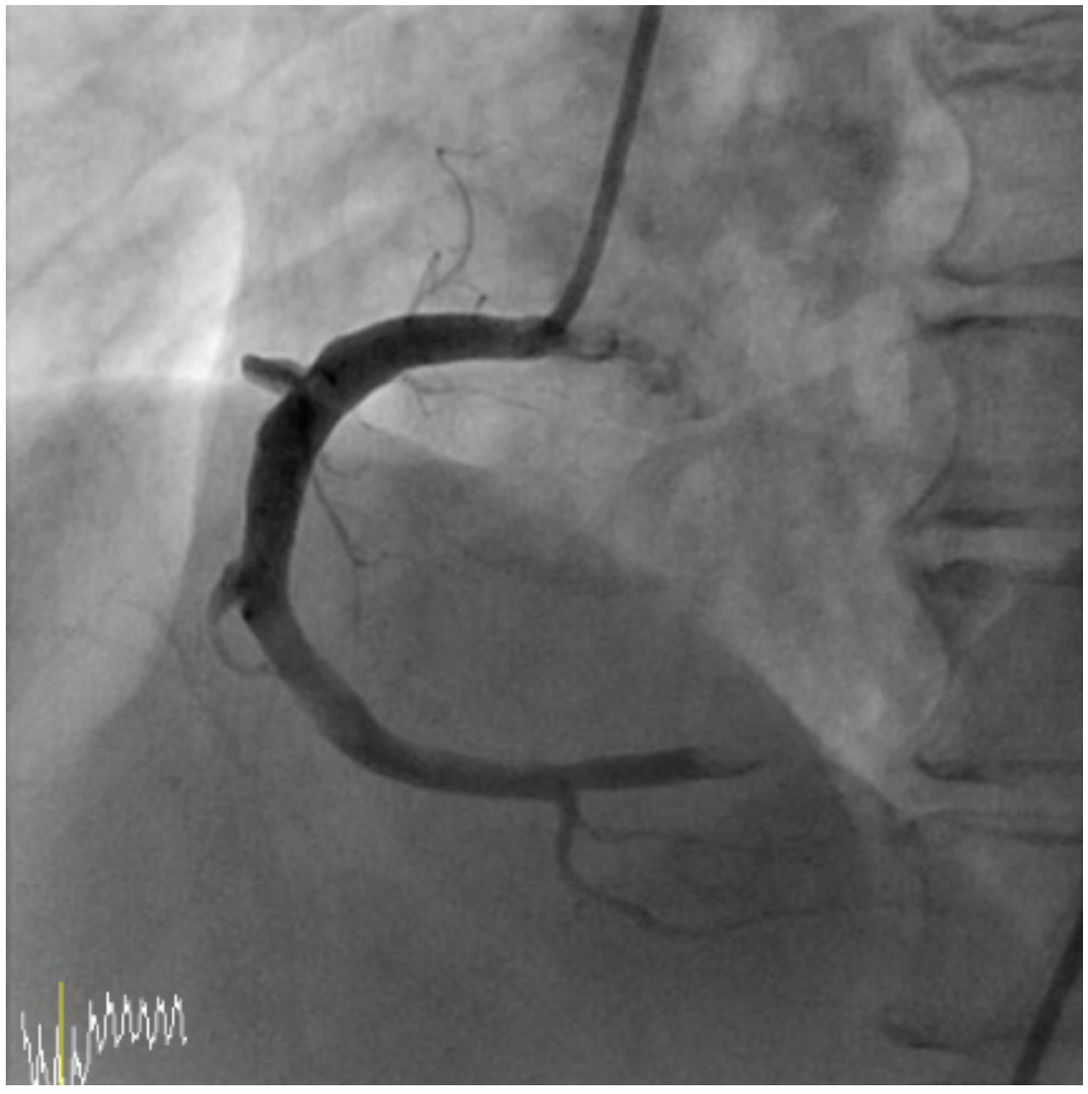
Case 2 // 65 YO female, STEMI (inf)



Aspiration Only without STENT

Aspirin / Ticagrelor
Atorvastatin 40mg
Nicorandil
Diltiazem

Case 2 // 65 YO female, STEMI (inf)



Don’t Be Dazzled by CAG

OCT was useful…

To find true lesion

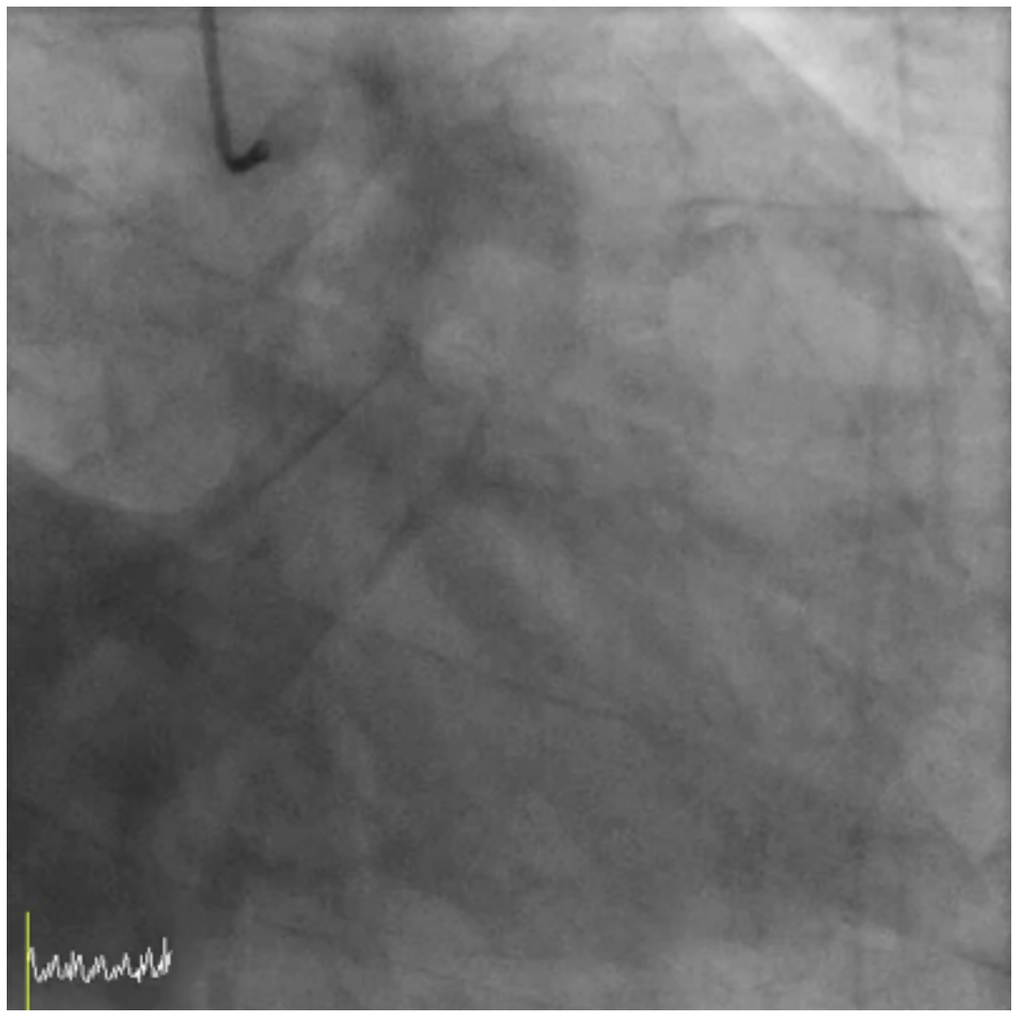
To determine pathophysiology

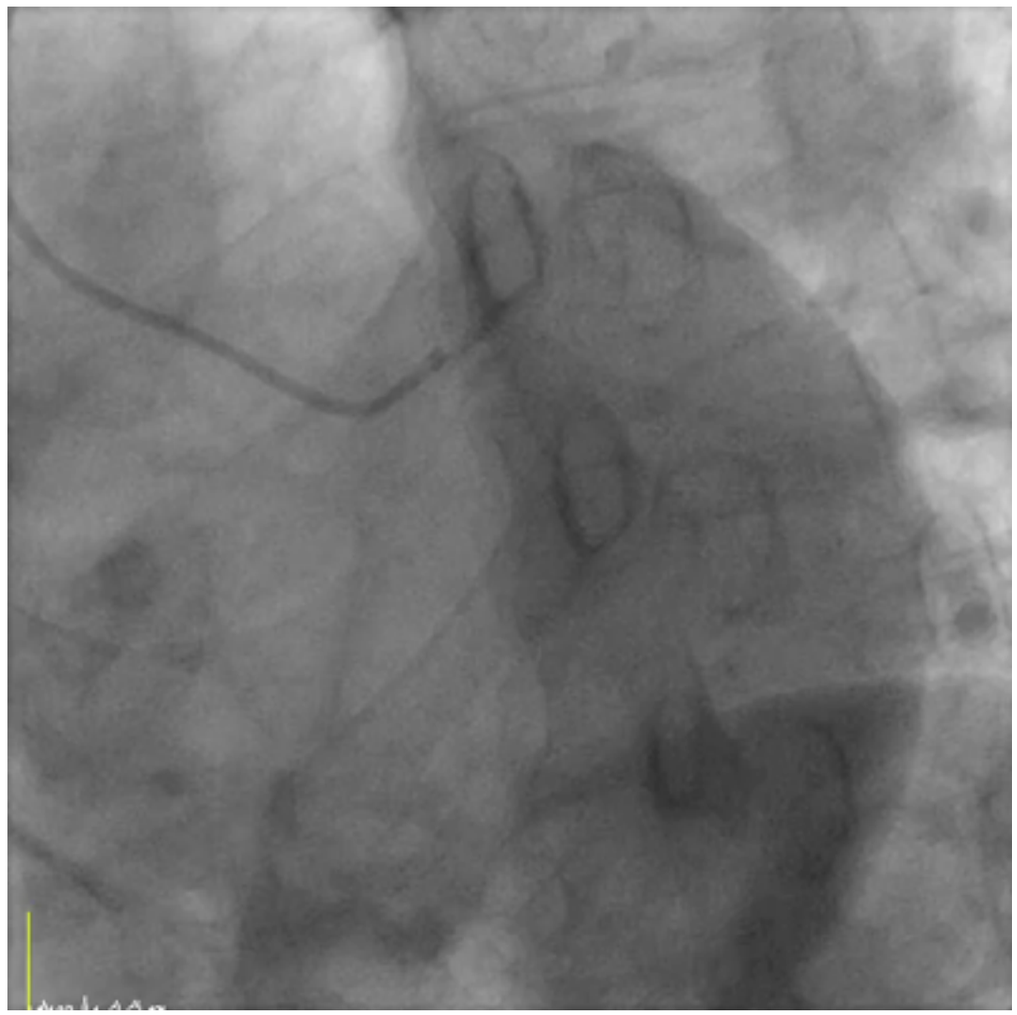
To select proper management

Case 3 // 41 YO Male, NSTEMI

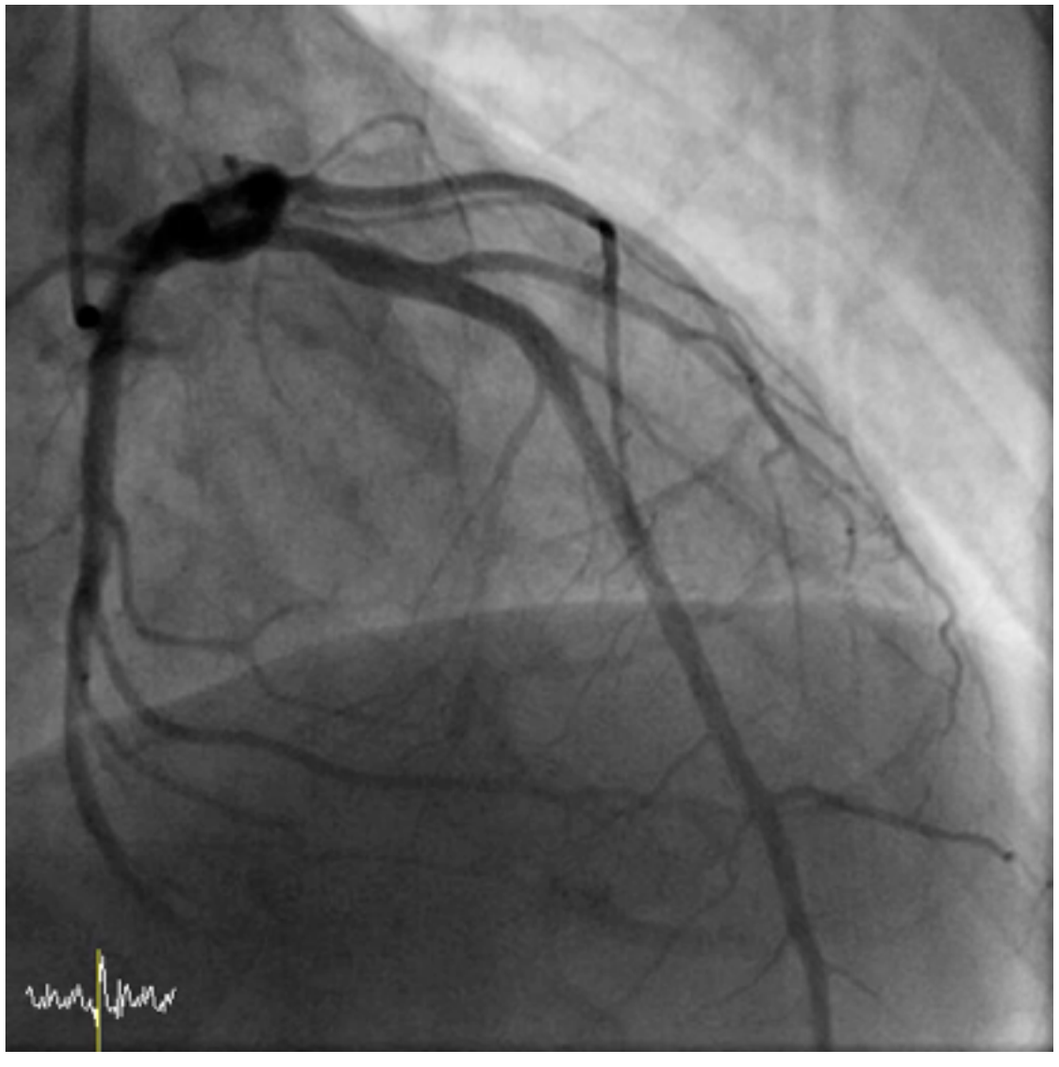
- 41YO Male
- Resting Onset Chest Pain
- Current Smoker
- Alcoholic intake overnight
- Troponin-I ; Elevated (0.026 ng/mL)

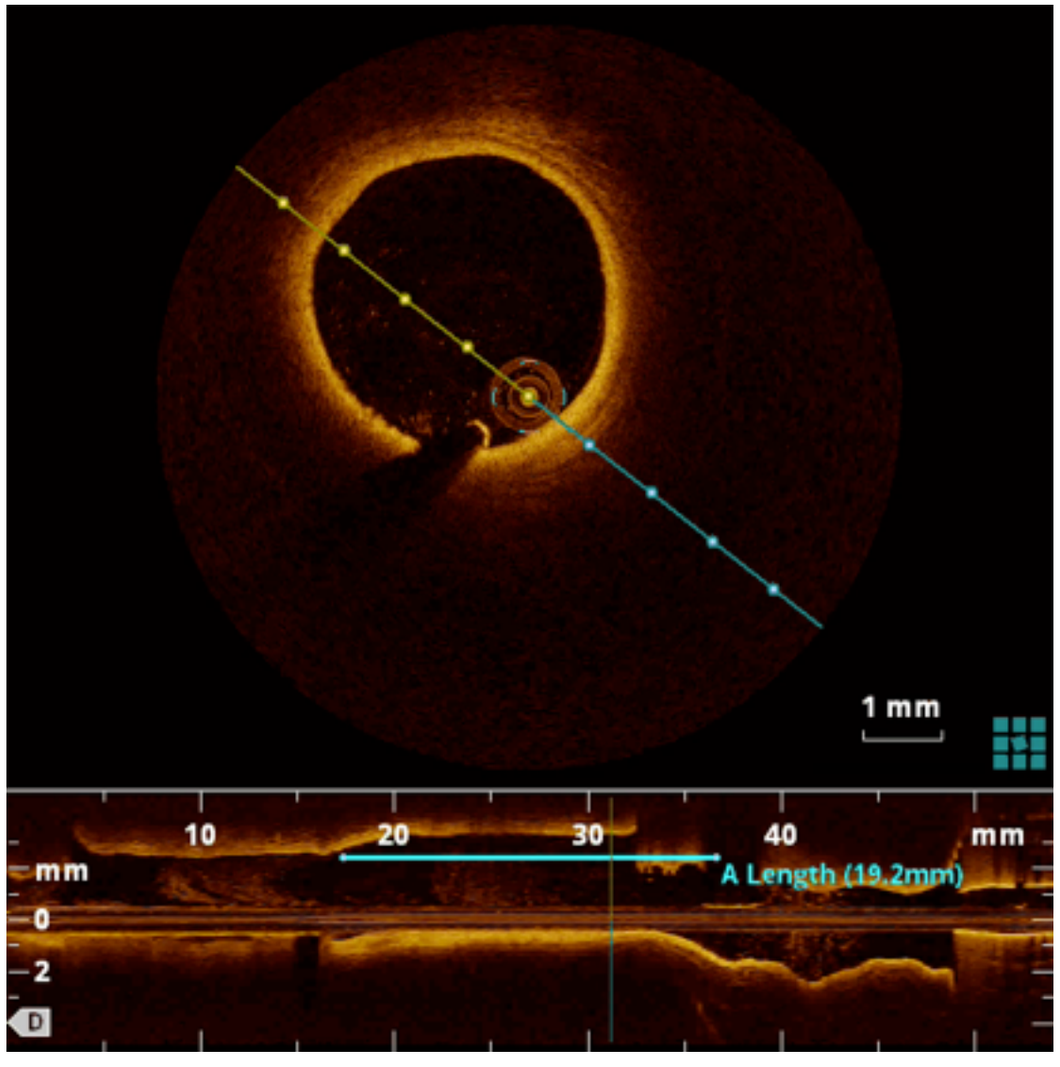
Case 3 // 41 YO Male, NSTEMI



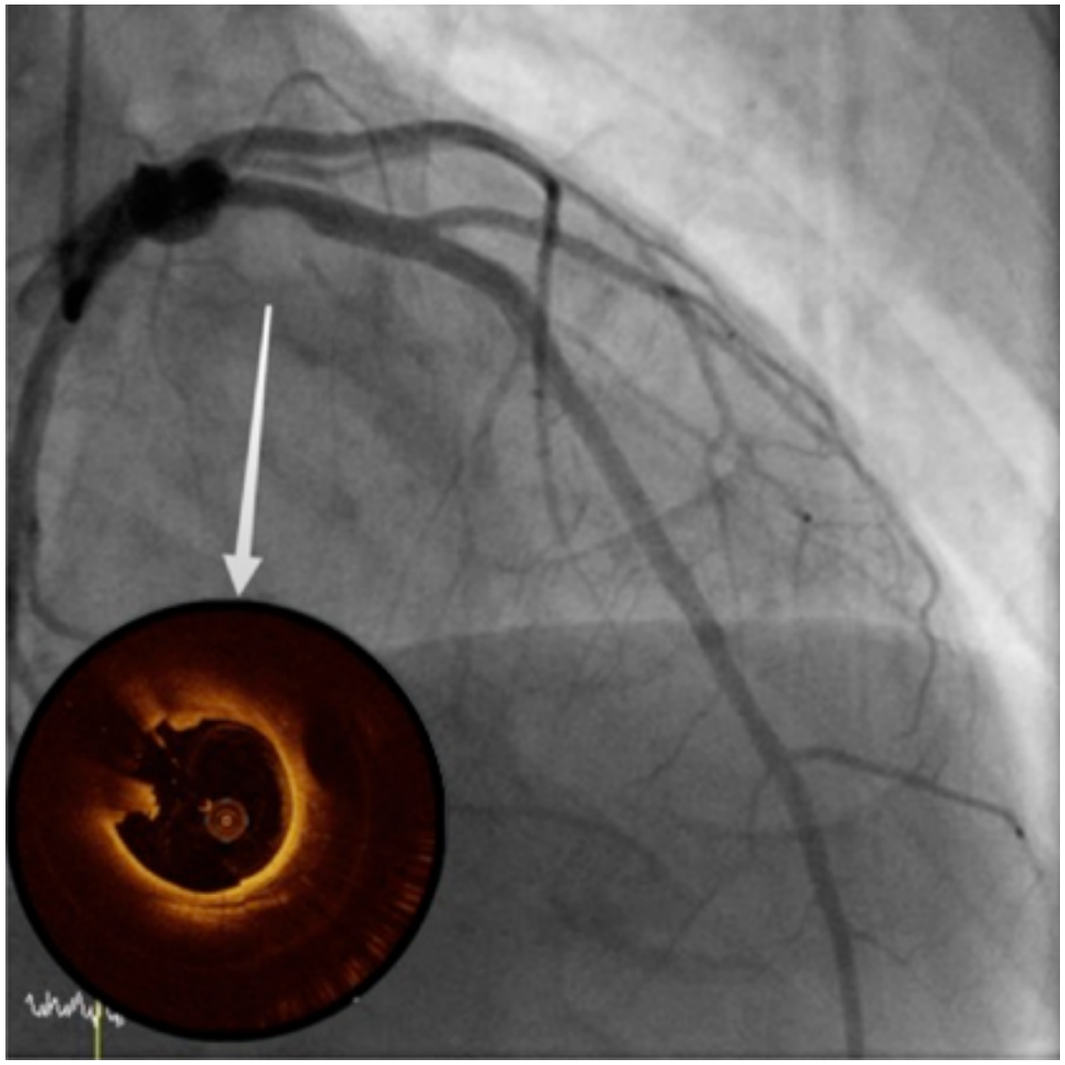


Case 3 // 41 YO Male, NSTEMI





Case 3 // 41 YO Male, NSTEMI



Pathophysiology of Culprit Lesion

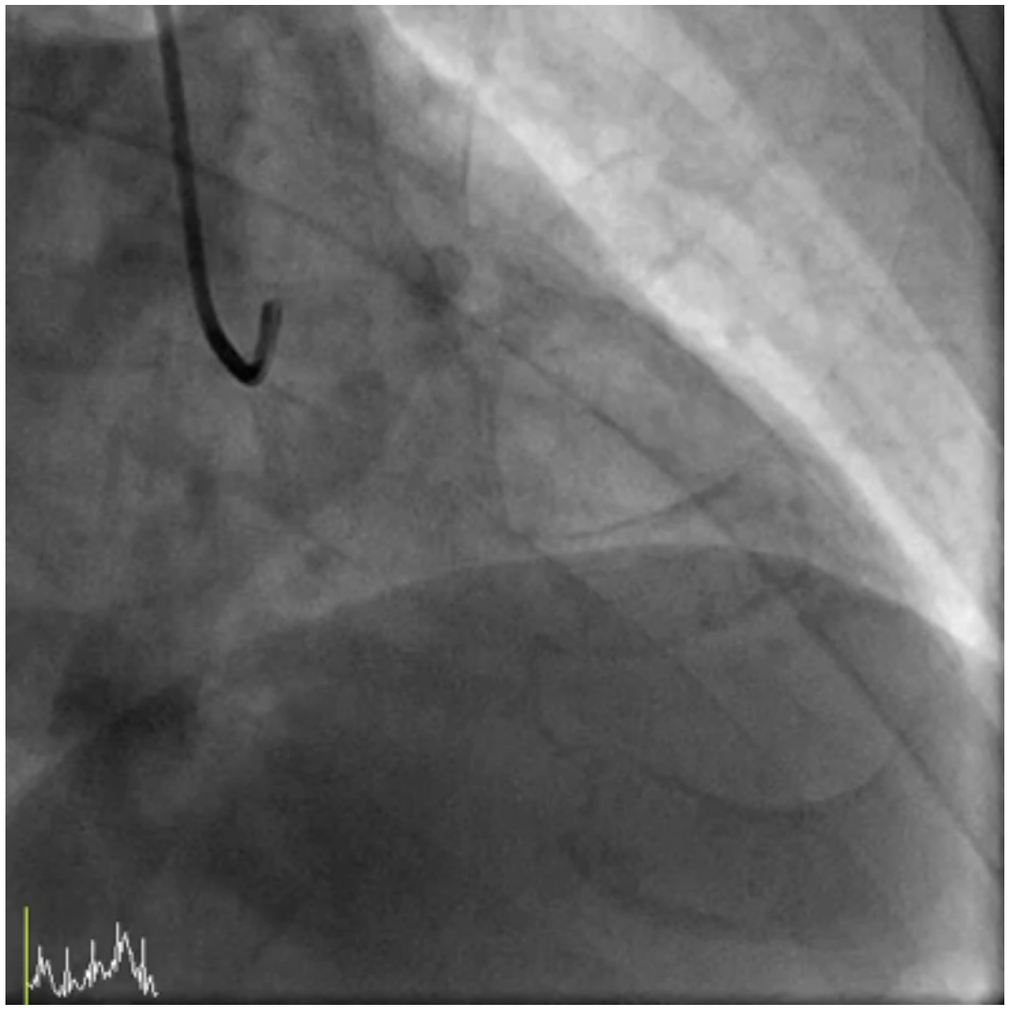
How to treat this lesion ?

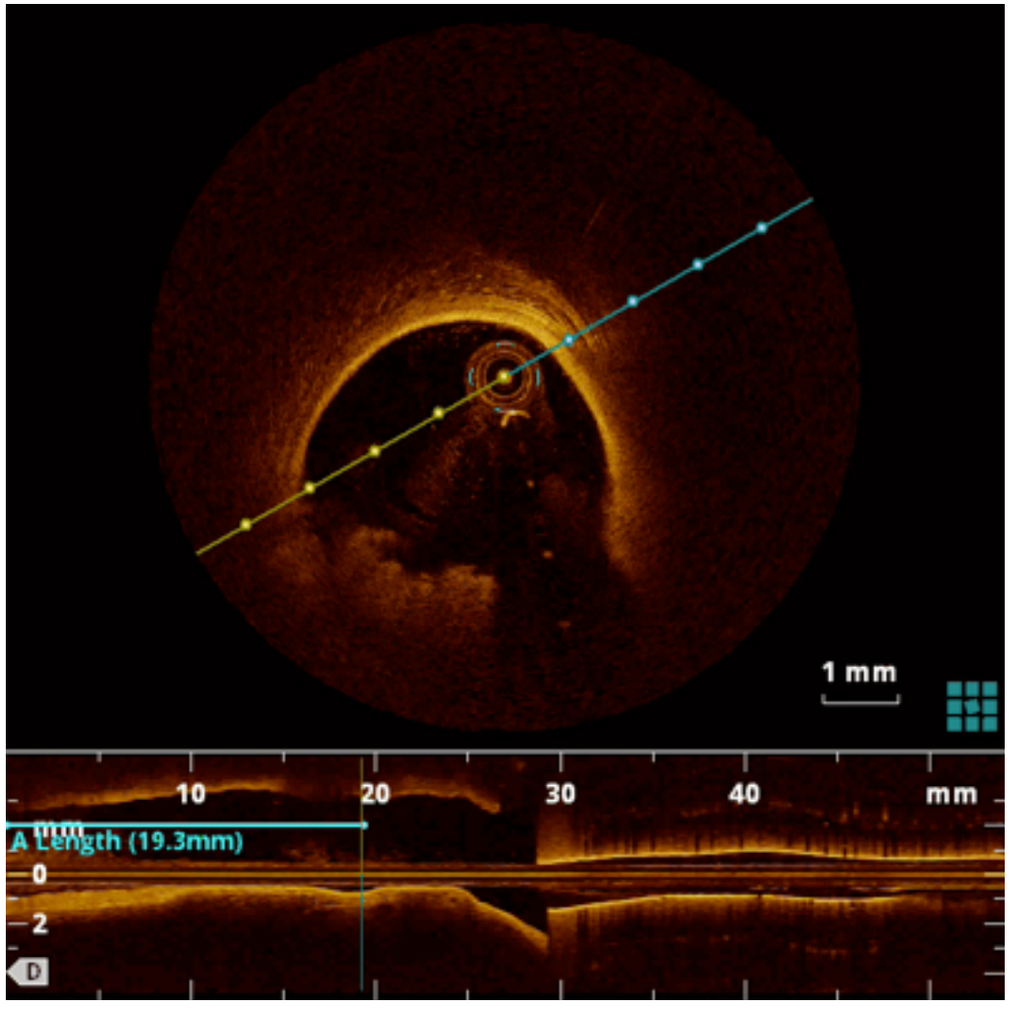
How to evaluate therapeutic effect?

When is proper time to FU

Case 3 // 41 YO Male, NSTEMI

FU CAG & OCT after 3days





Case 3 // 41 YO Male, NSTEMI

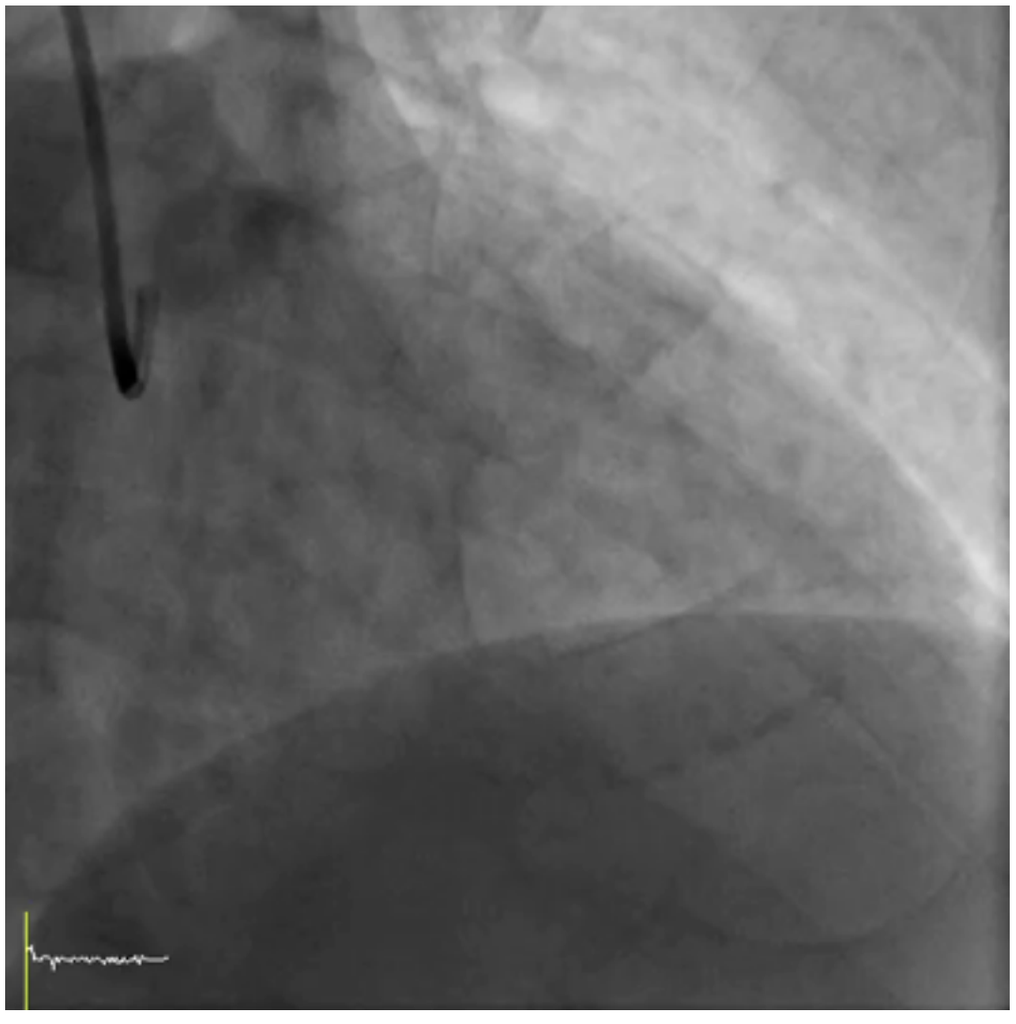
Aspirin // Ticagrelor

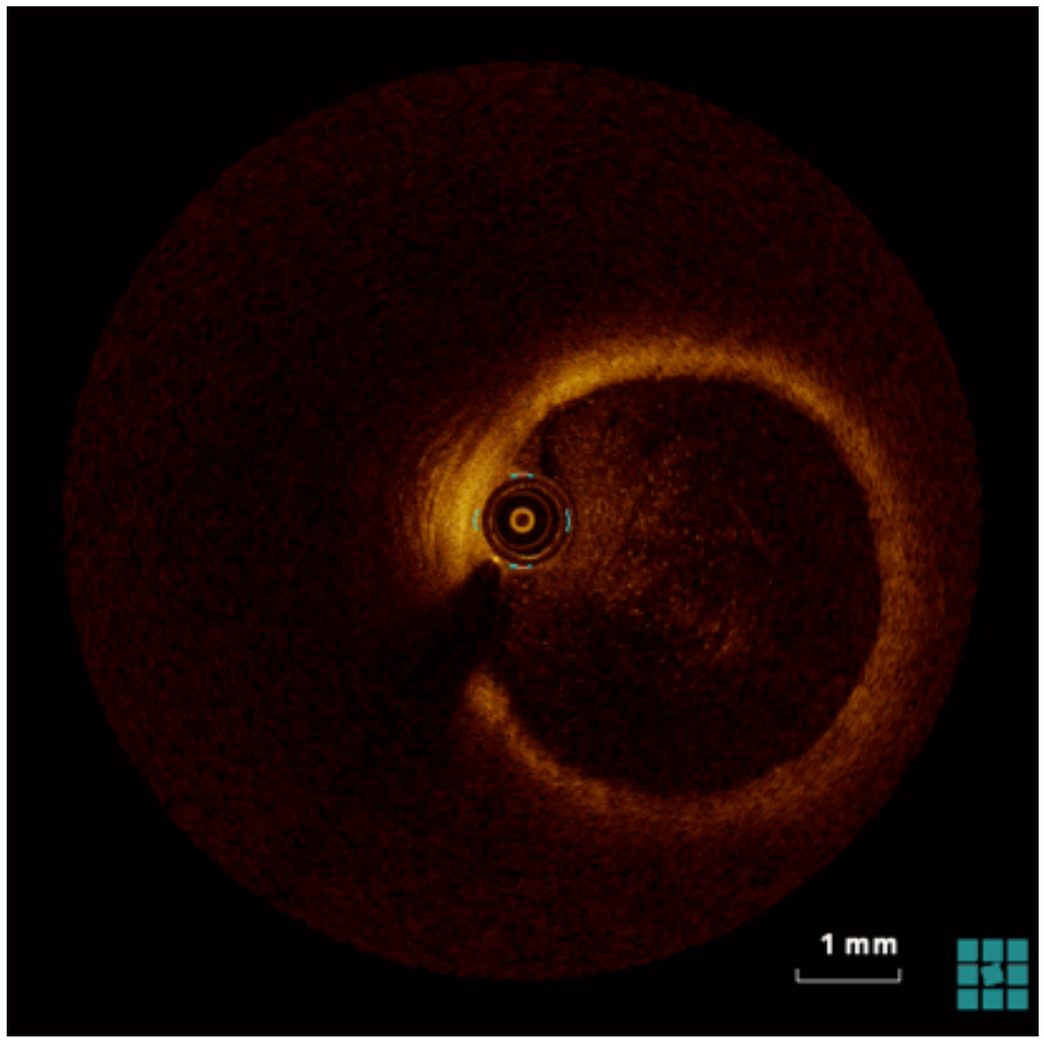
Atorvastatin 40mg

Amlodipine 5mg

Case 3 // 41 YO Male, NSTEMI

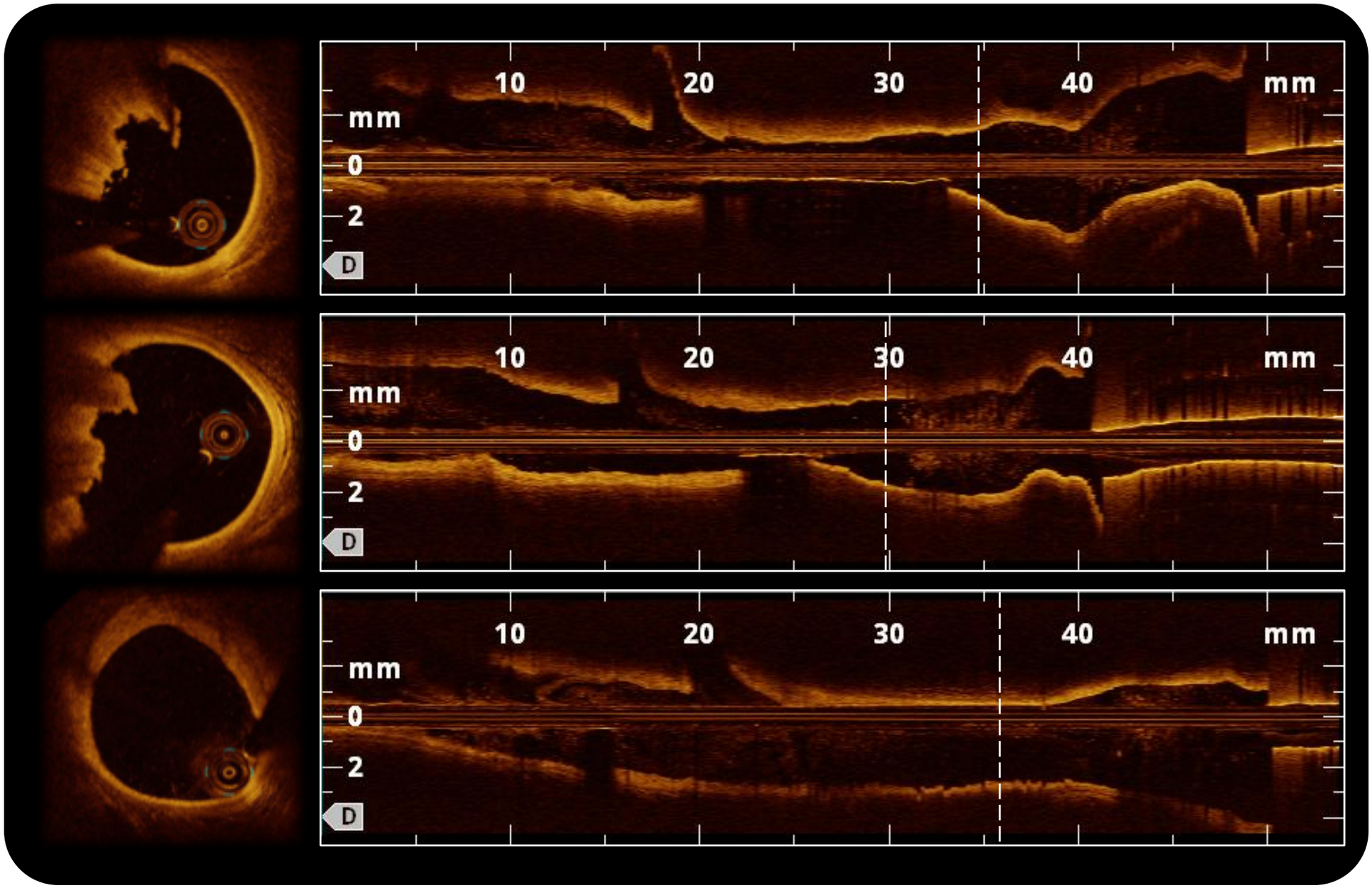
FU CAG & OCT after 12 months





Case 3 // 41 YO Male, NSTEMI

FU CAG & OCT after 12 months



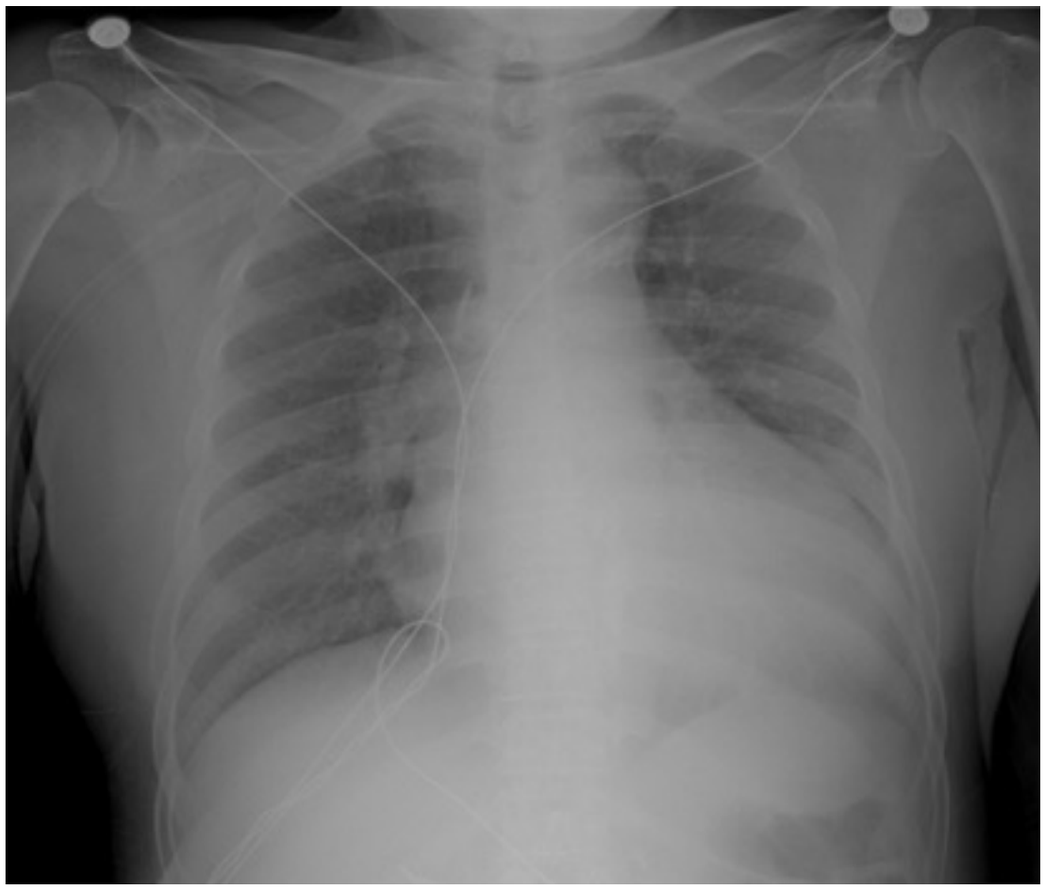
Case 3 // 41 YO Male, NSTEMI

Stop Smoking & Alcohol

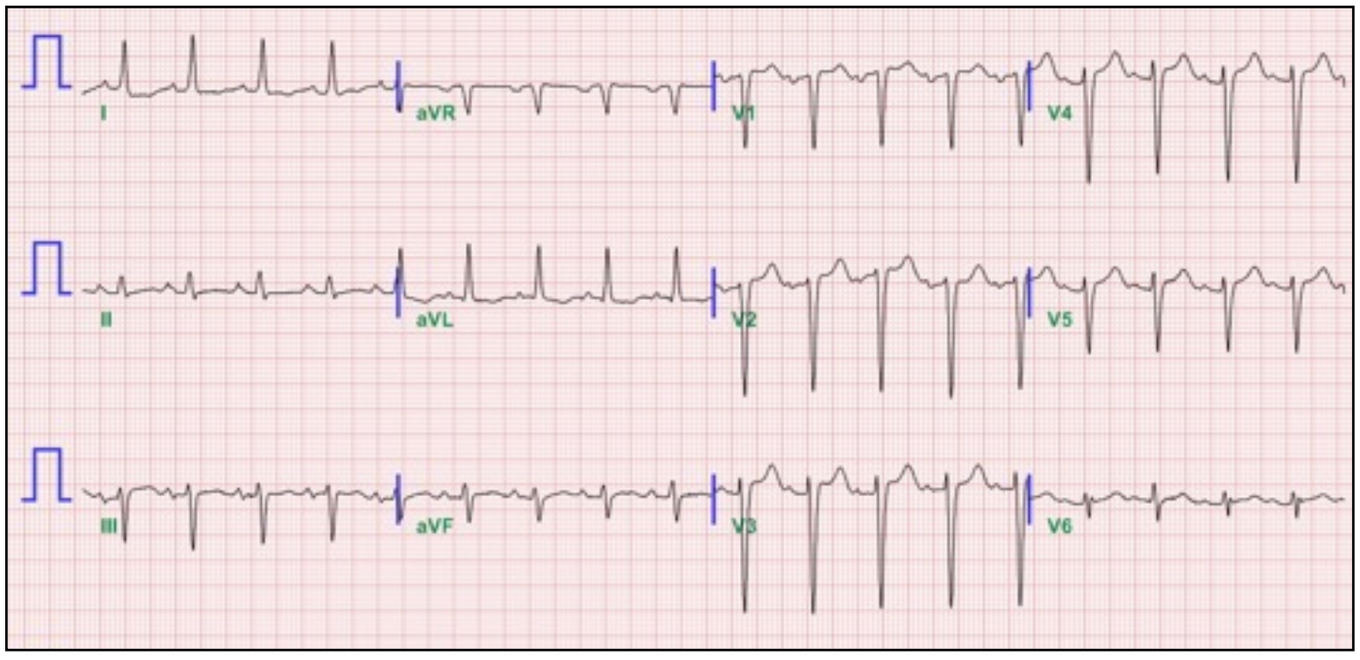
Atorvastatin 20 mg

Amlodipine 2.5mg

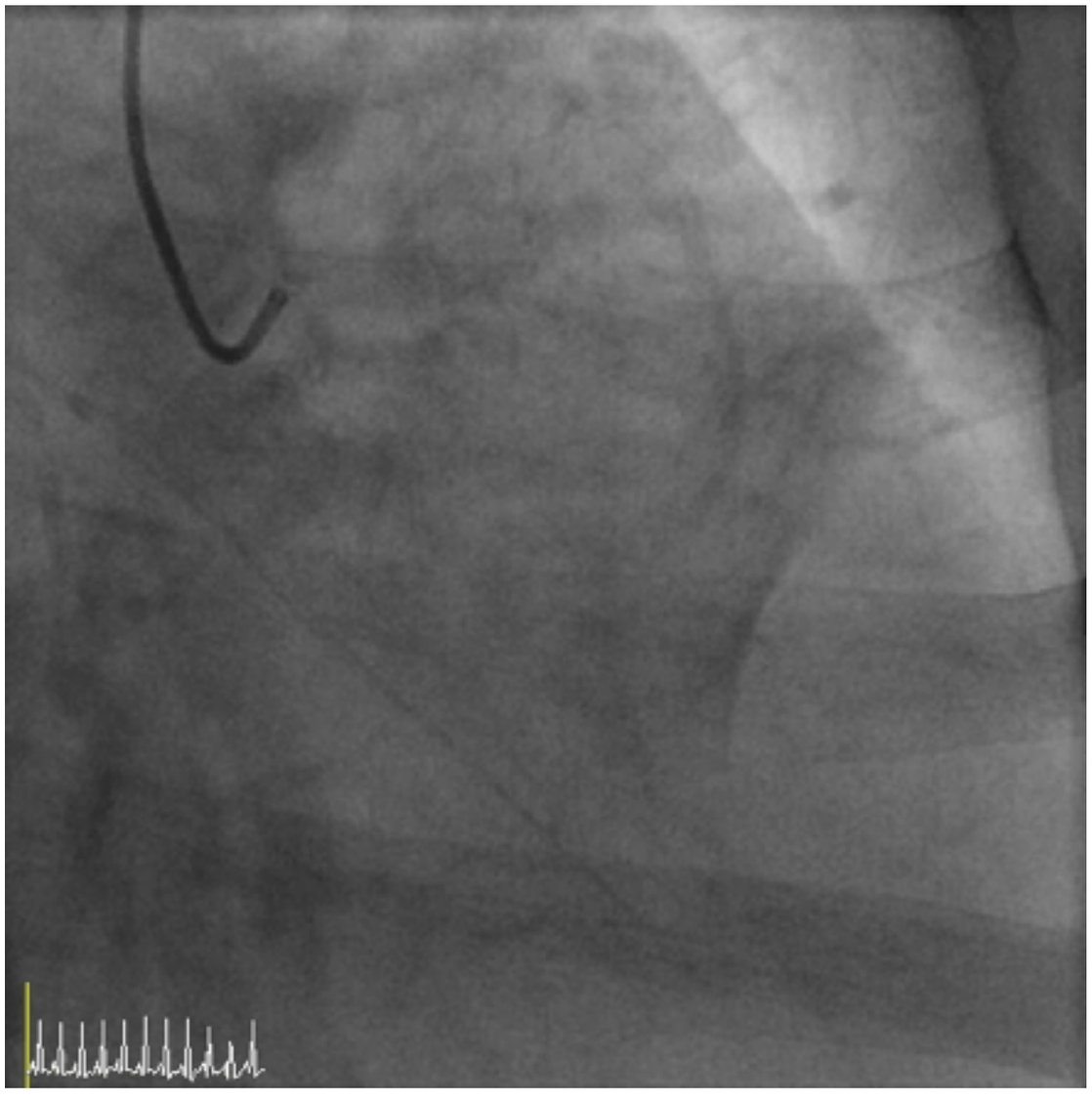
Case 4 / 66YO Female, Ischemic DCM

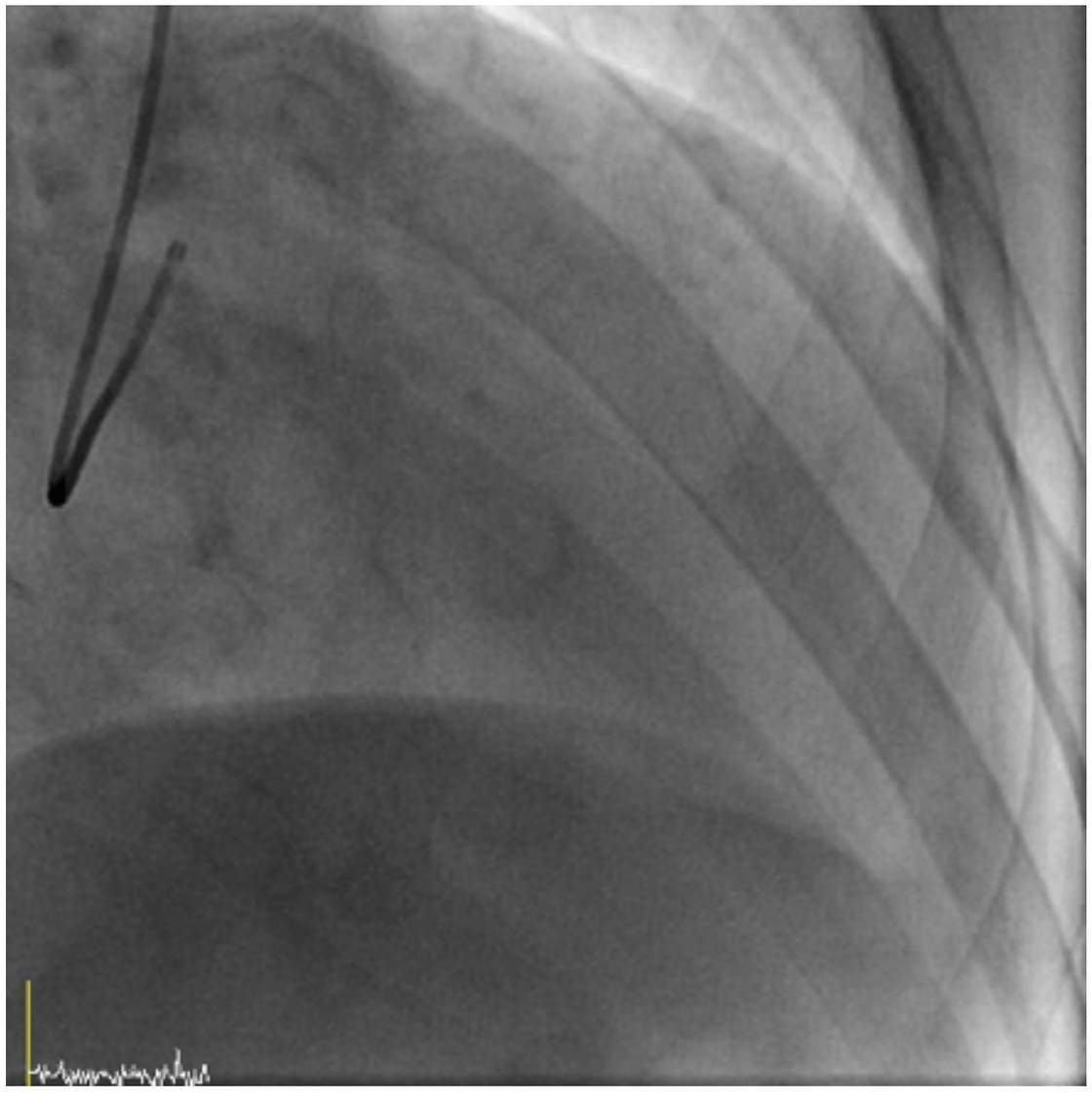


- ✓ CKMB/cTnI: 117.8/1.07
- ✓ NT proBNP: 8618.3 ng/mL
- ✓ TTE: **EF 15%**, LVDd/s 6.48/5.83, LAD 4.06



Case 4 / 66YO Female, Ischemic DCM





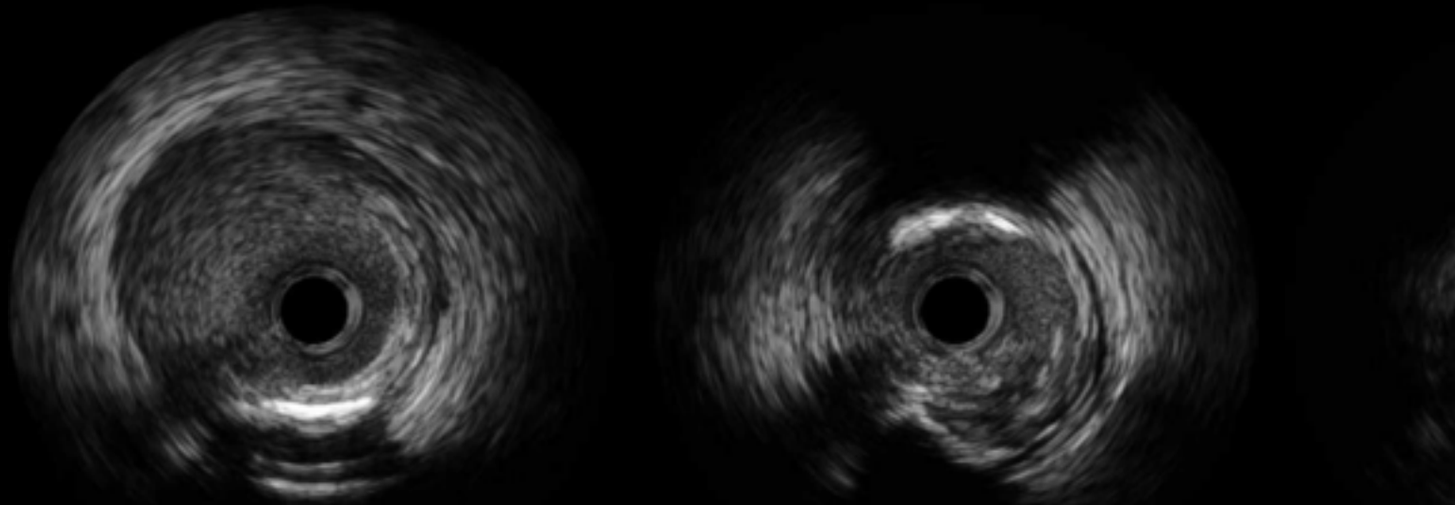
Case 4 / 66YO Female, Ischemic DCM

What is the **mechanism** of this lesion?

How to treat this lesion?

surgery or stent?

DES or BMS or Graft Stent

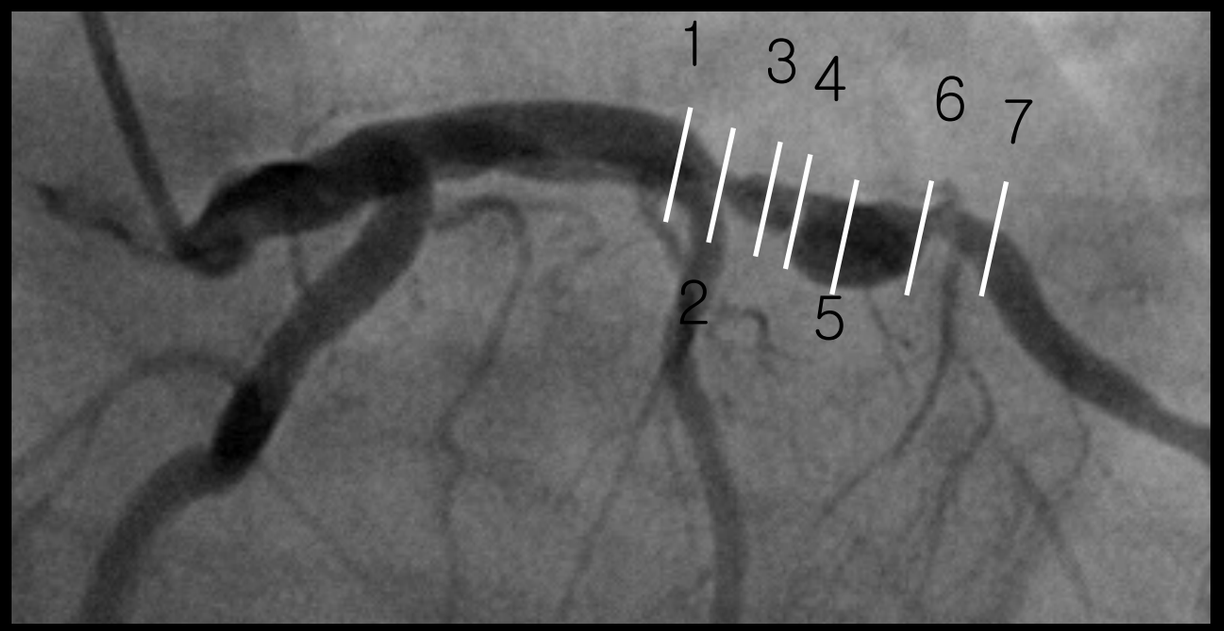


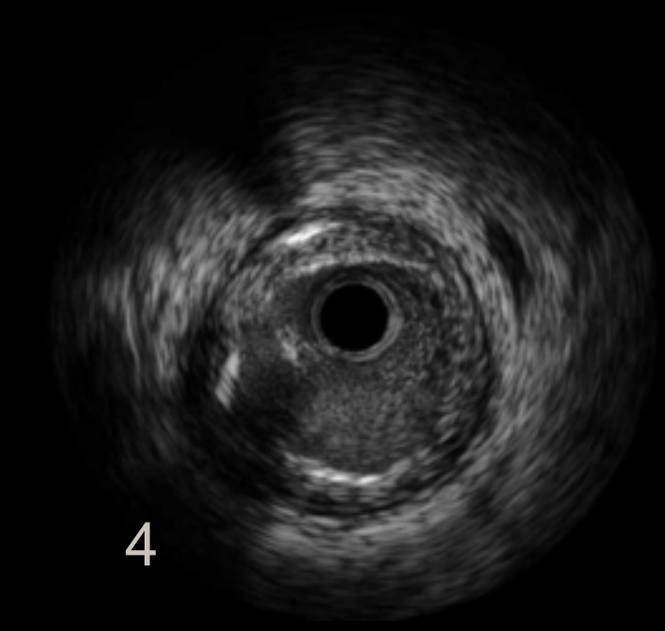
1 VD 4.49mm

2 2.97mm2

3

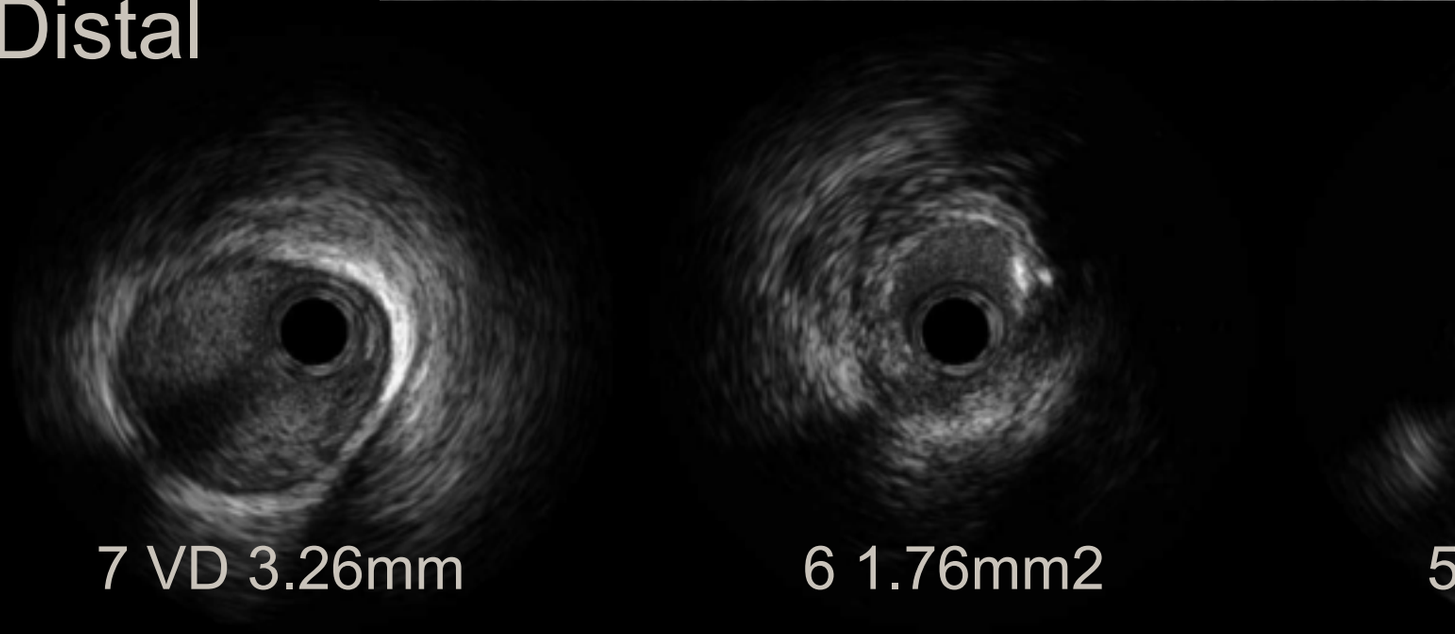
Proximal →





4

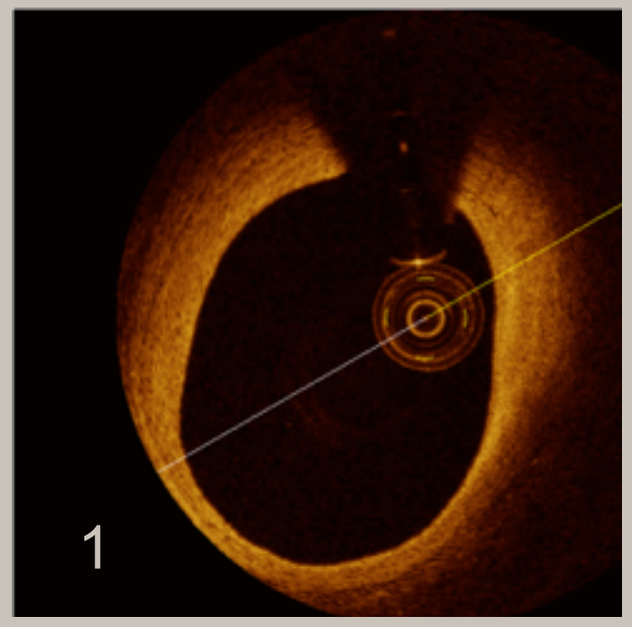
← Distal

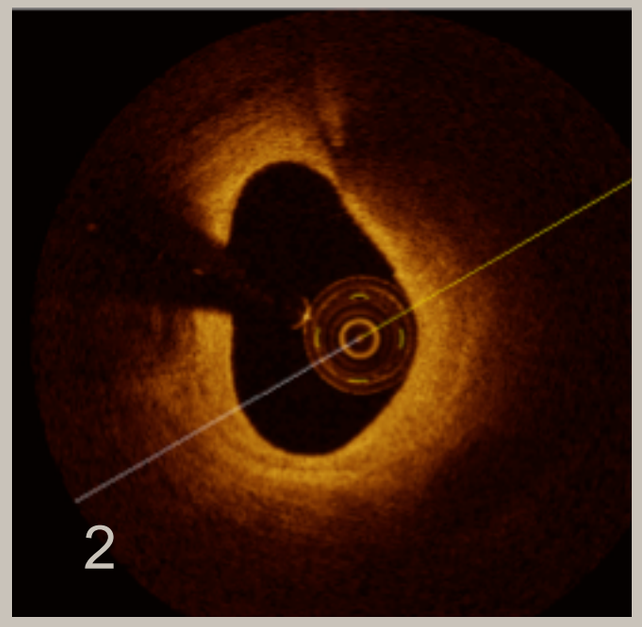


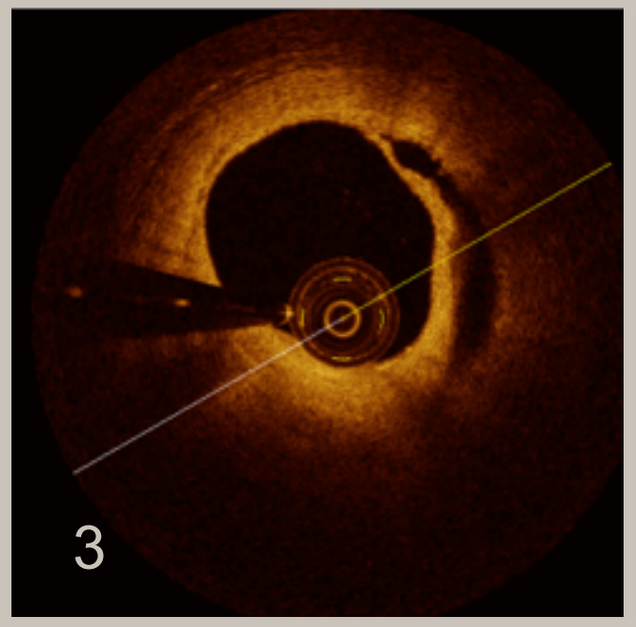
7 VD 3.26mm

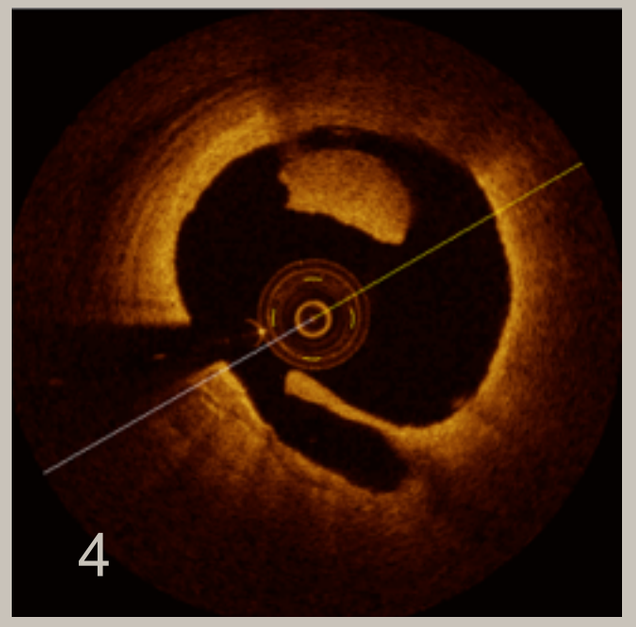
6 1.76mm2

5 VD 6.2mm

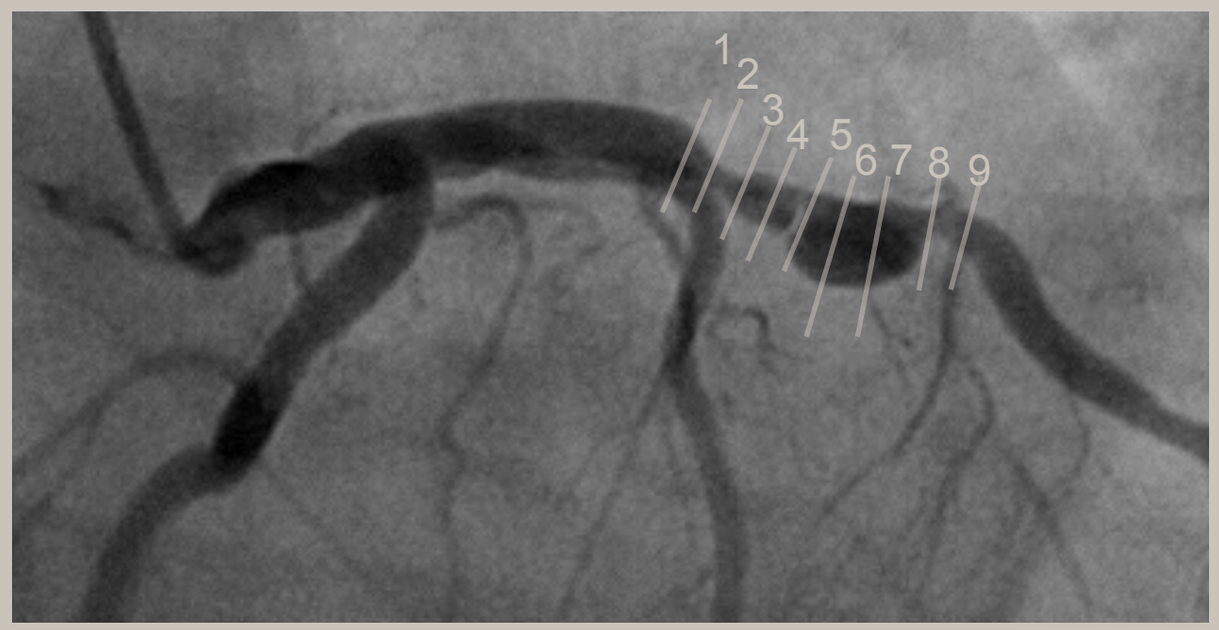




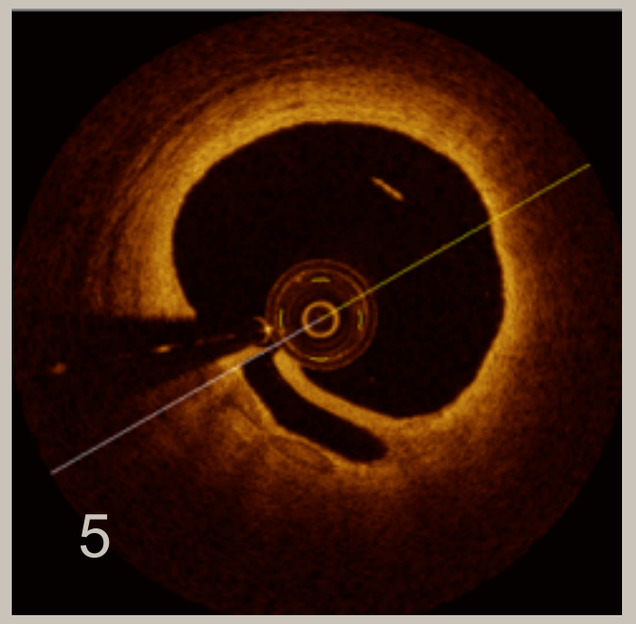


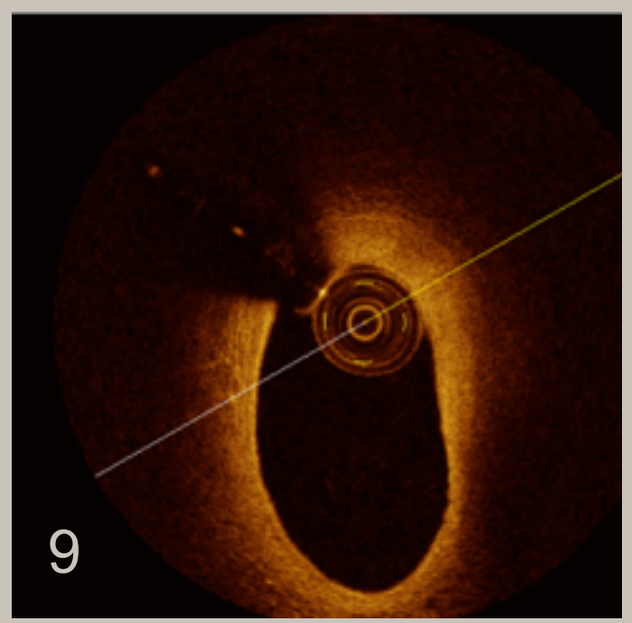


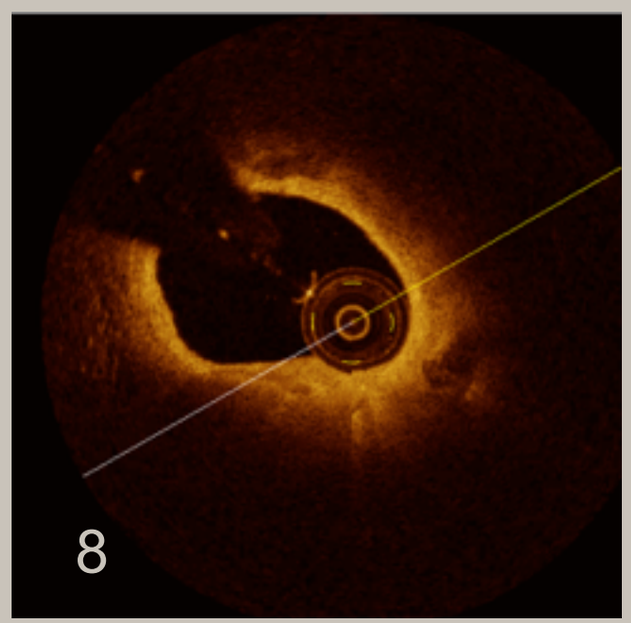
Proximal →

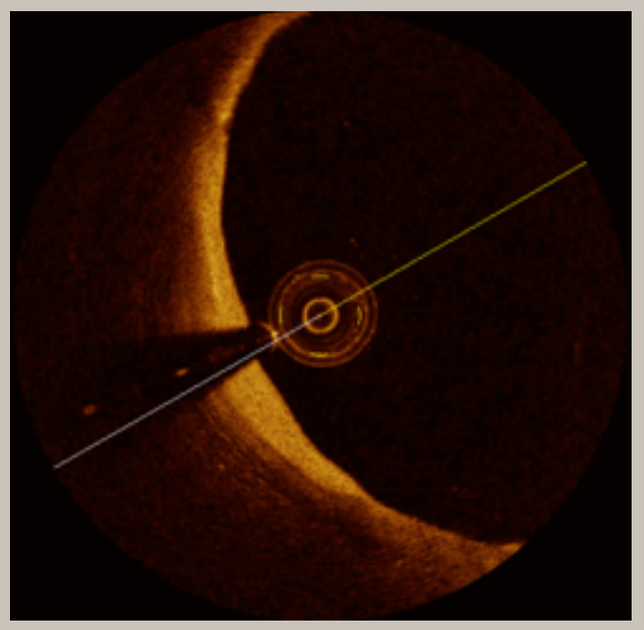


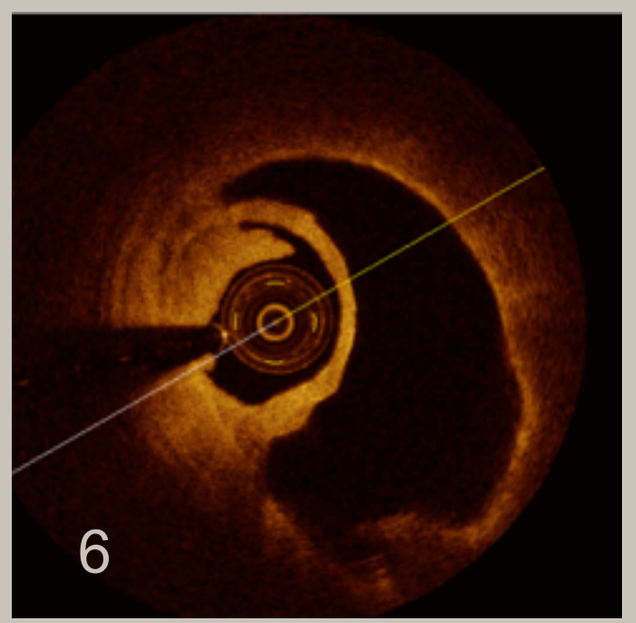
← Distal



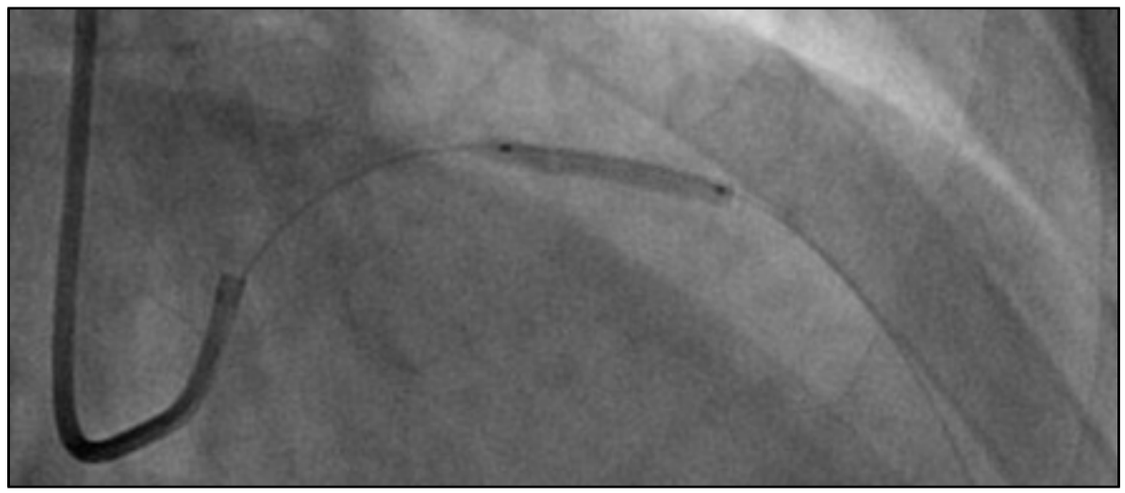




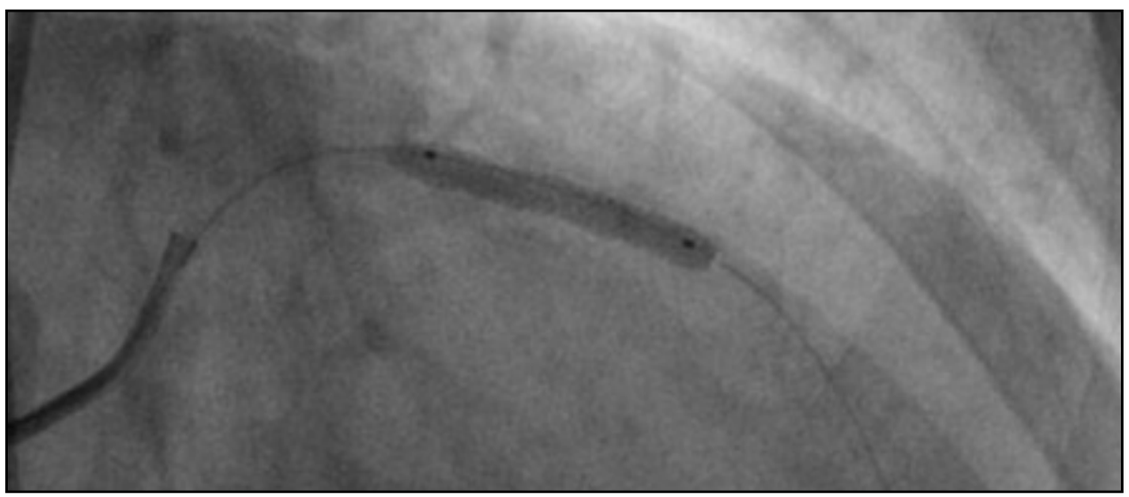




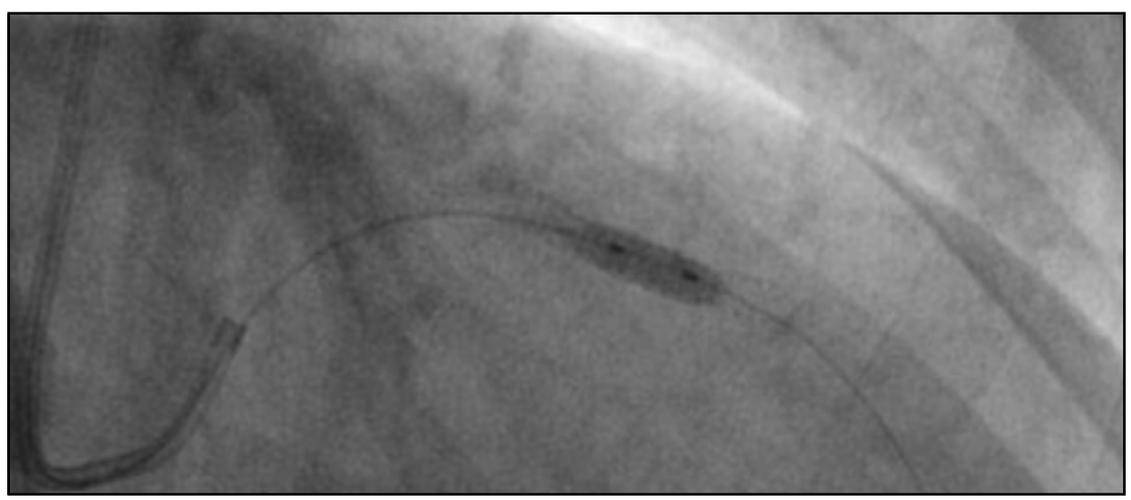
Case 4 / 66YO Female, Ischemic DCM



Ikazuchi 2.5*20, 10 atm

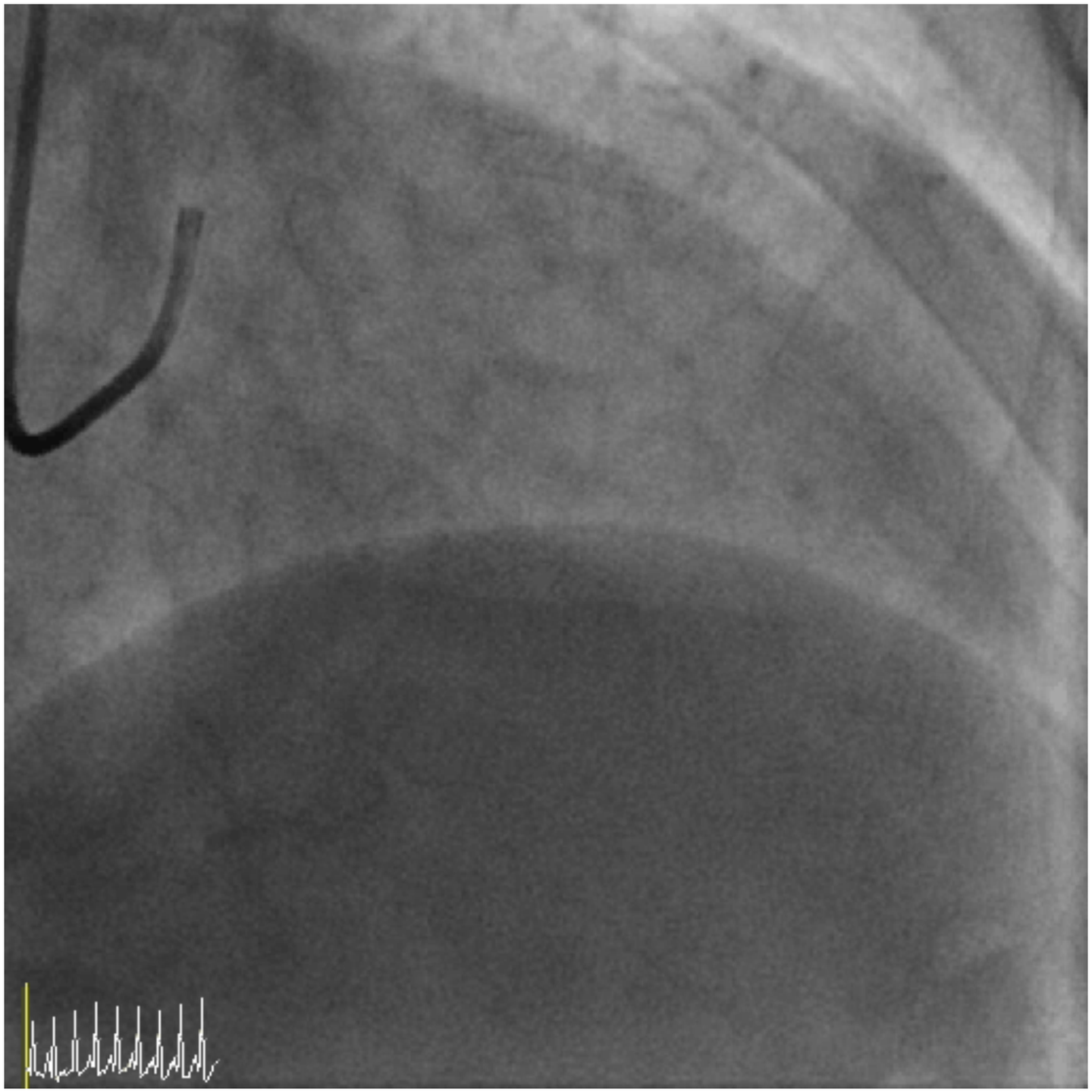


Vision, 3.5*23, 9 atm

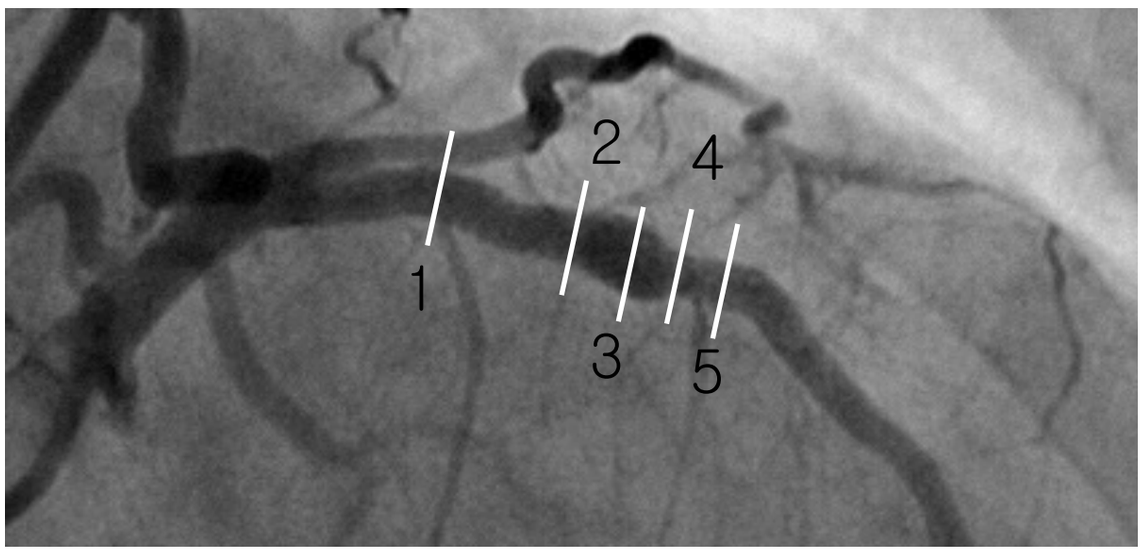


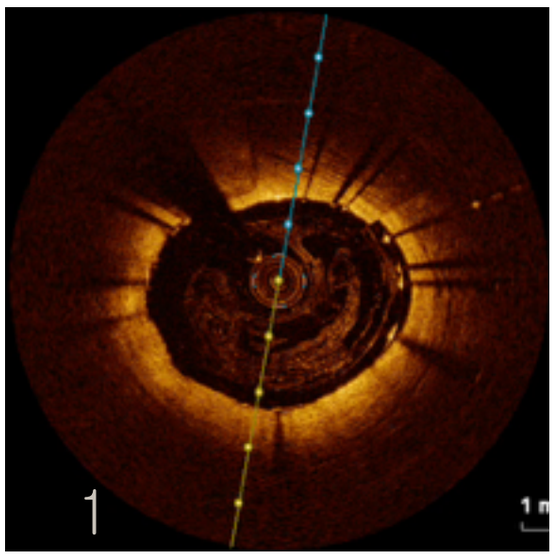
Quantum, 4.0*8, 20 atm

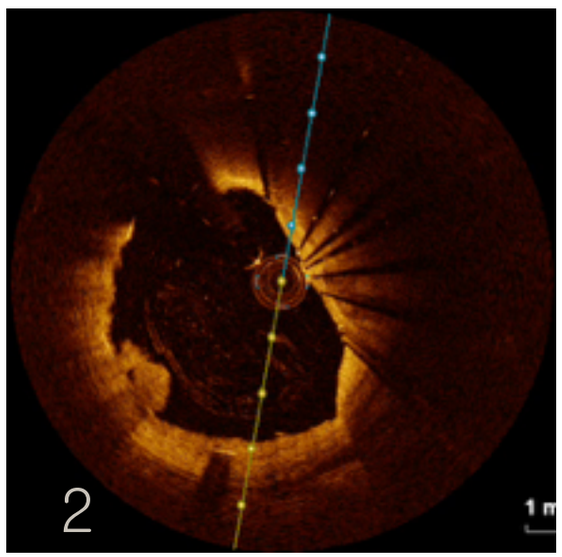
Case 4 / 66YO Female, Ischemic DCM

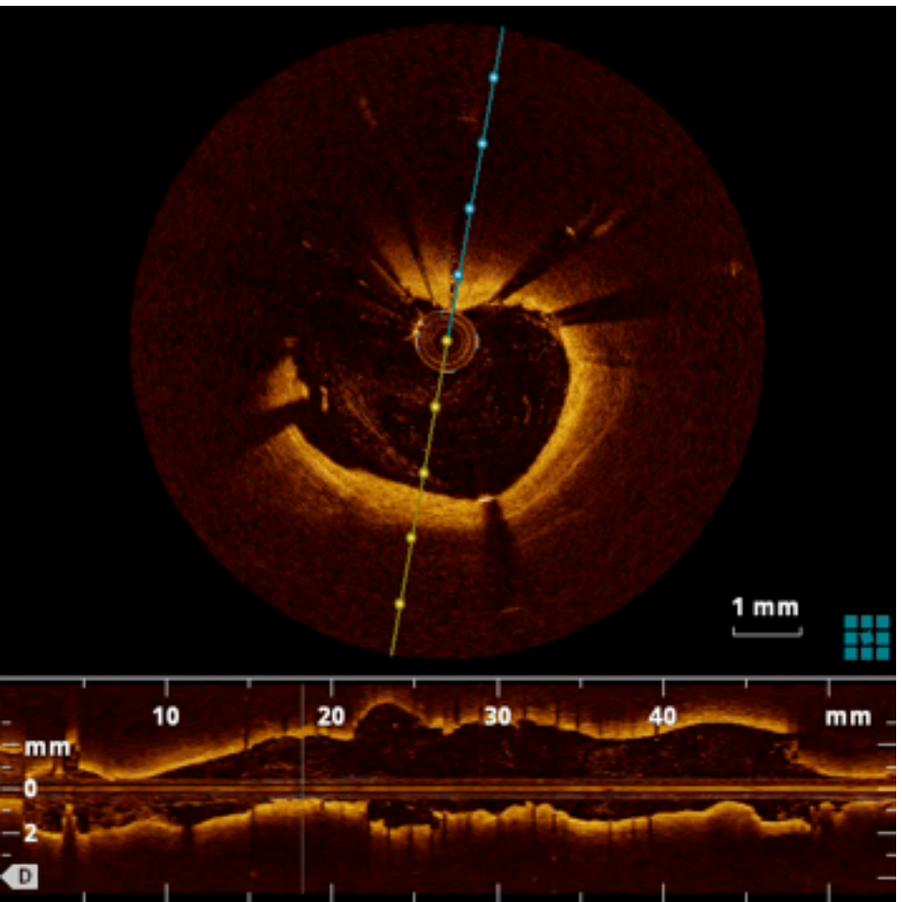


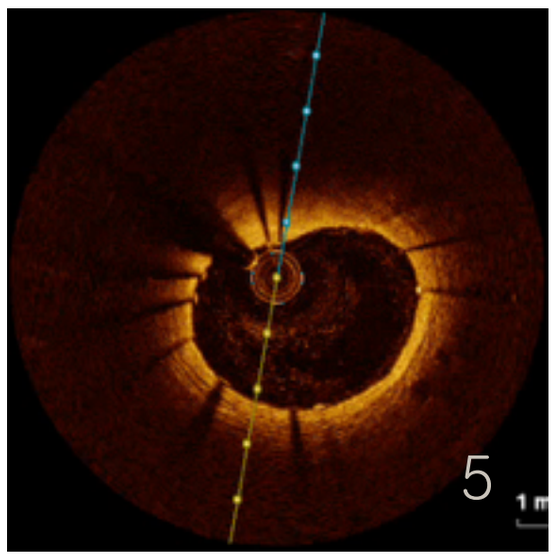
Case 4 / 66YO Female, Ischemic DCM

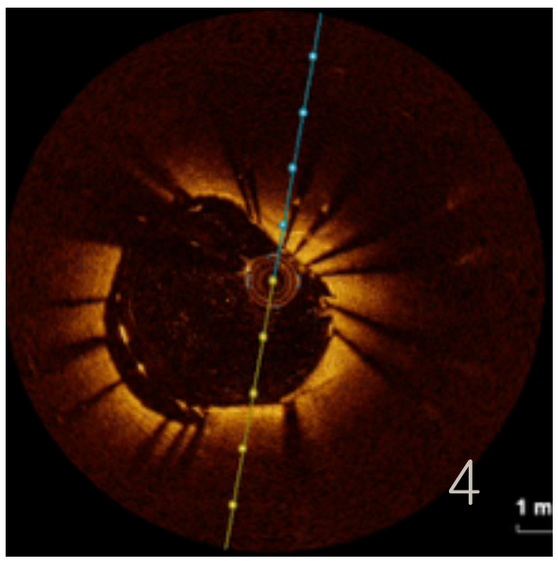


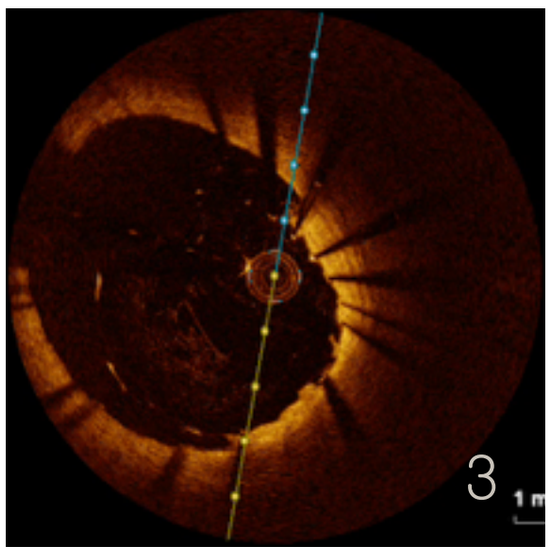






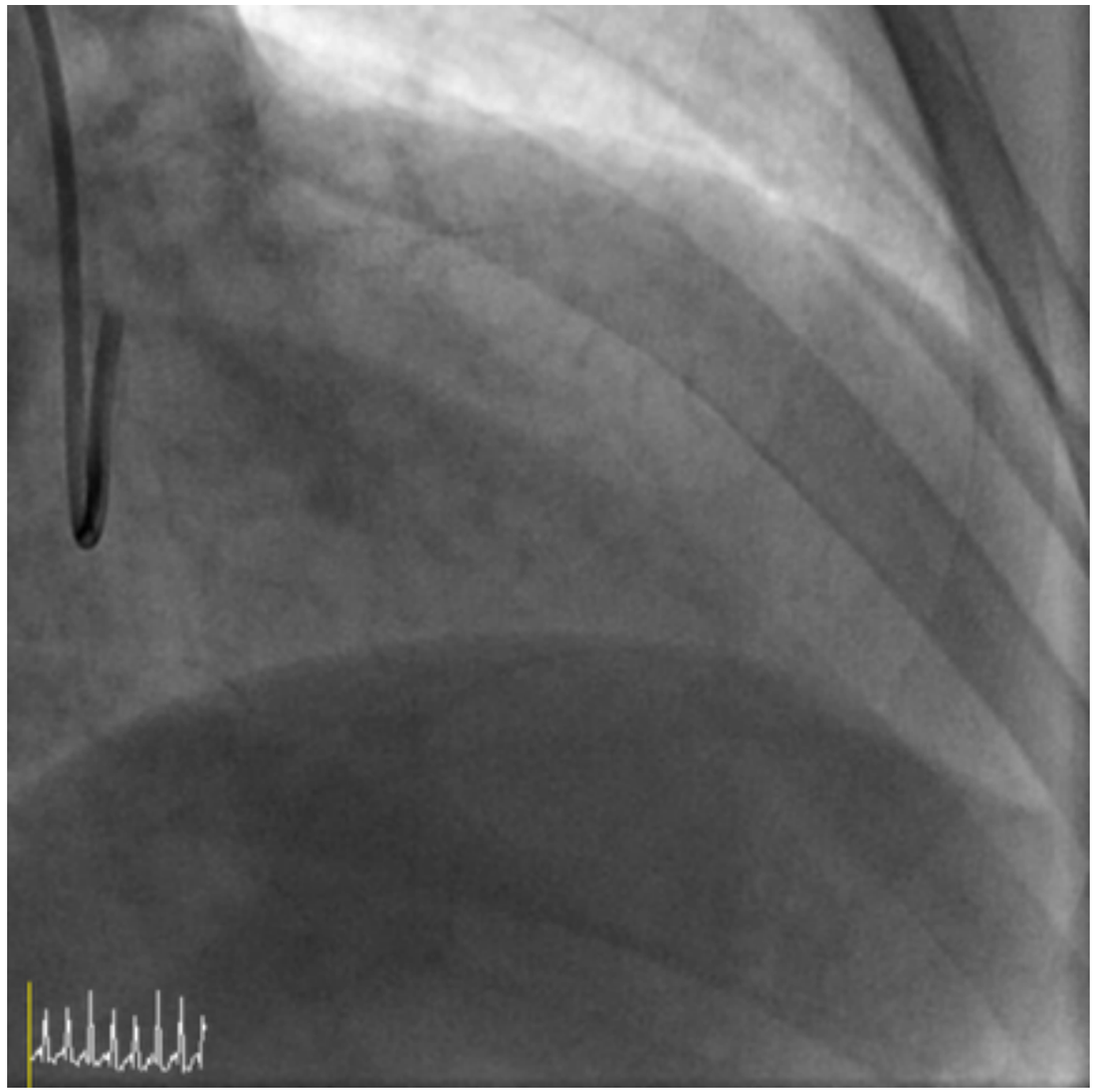


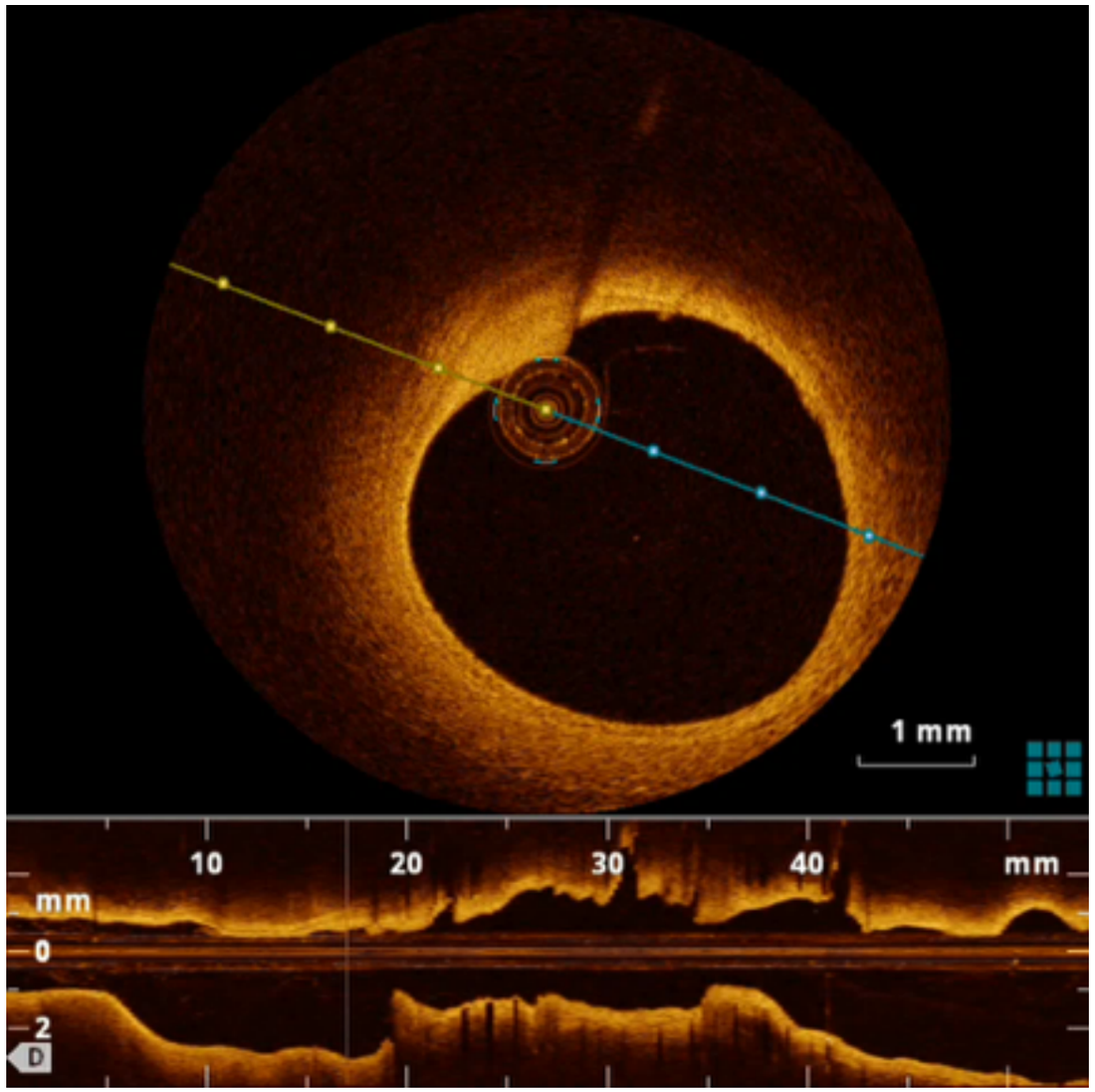




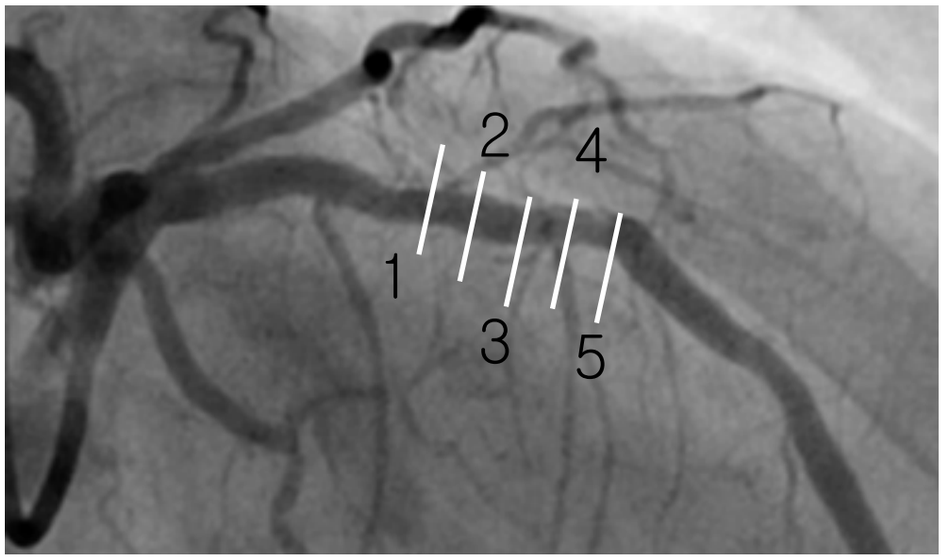
Case 4 / 66YO Female, Ischemic DCM

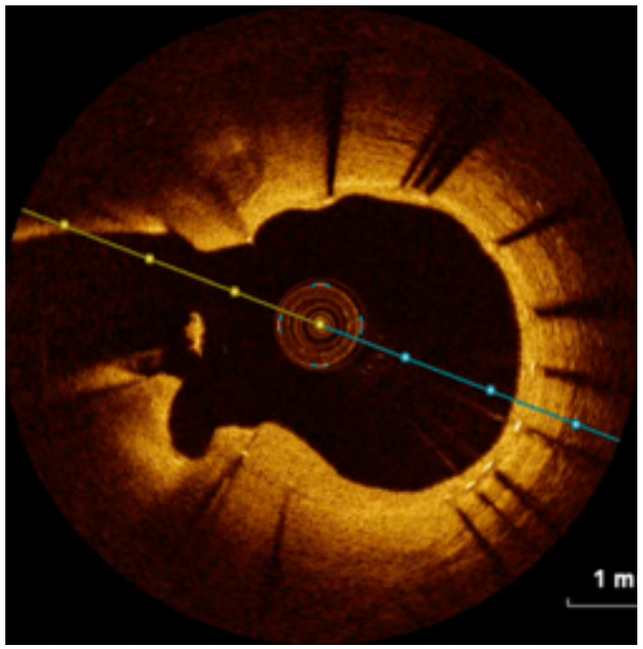
3 months later

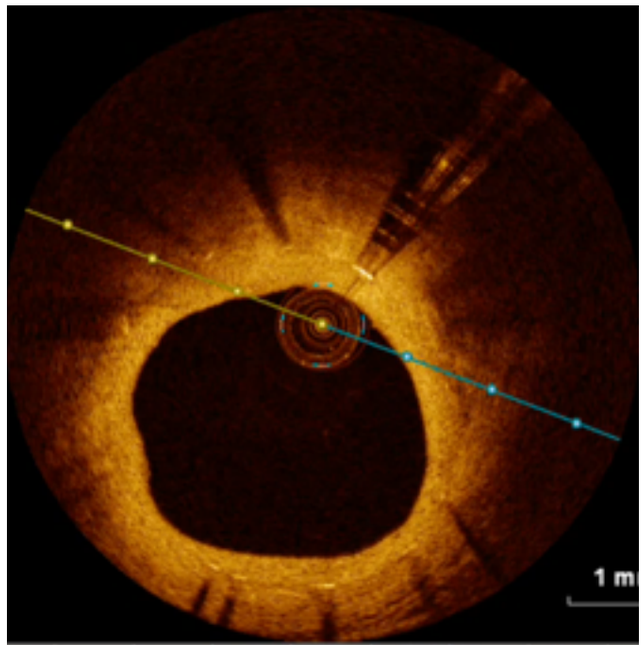


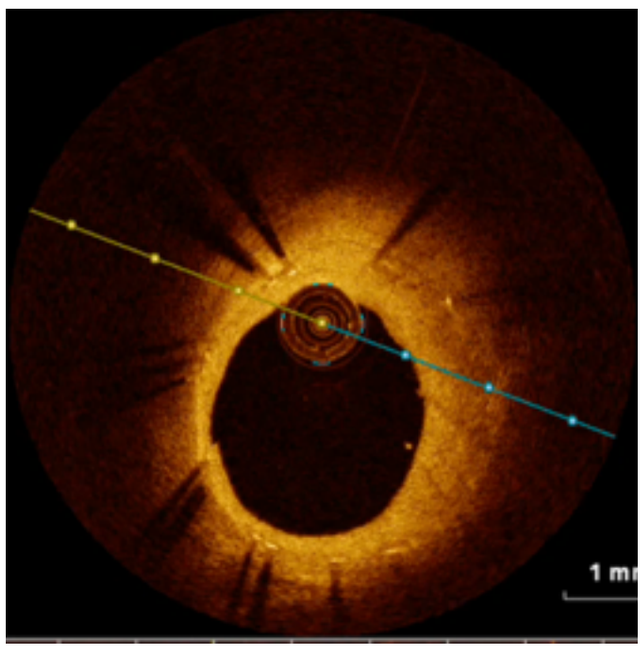


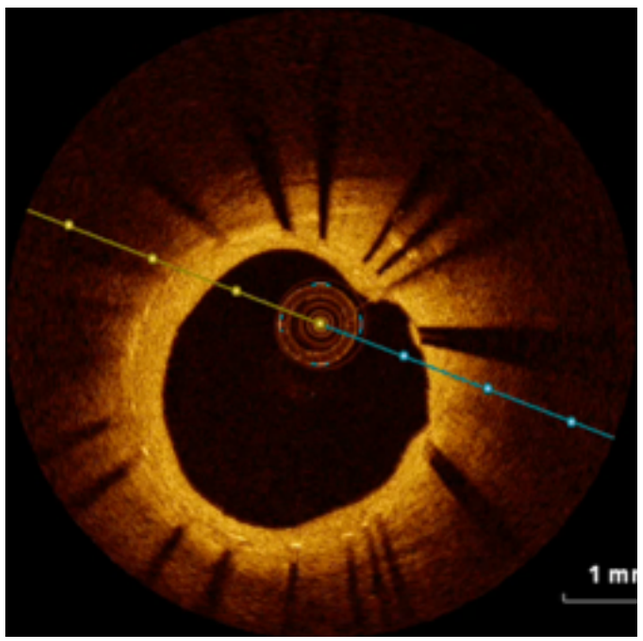
Case 4 / 66YO Female, Ischemic DCM

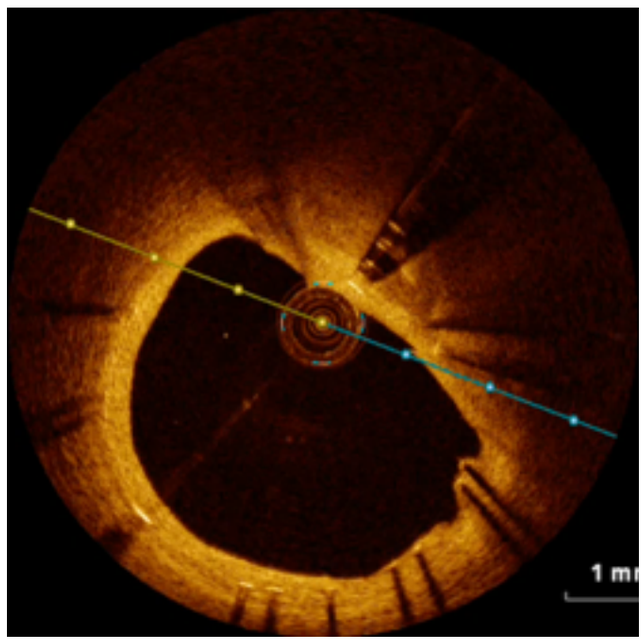




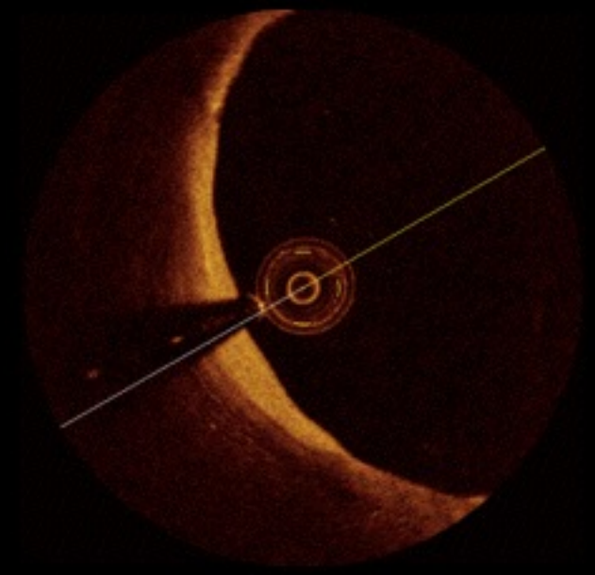


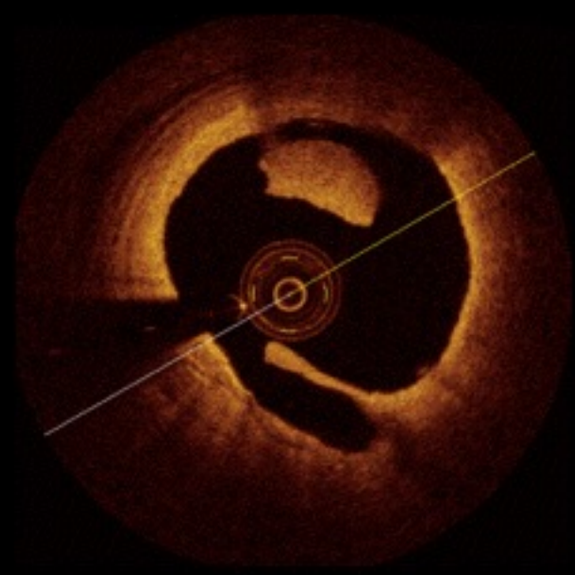




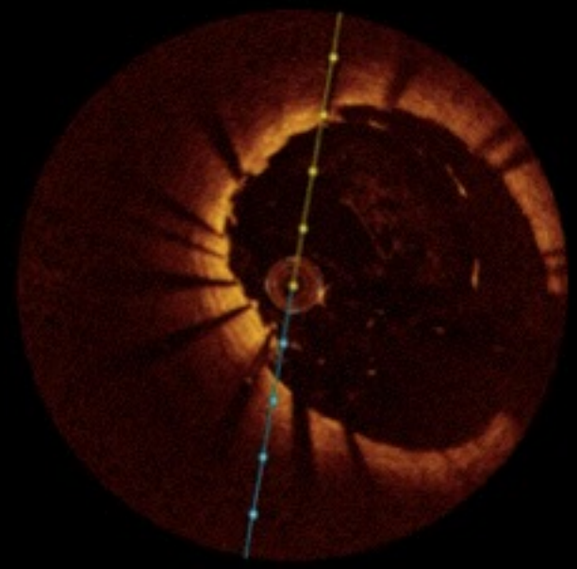


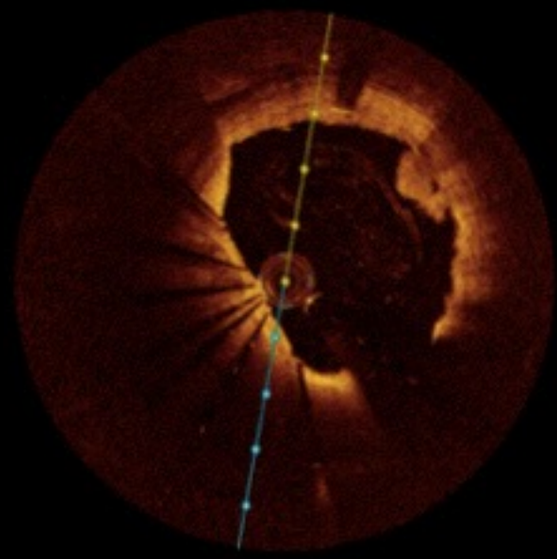
Initial



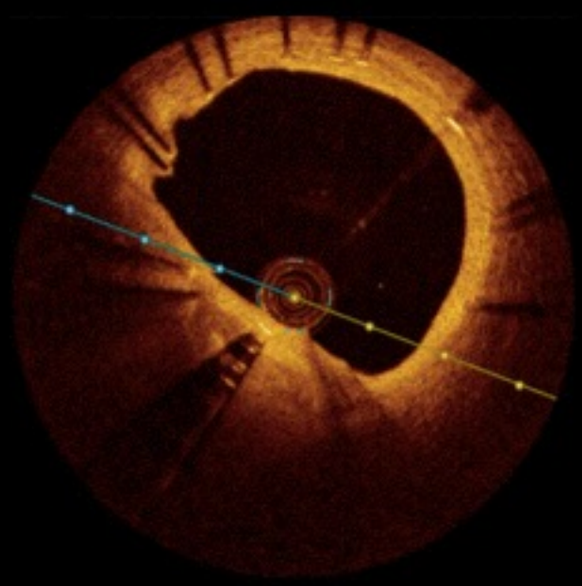


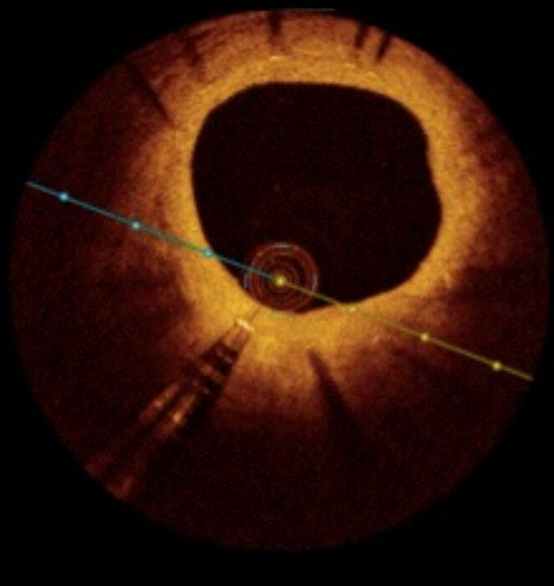
PS





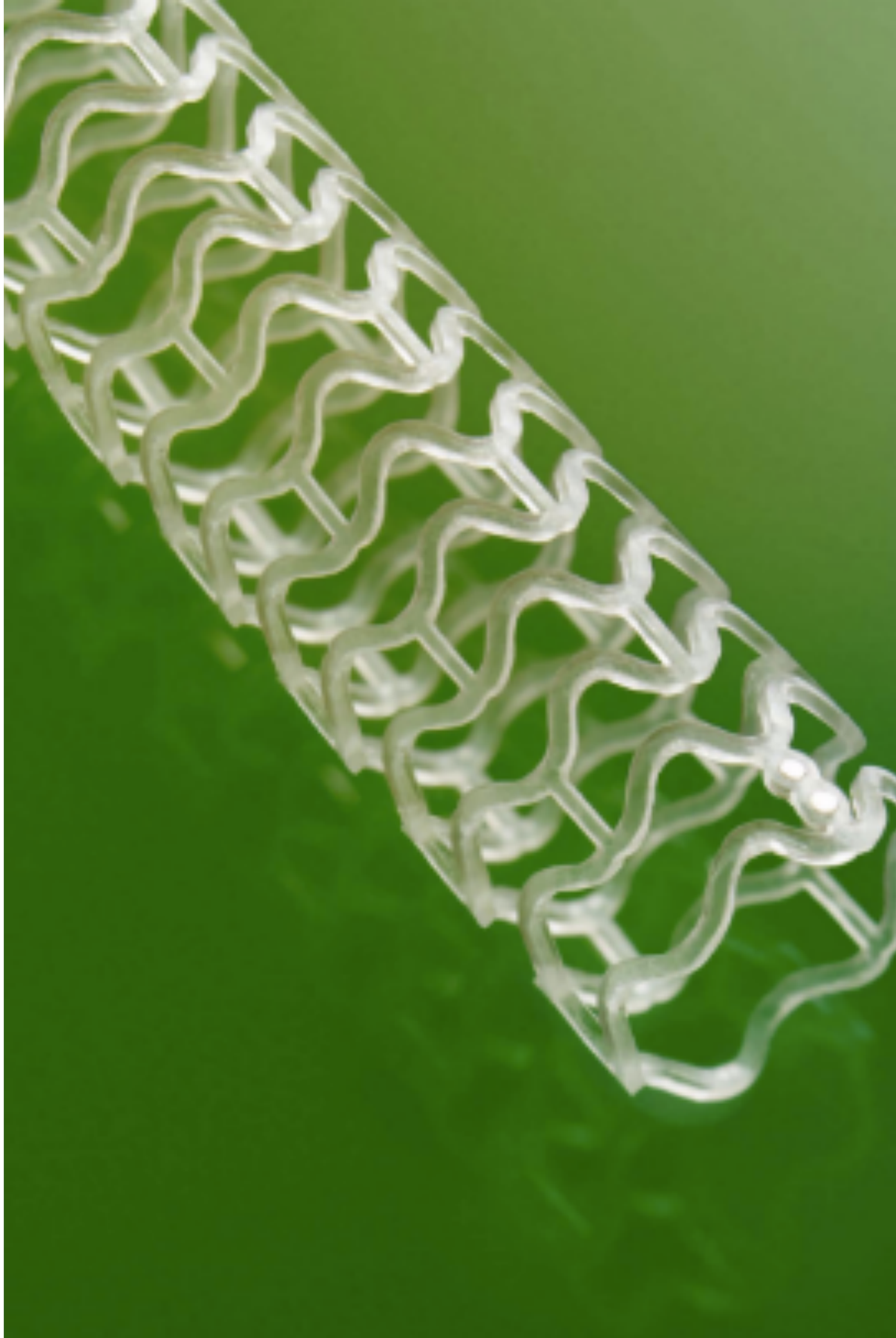
3Mo FU



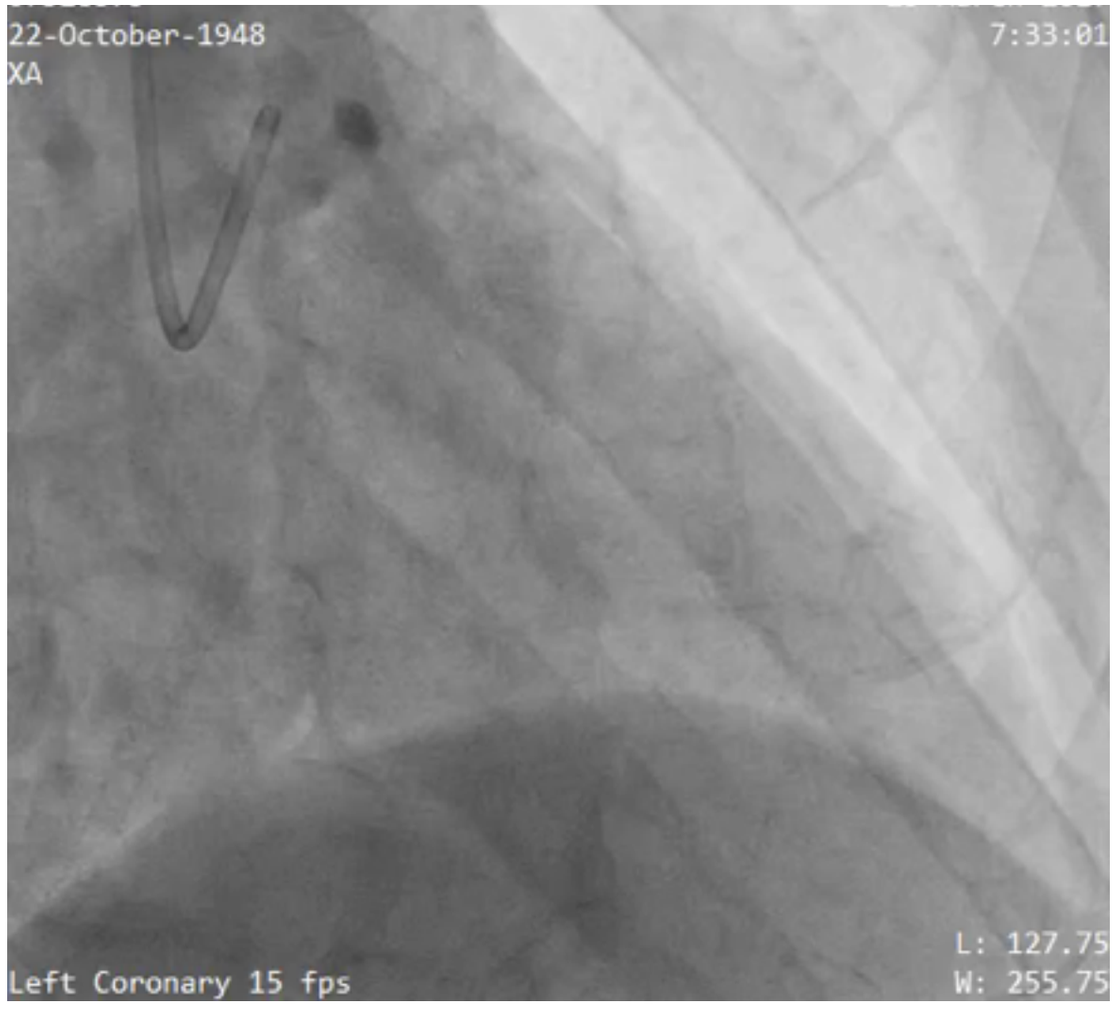


When I need OCT imaging

For BVS evaluation

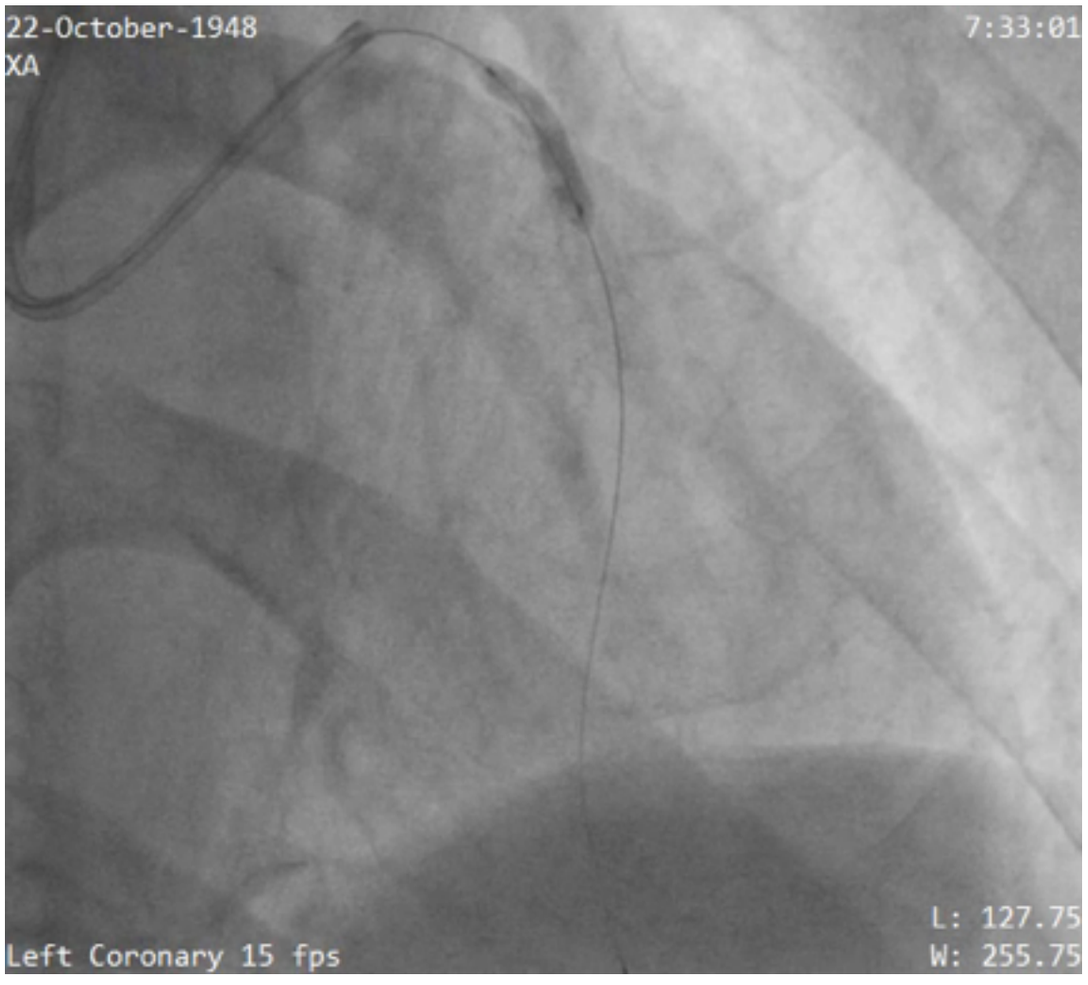


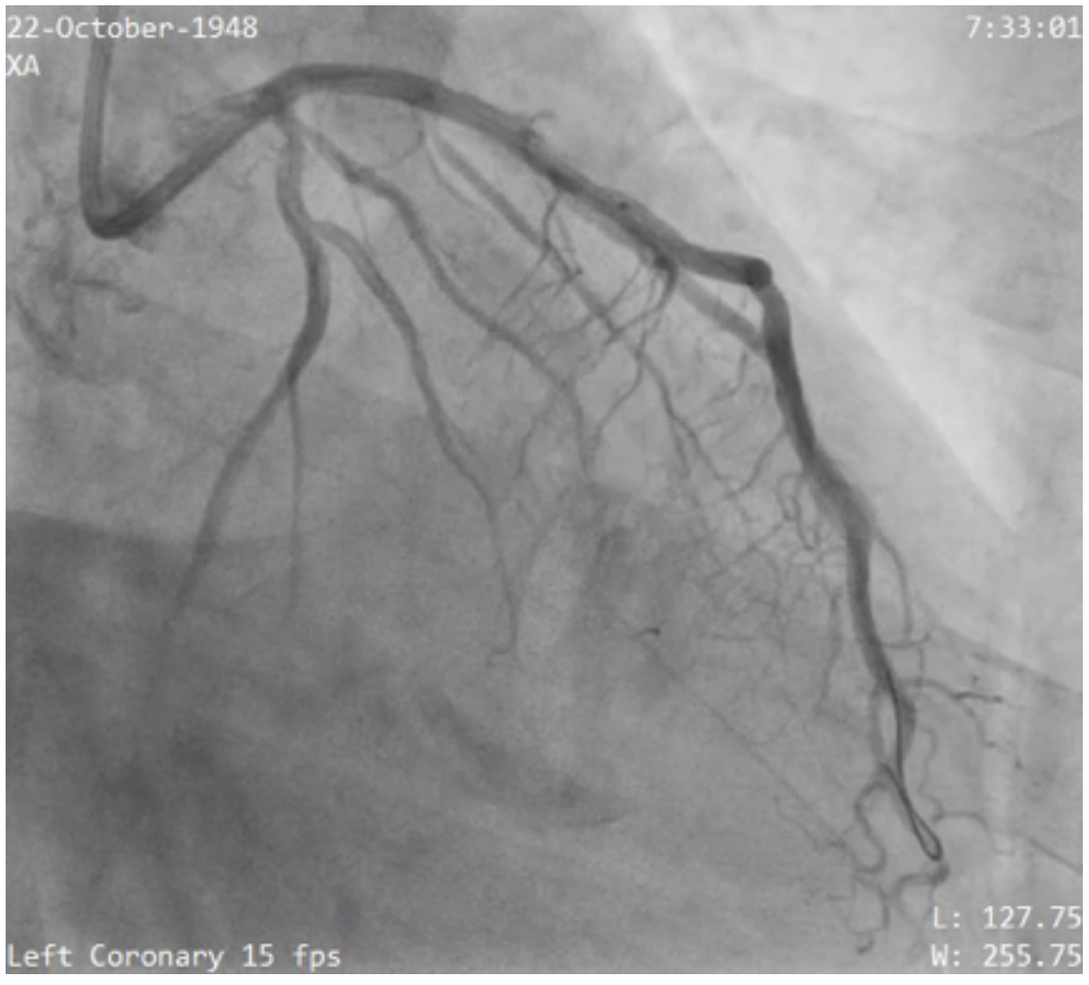
Case 5. 69 YO male NSTEMI, non-culprit lesion



Courtesy of WJ Jang

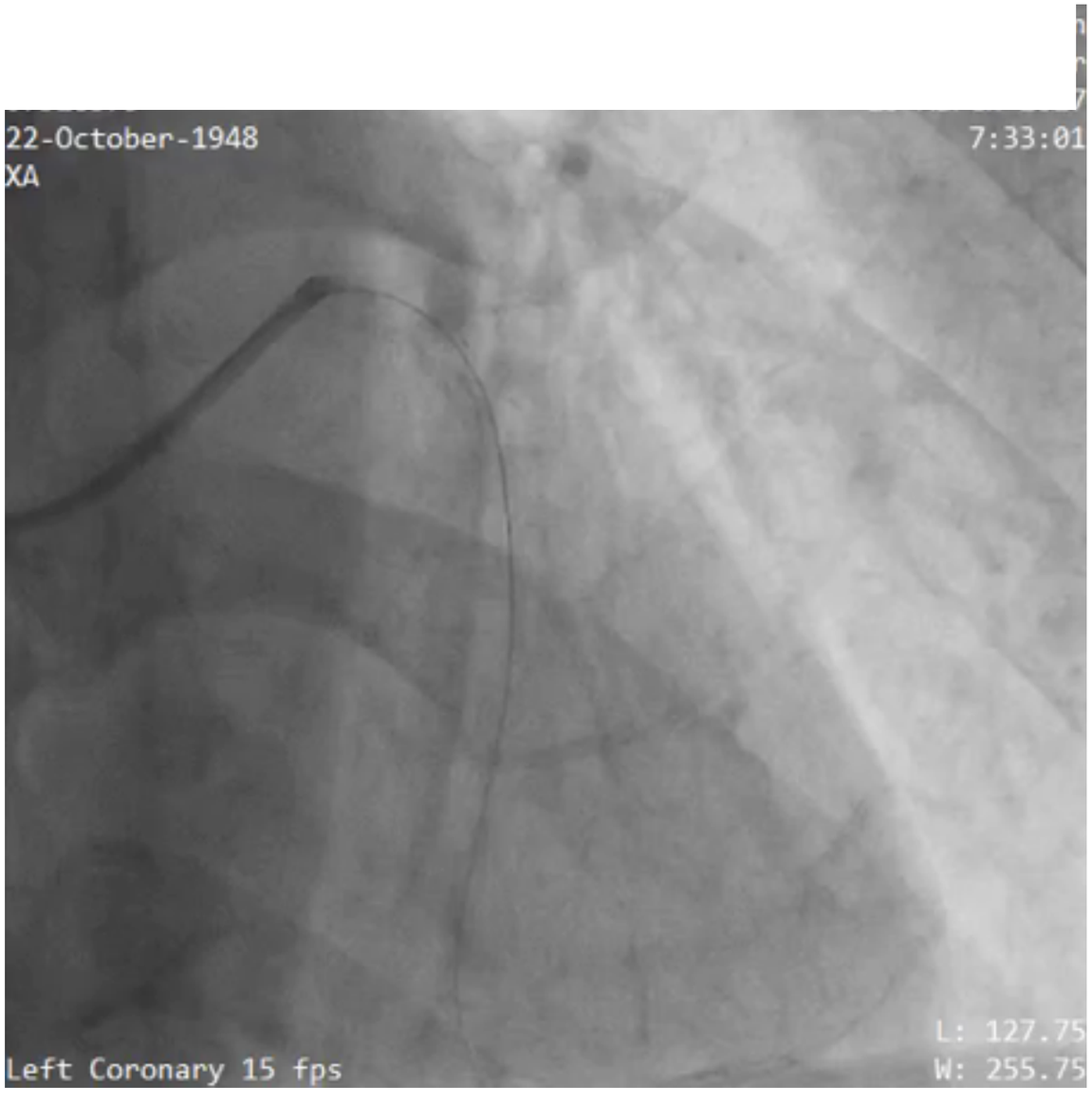
Case 5. 69 YO male NSTEMI, non-culprit lesion

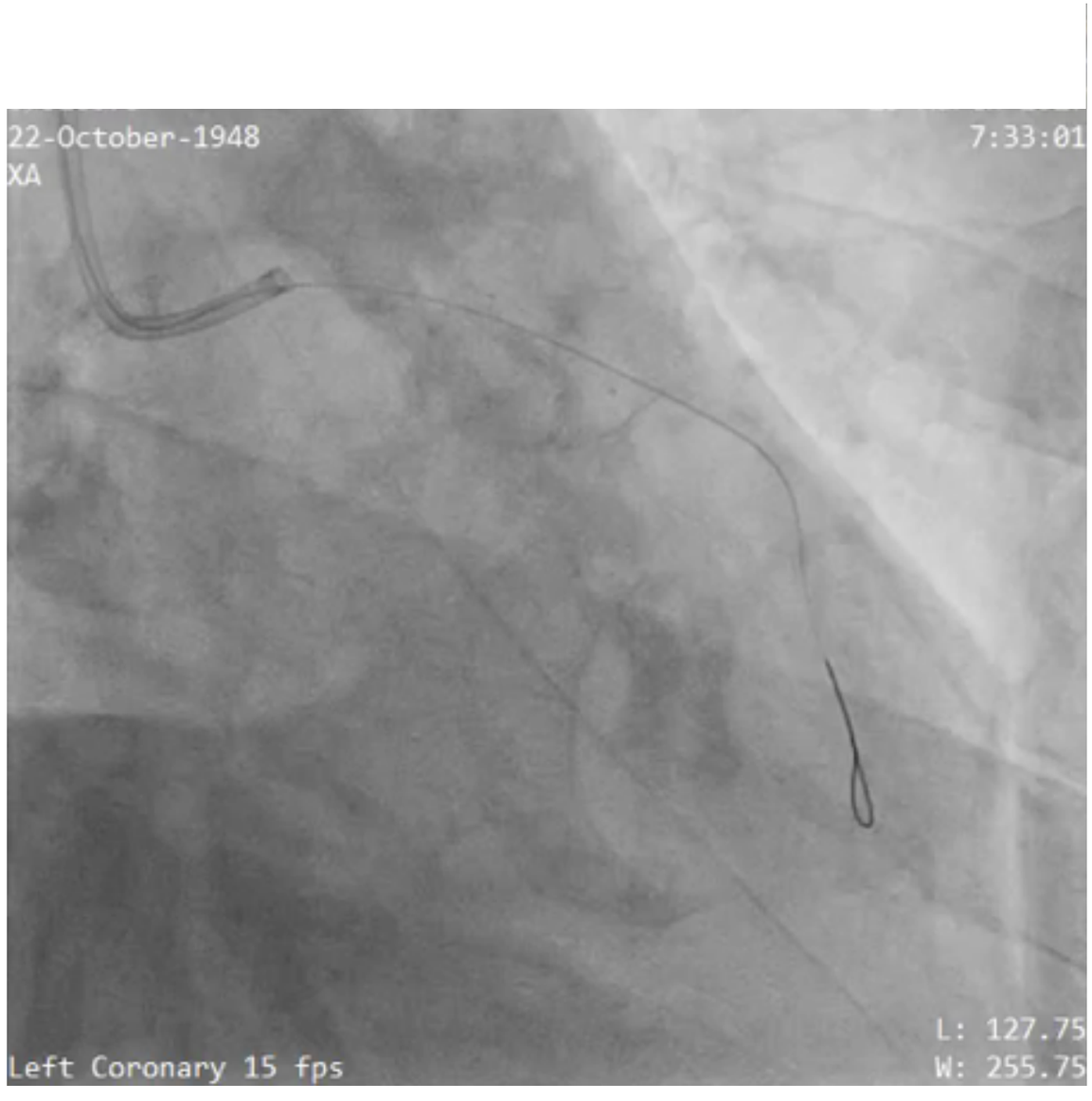




Absorb 3.5*23

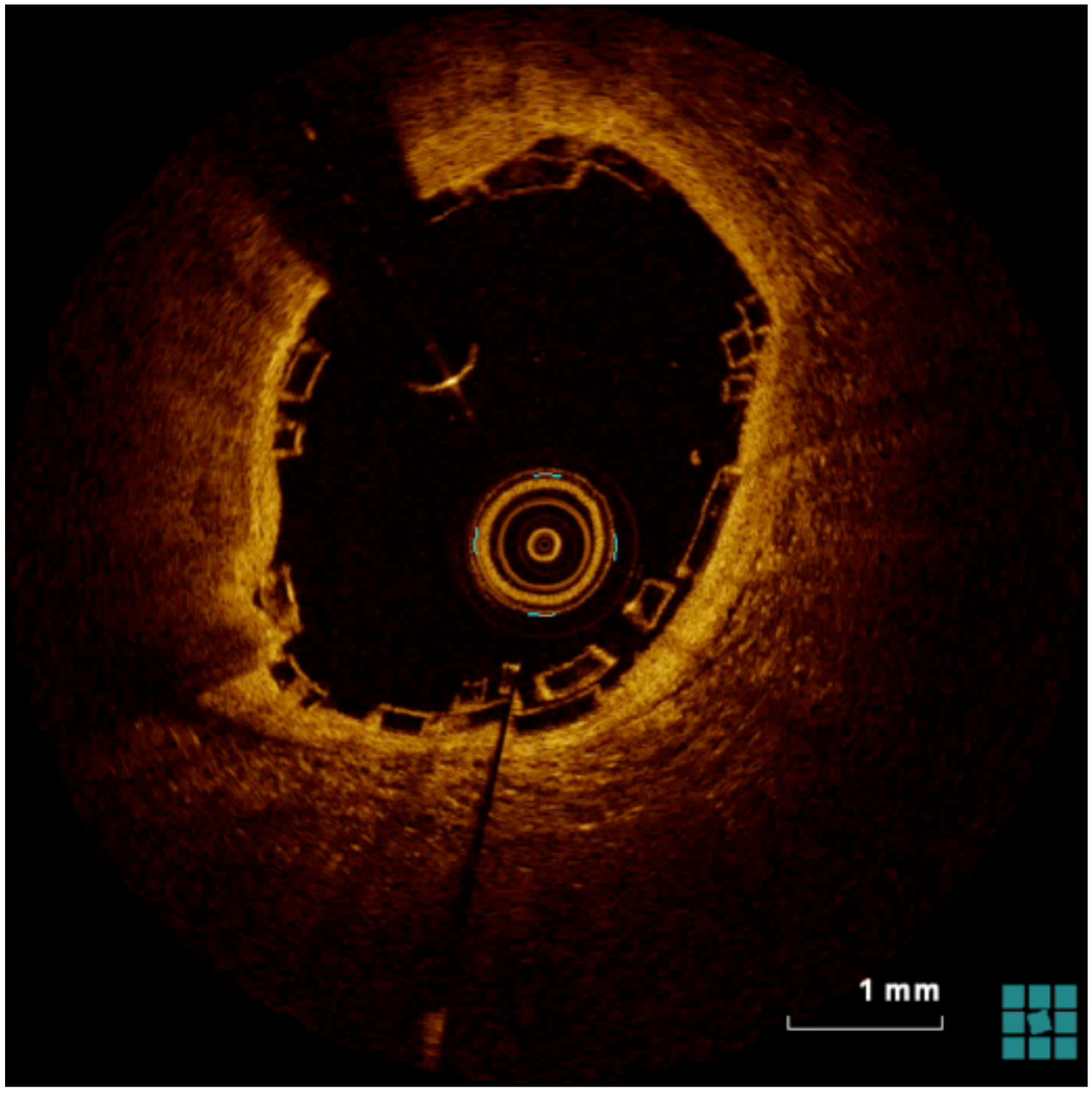
Case 5. 69 YO male NSTEMI, non-culprit lesion



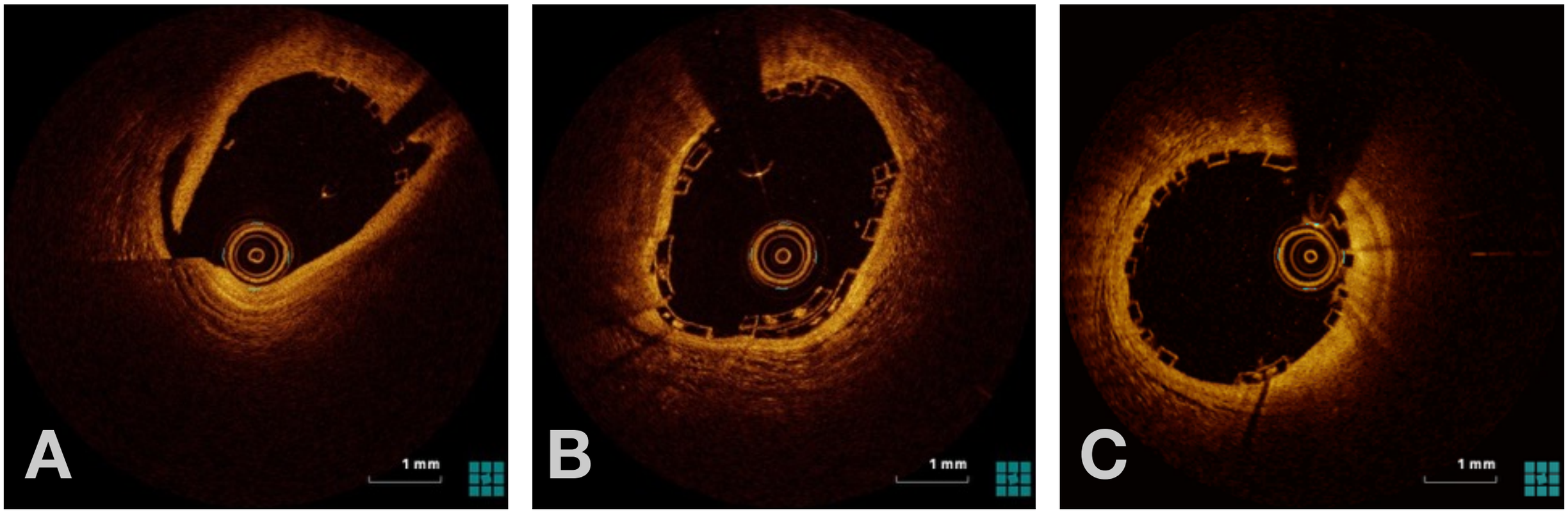


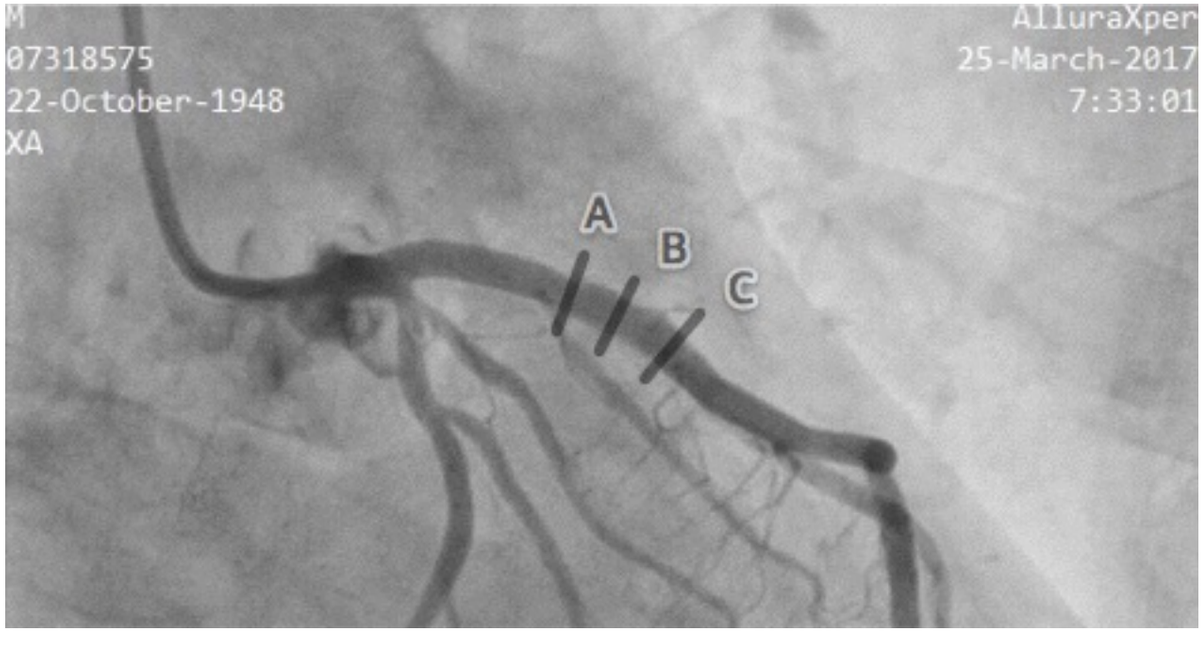
Absorb 3.5*23

Case 5. 65 YO male NSTEMI, non-culprit lesion



Case 5. 65 YO male NSTEMI, non-culprit lesion





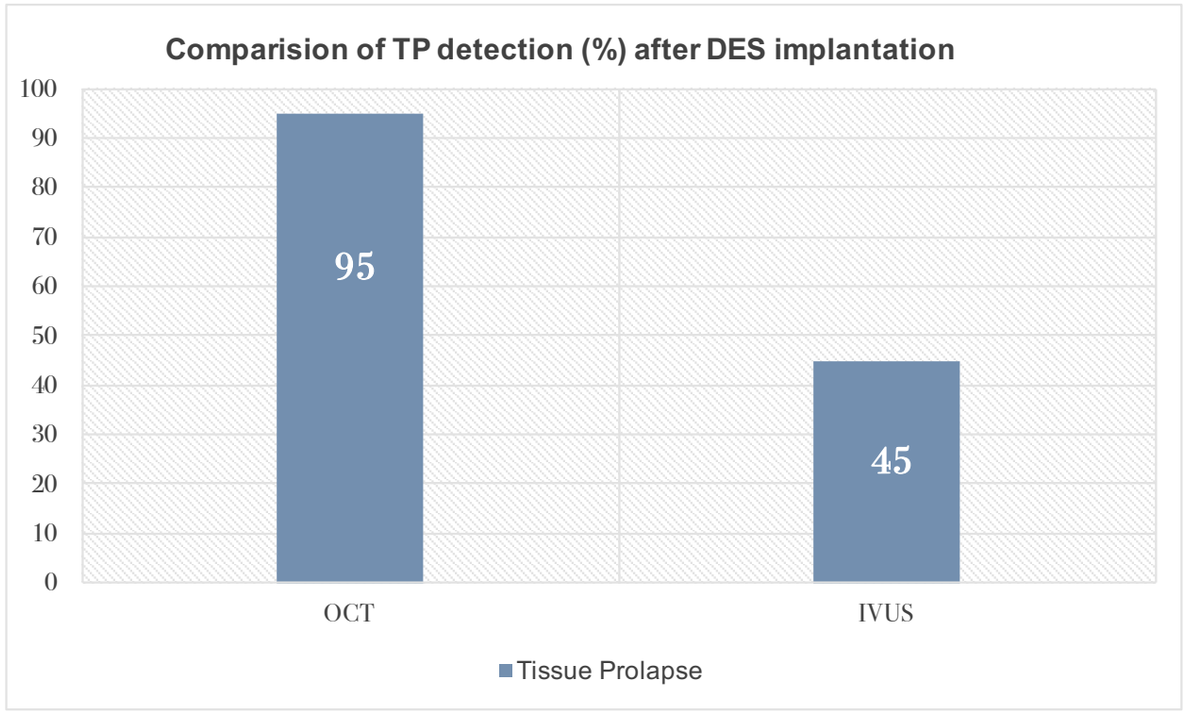
Make The Invisible to Visible…

When I need OCT imaging

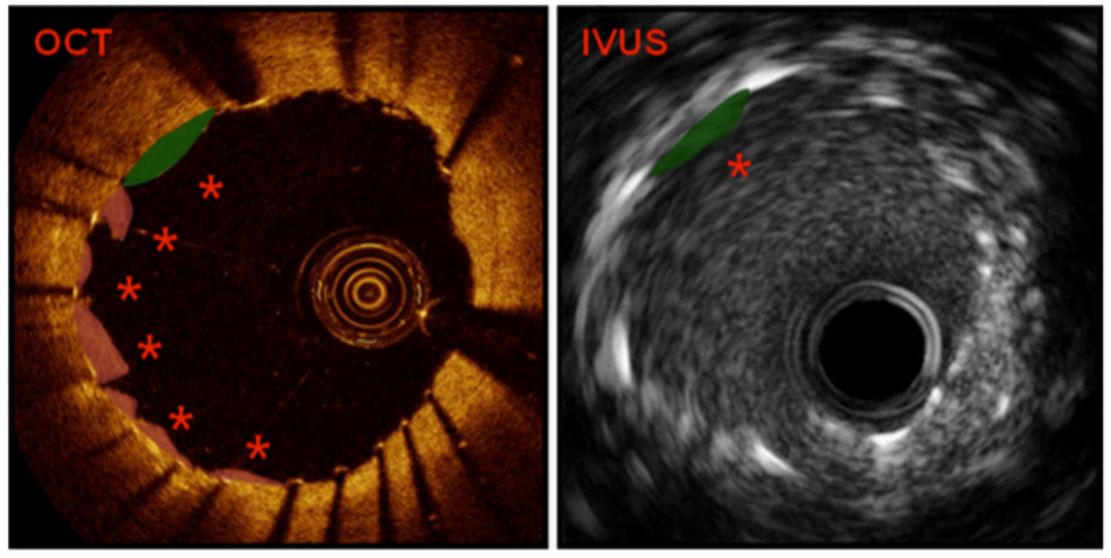
Intrastent thrombotic prolapse

Role of OCT in Thrombotic Protrusion

- OCT shows higher detection rate of TP than IVUS.
- OCT allows accurate assessment of thrombus



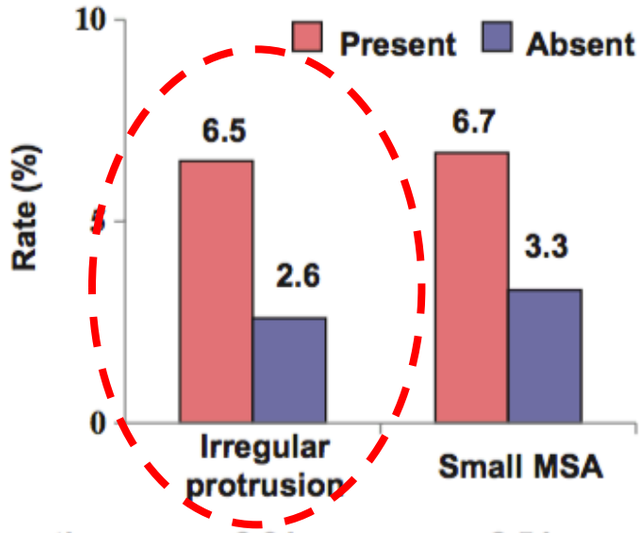
IVUS detected TP ≥ 0.17 mm²



JH Sohn, SH Hur, HJ Yoon, et al
Int J Cardiovasc Imaging (2015) 31:21–29

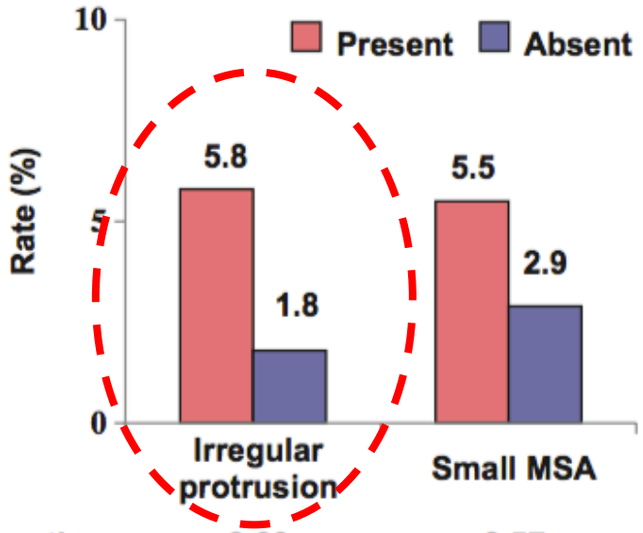
Clinical relervance of Abnormal TP

A **Device-oriented clinical endpoint**

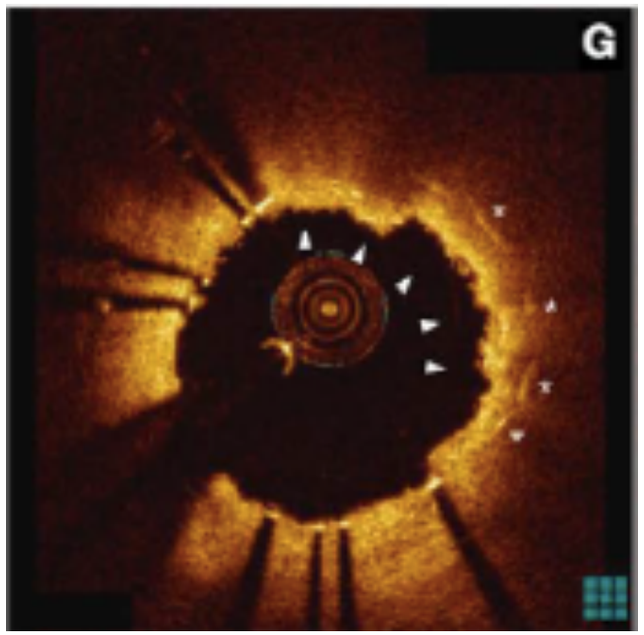


	Irregular protrusion	Small MSA
Odds ratio (95%CI)	2.64 (1.40 – 5.01)	2.54 (1.23 – 5.25)
P-value	0.003	0.012
Sensitivity, %	74.4	59.0
Specificity, %	47.7	59.6
PPV, %	6.5	6.7
NPV, %	97.4	96.7

B **Target lesion revascularization**



	Irregular protrusion	Small MSA
Odds ratio (95%CI)	2.66 (1.40 – 5.05)	2.57 (1.24 – 5.24)
P-value	0.003	0.011
Sensitivity, %	78.8	57.6
Specificity, %	47.7	59.4
PPV, %	5.8	5.5
NPV, %	98.2	97.1

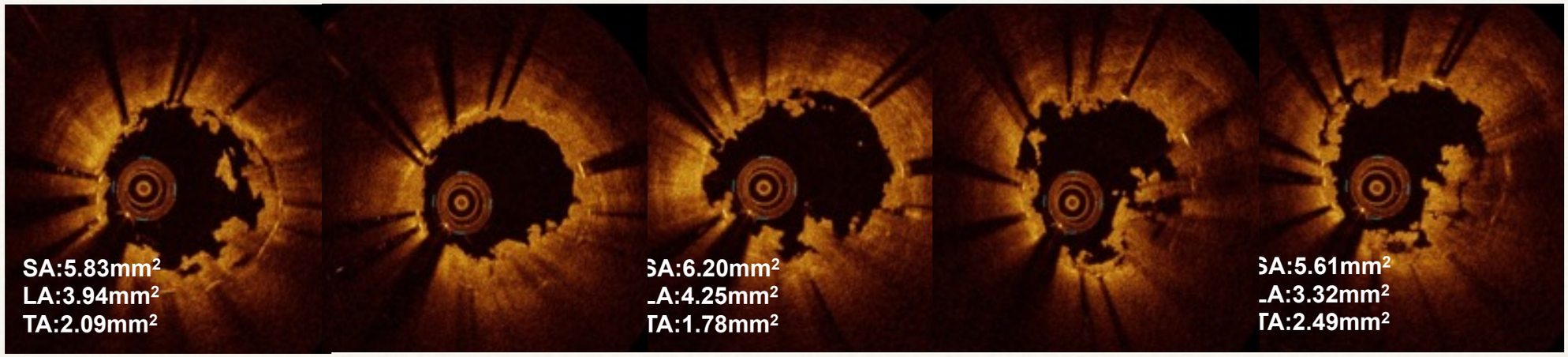


T Soeda, IK Jang et al.
Circulation (2015) 132:1020–29

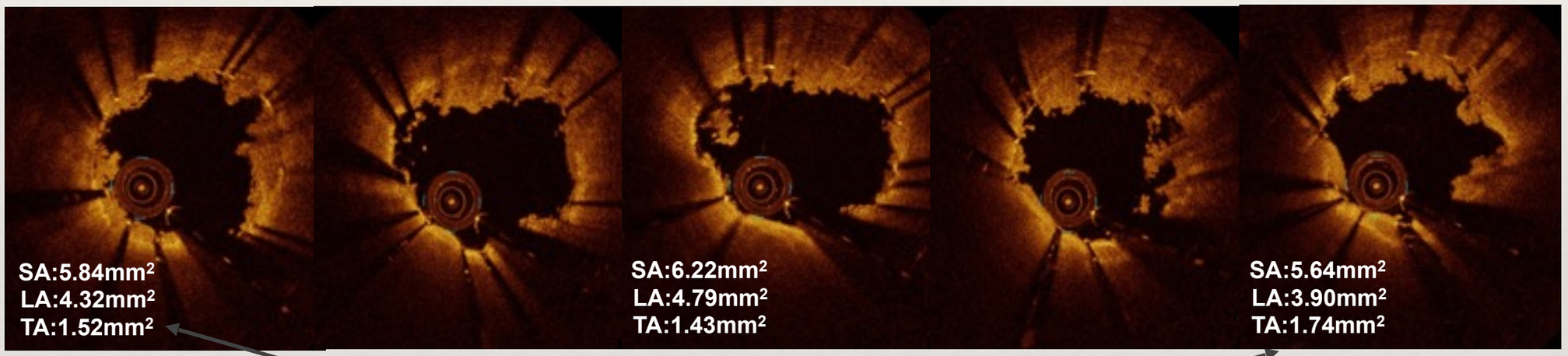
TAKE 5 study

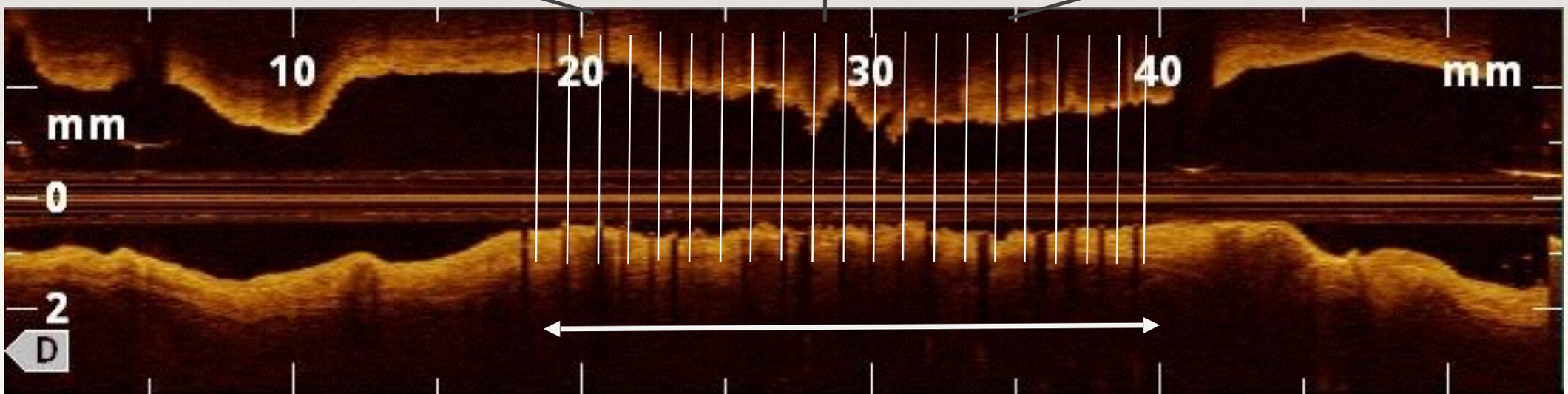
- Temporal change of intra-stent **T**hrombus Protrusion **A**mount of culprit lesion using Opti**K**al coh**E**rence Tomography within **5** minutes.
- Prospective, Pilot Study
  - **Institute**
    1. Keimyung University Dongsan Medical Center
    2. Pusan National University, Pusan Hospital.

5MIN After



POST STENT

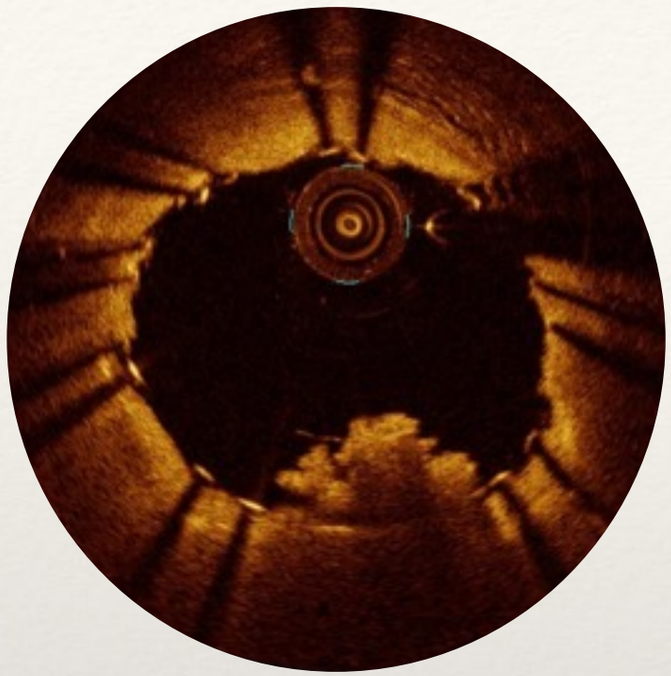


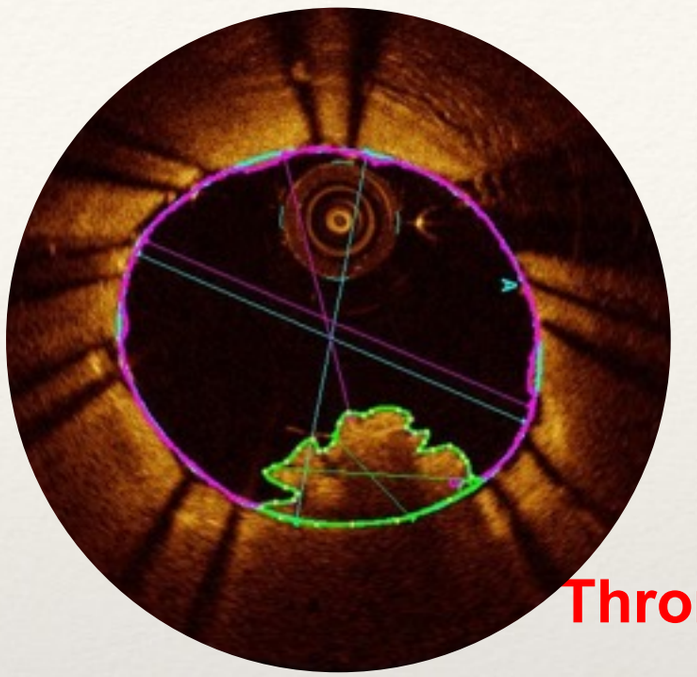


ΔMaxTA = -0.16mm²

SKS, 48YO Male, SA / LAD / Nobori

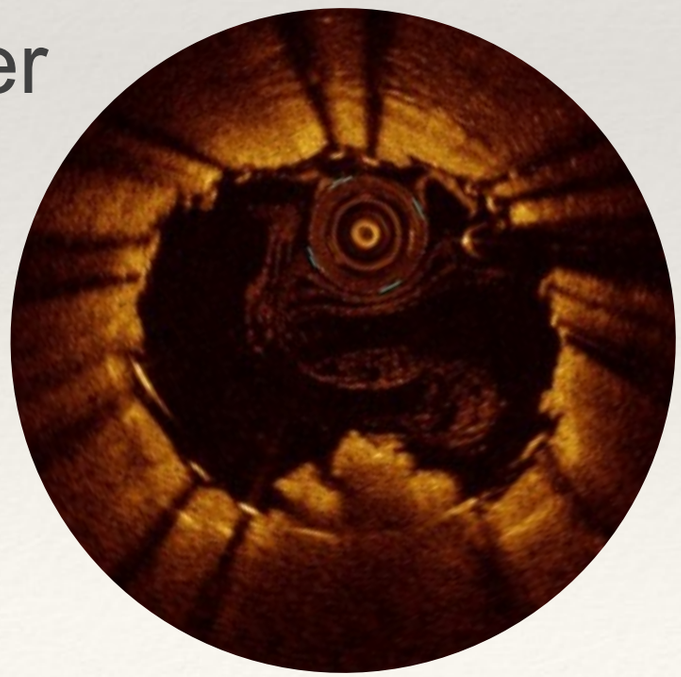
PS OCT

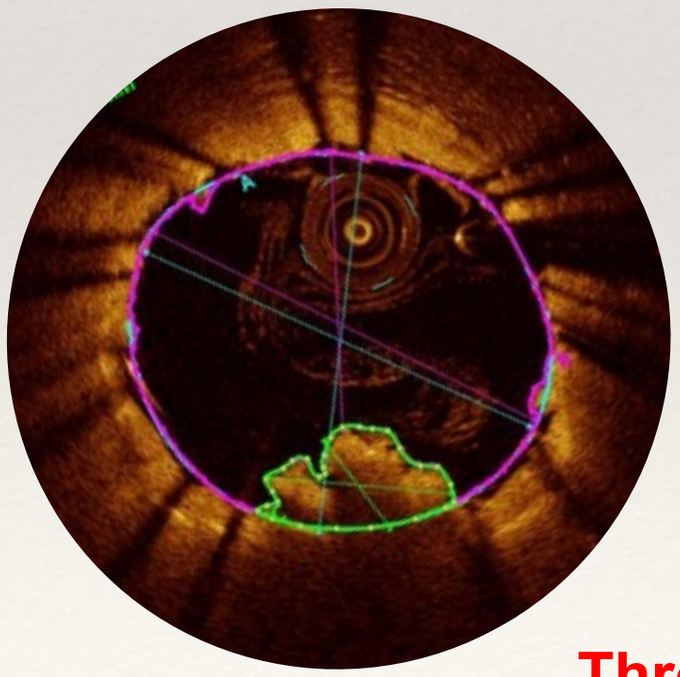




SA 7.47mm²
Min D. 2.89mm
Max D. 3.32mm
Thrombus Area 0.96mm²

5min Later



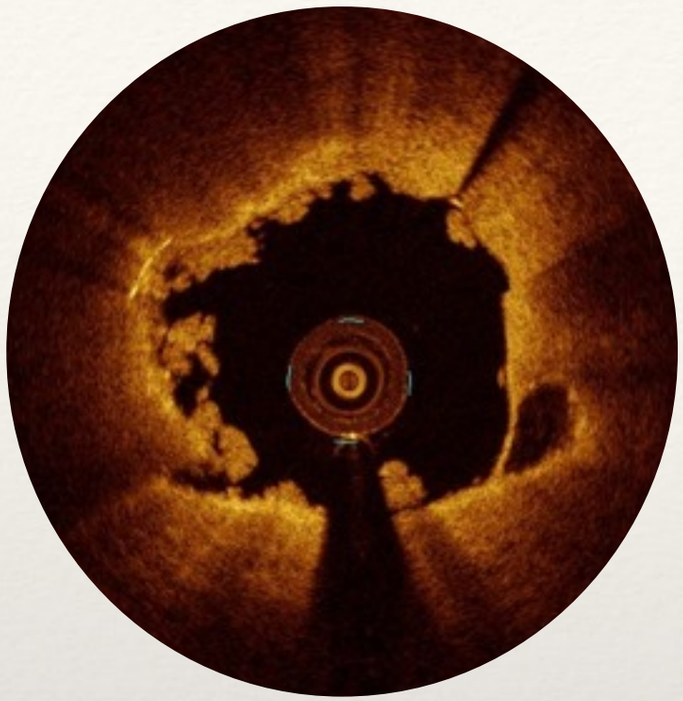


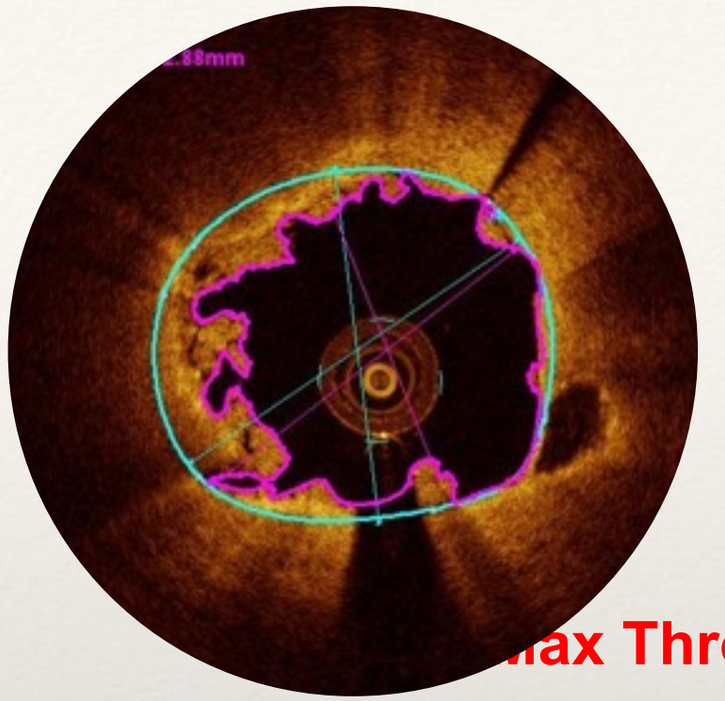
SA 7.46mm²
Min D. 2.92mm
Max D. 3.34mm
Thrombus Area 0.80mm²

ΔMaxTA = 0.97mm²

JCW 47YO Male, STEMI / LAD

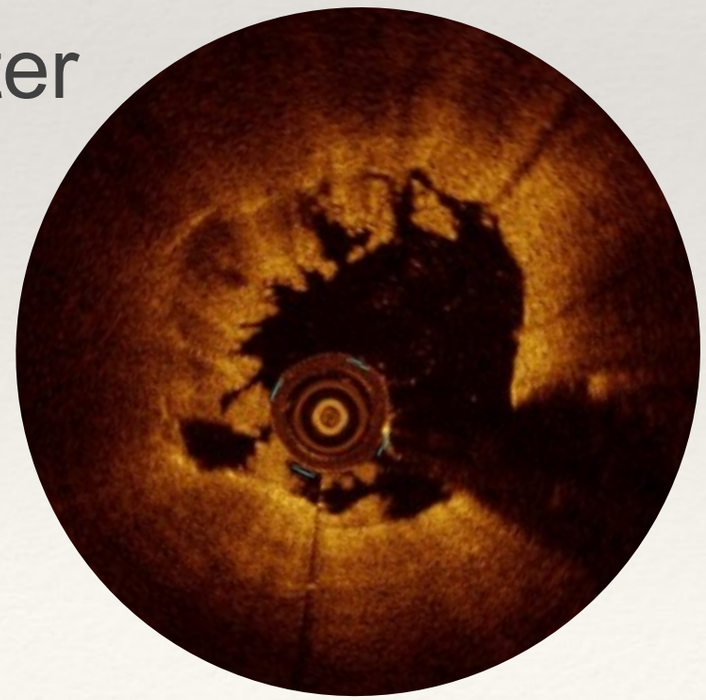
PS OCT

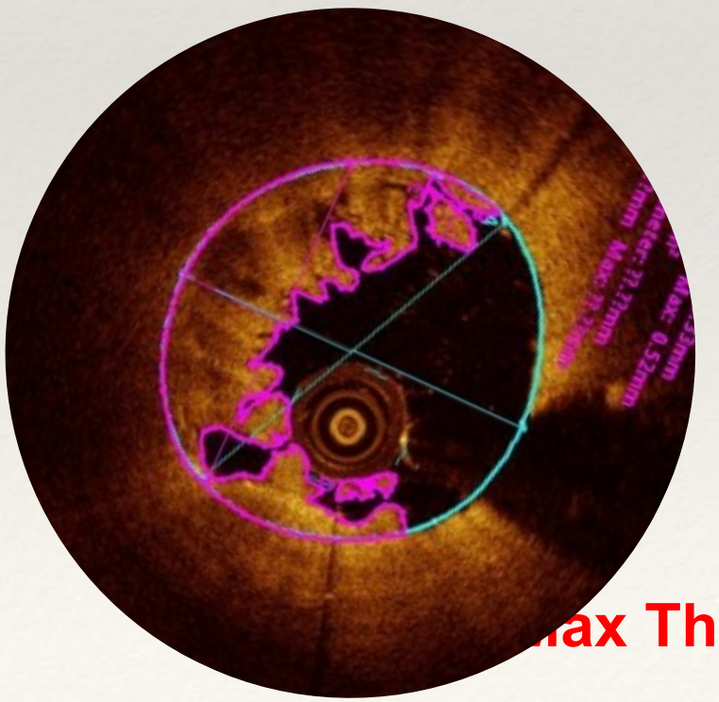




SA 6.47mm²
Min D. 2.61mm
Max D. 3.01mm
Max Thrombus Area 1.98mm²

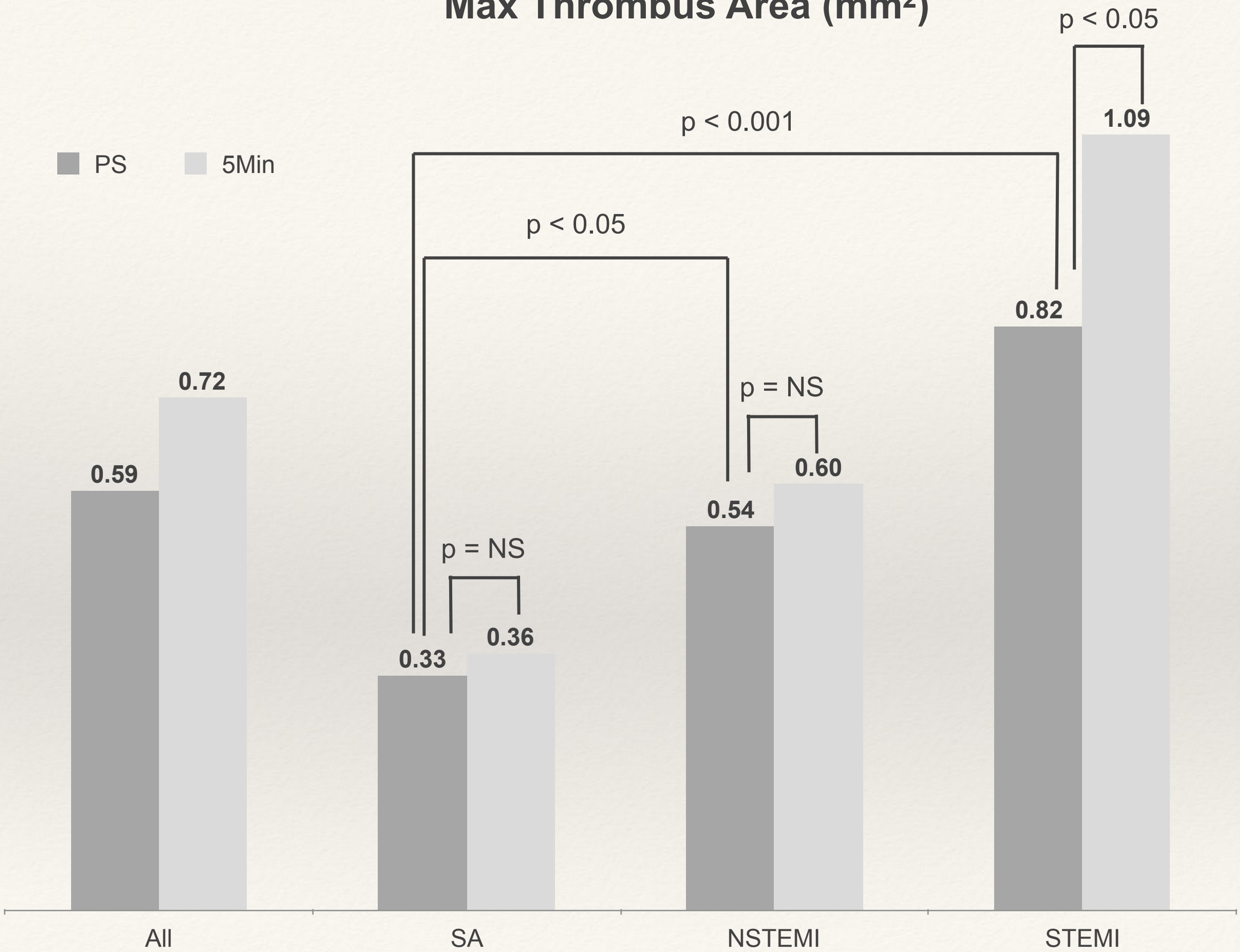
5min Later





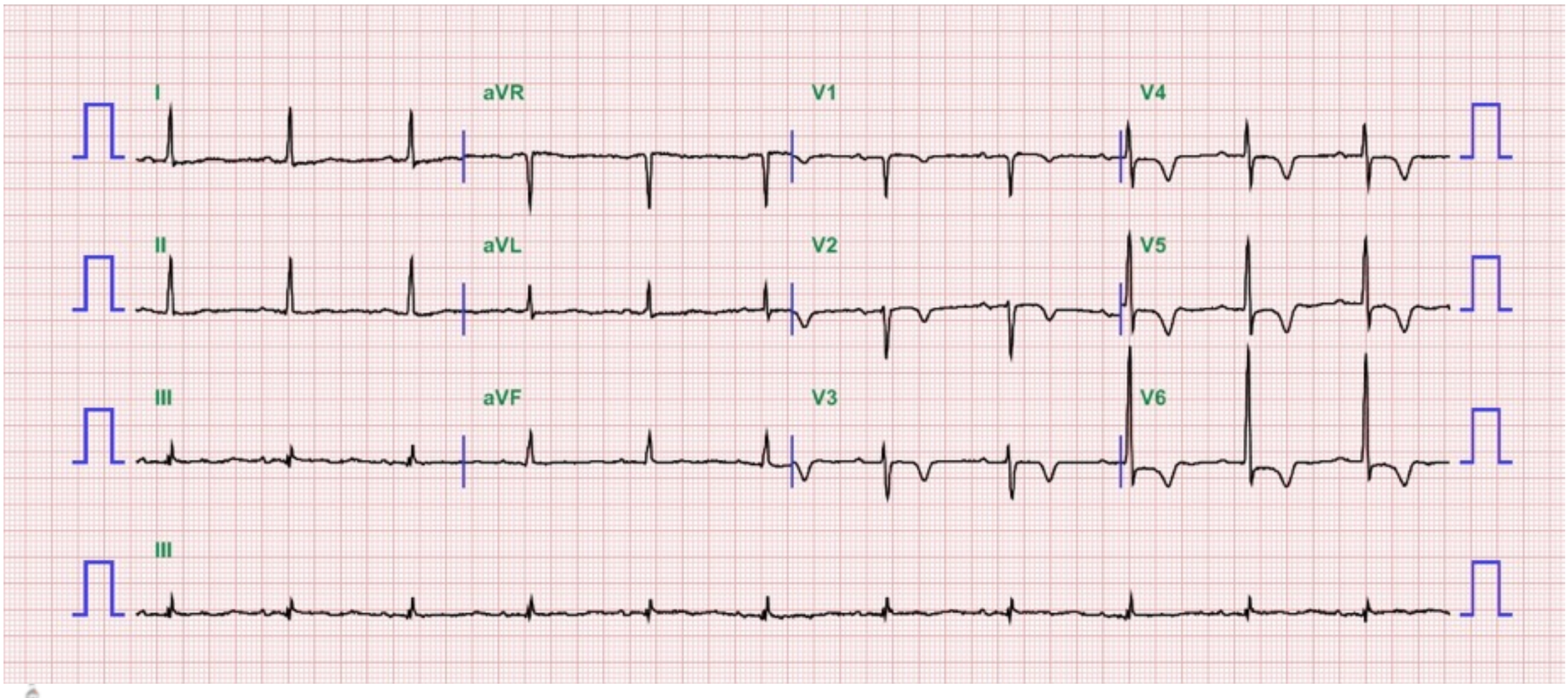
SA 6.46mm²
Min D. 2.78mm
Max D. 3.01mm
Max Thrombus Area 2.81mm²

Max Thrombus Area (mm^2)

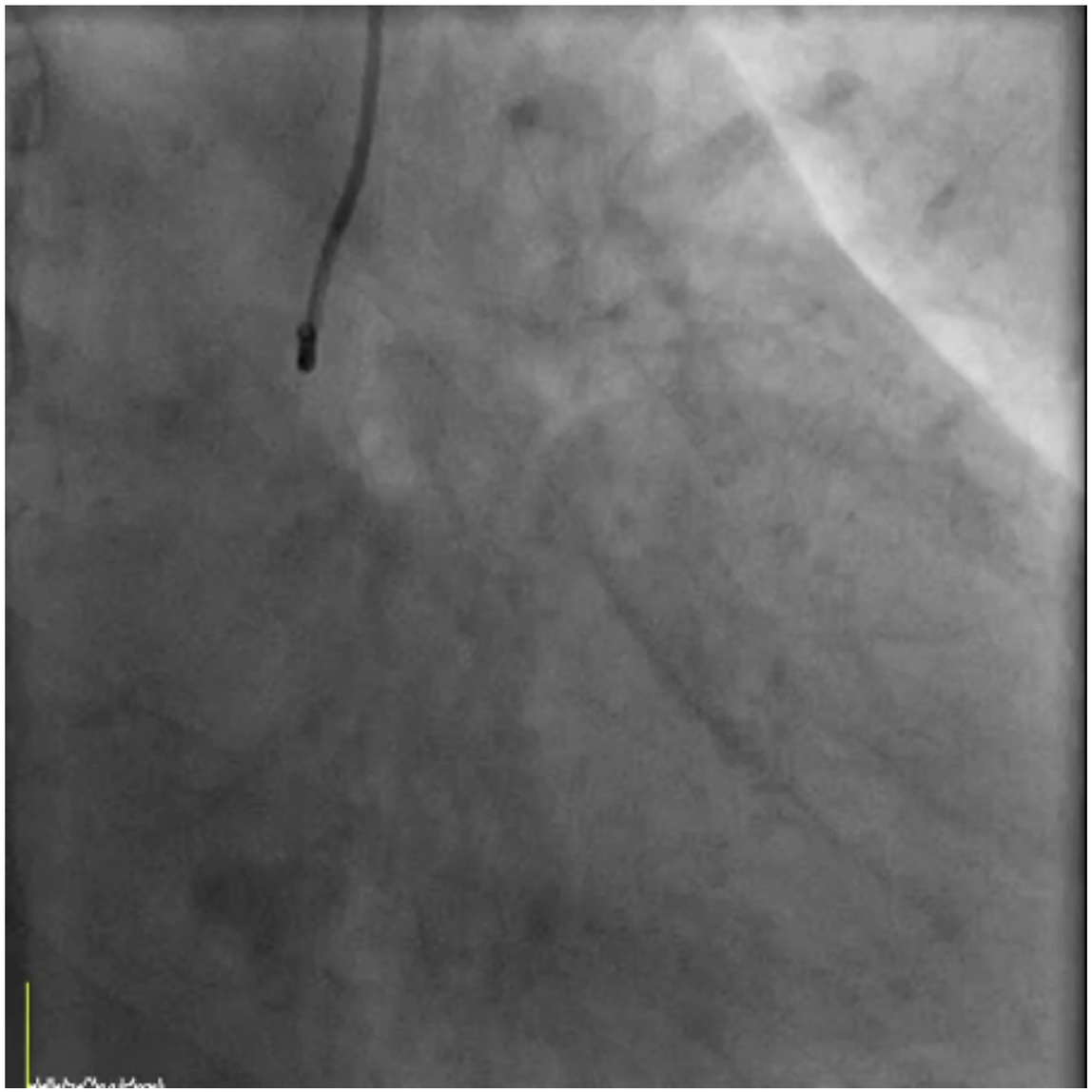


Case // 60 YO Female, UA

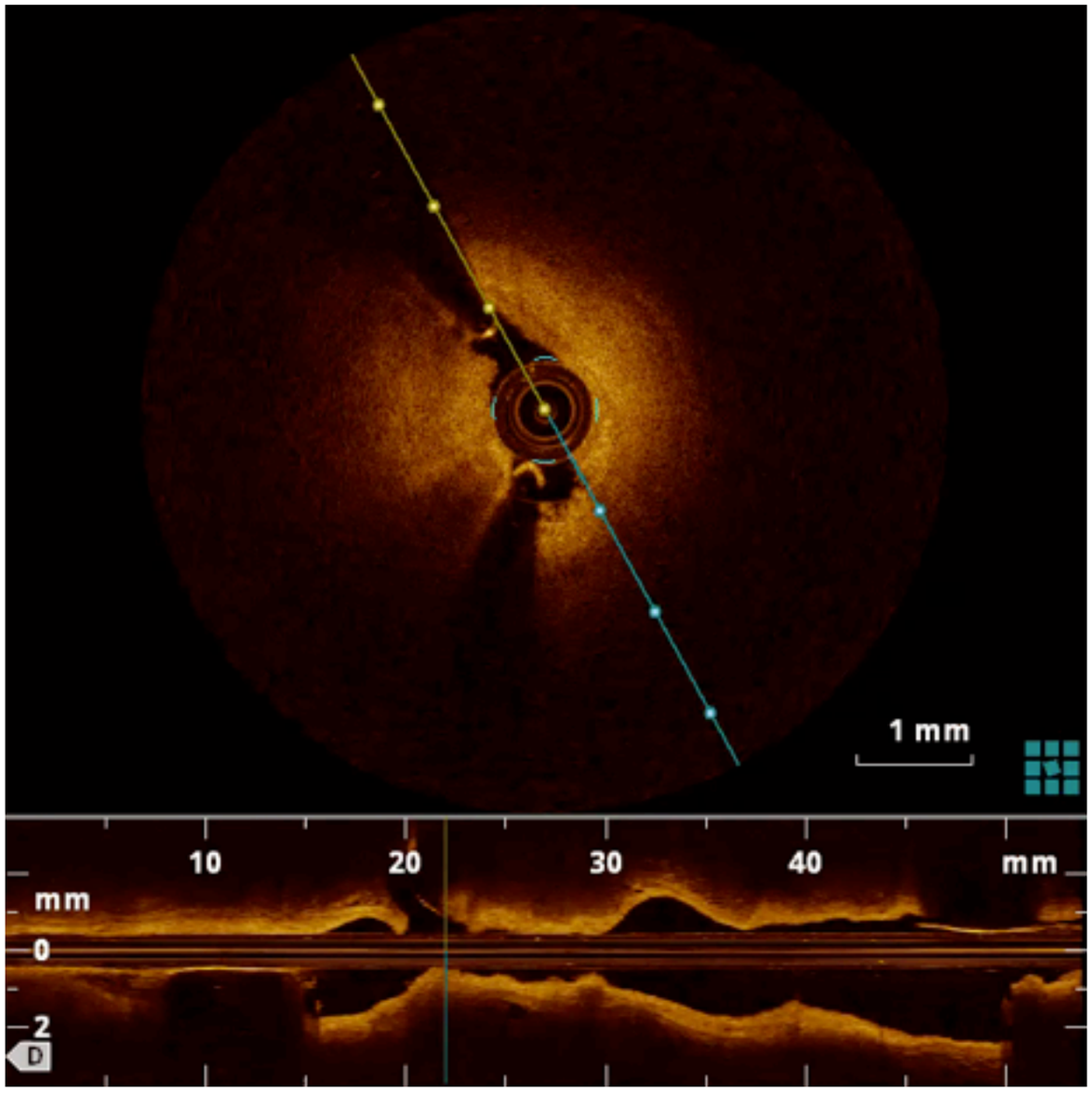
Resting onset chest pain



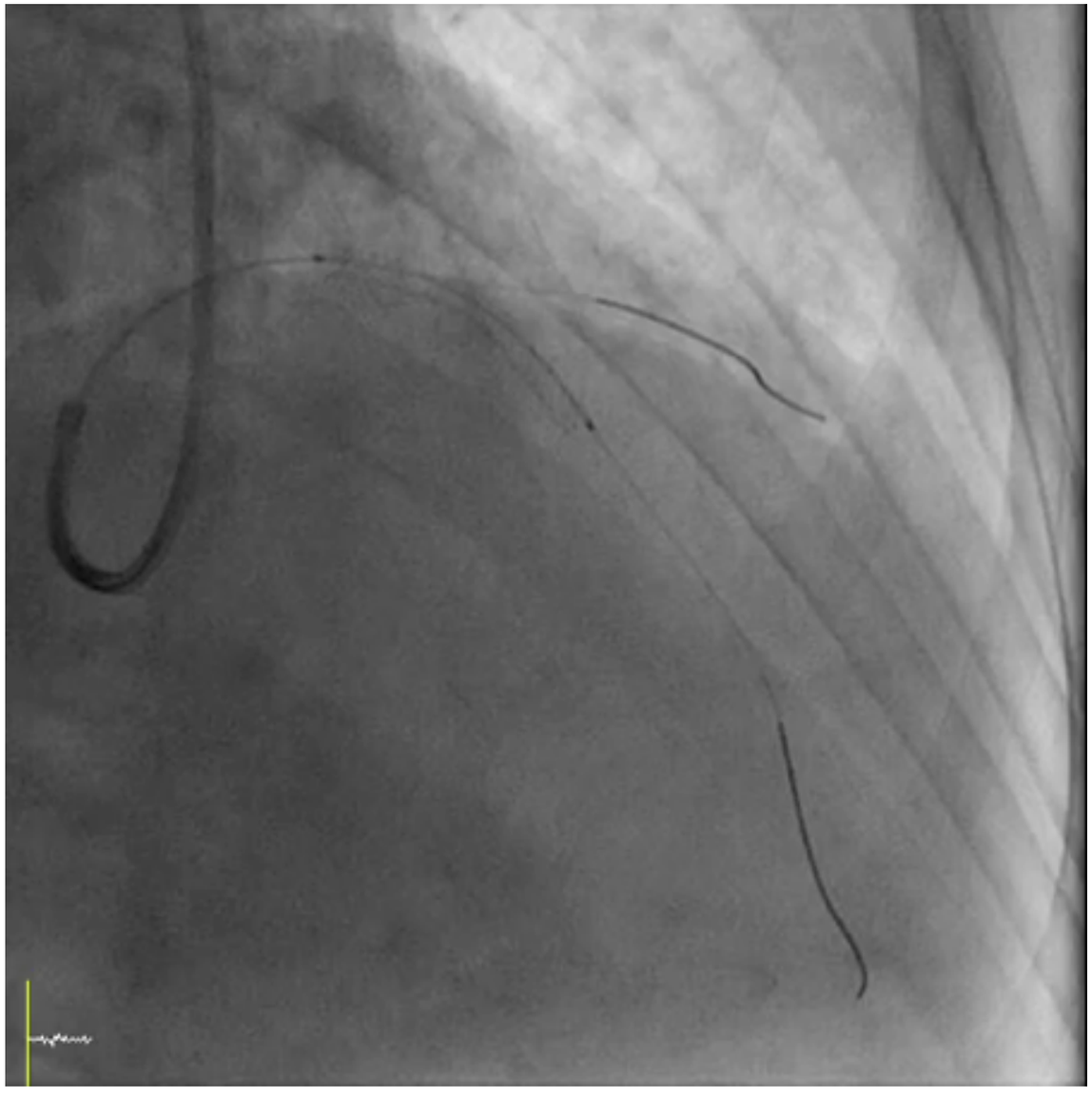
Case 6// 60 YO Female, UA



Case // 60 YO Female, UA

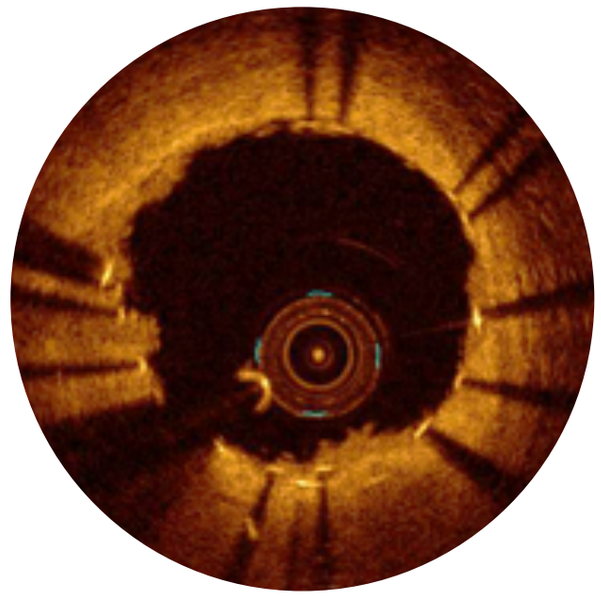


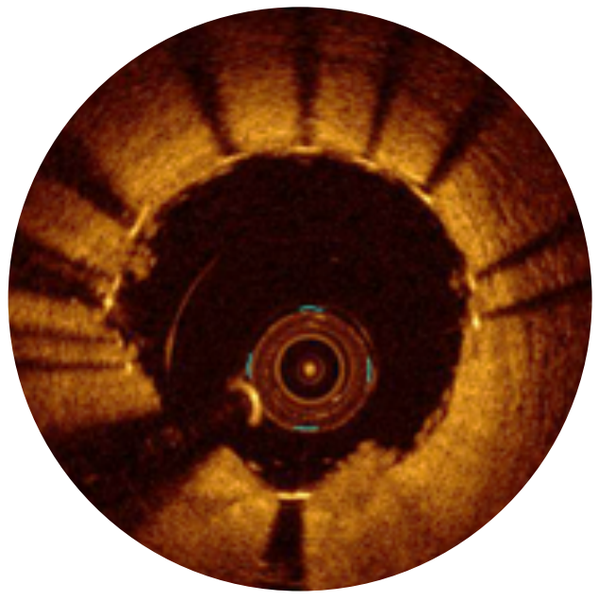
Case 6// 60 YO Female, UA

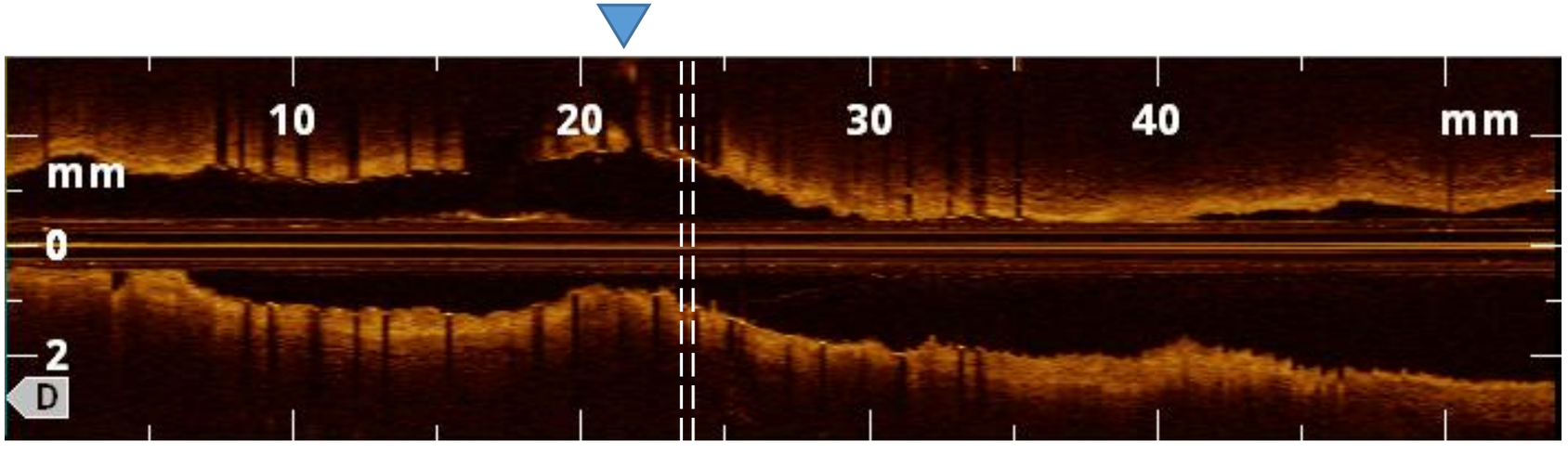


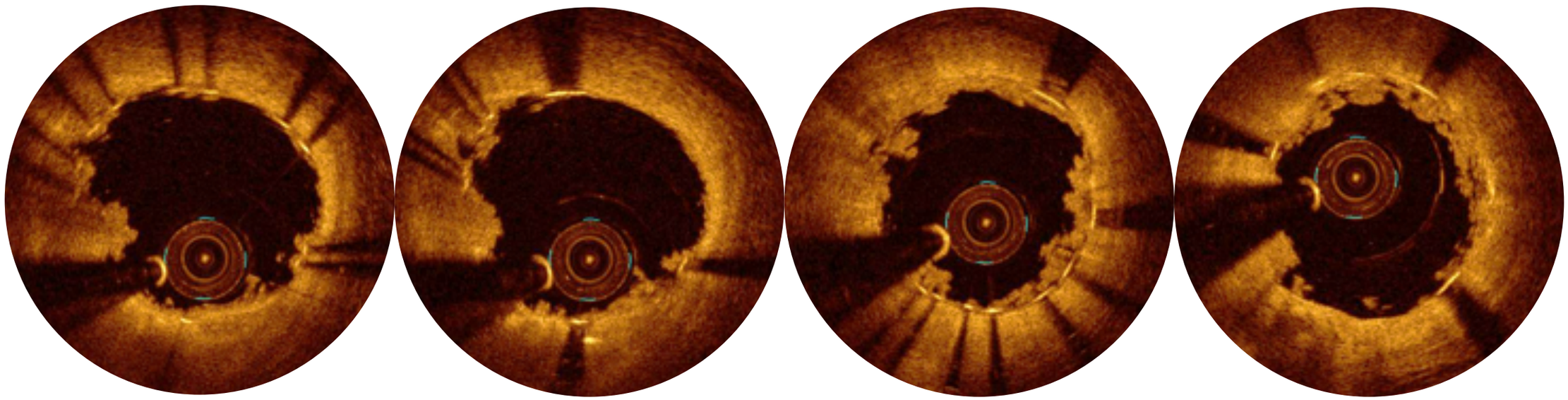
Ultimaster 2.75*28

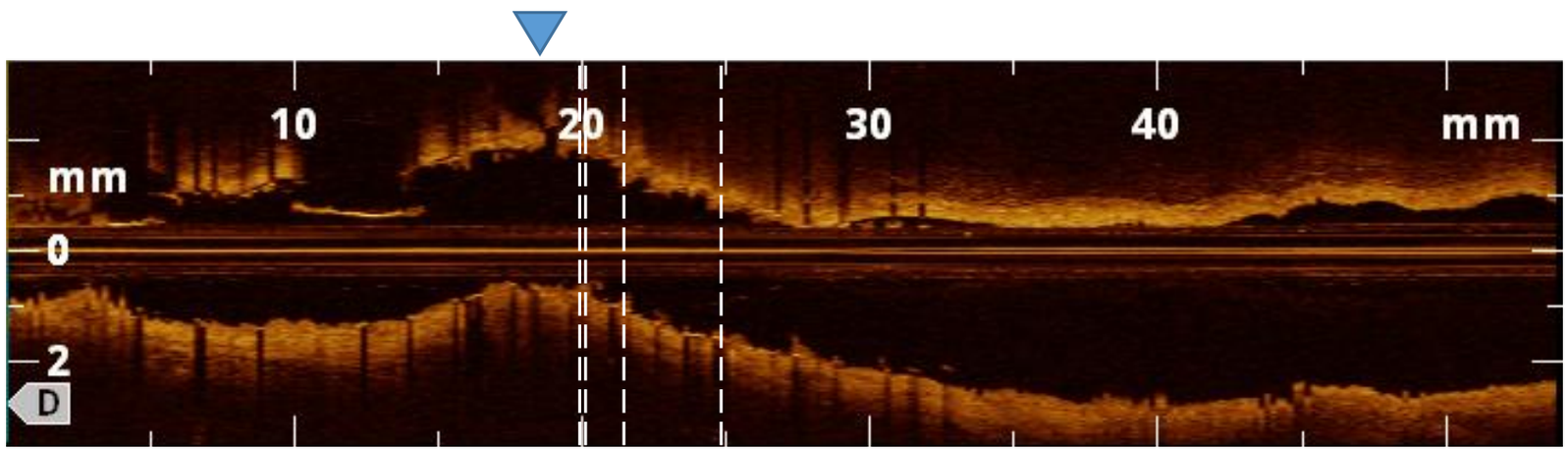
Case // 60 YO Female, UA



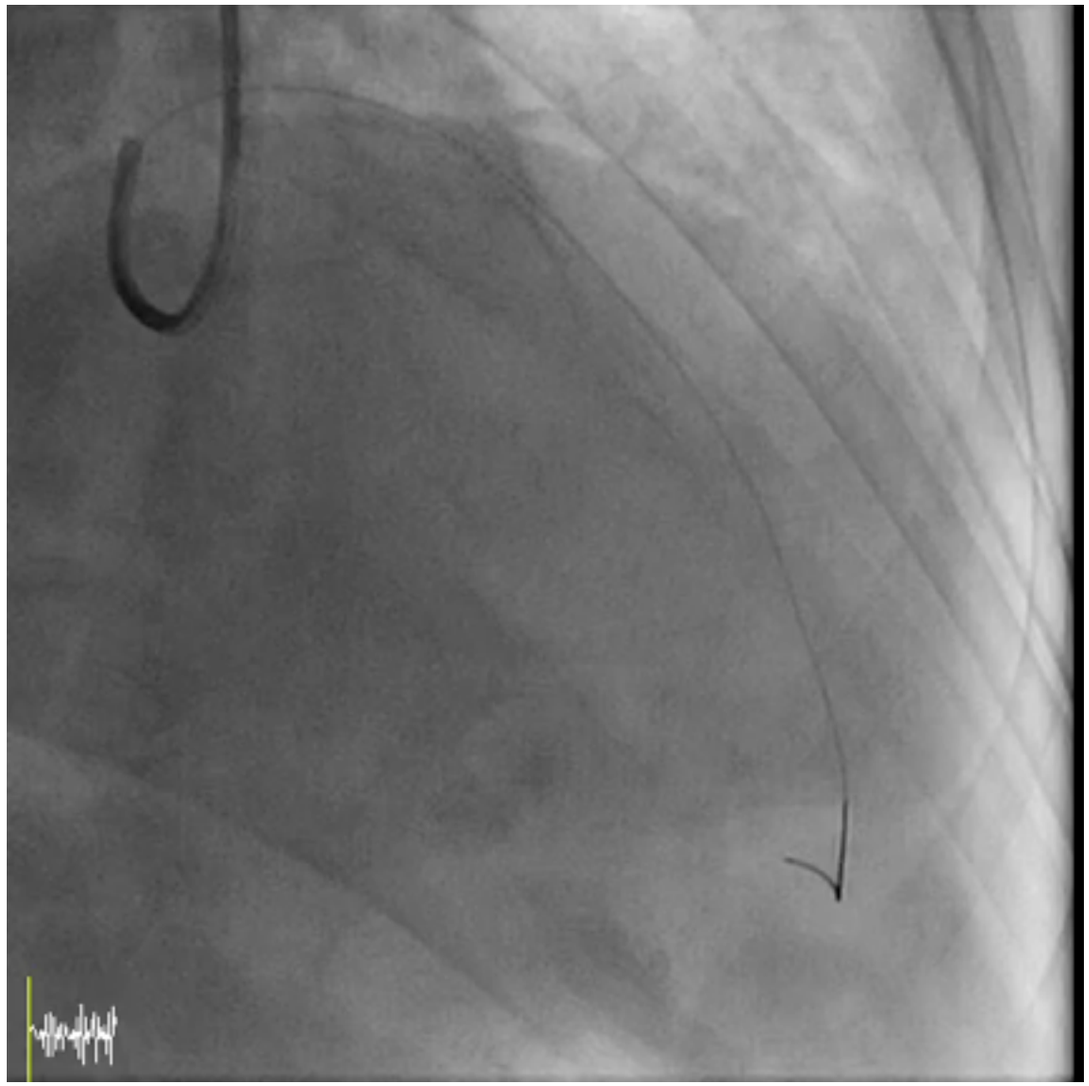


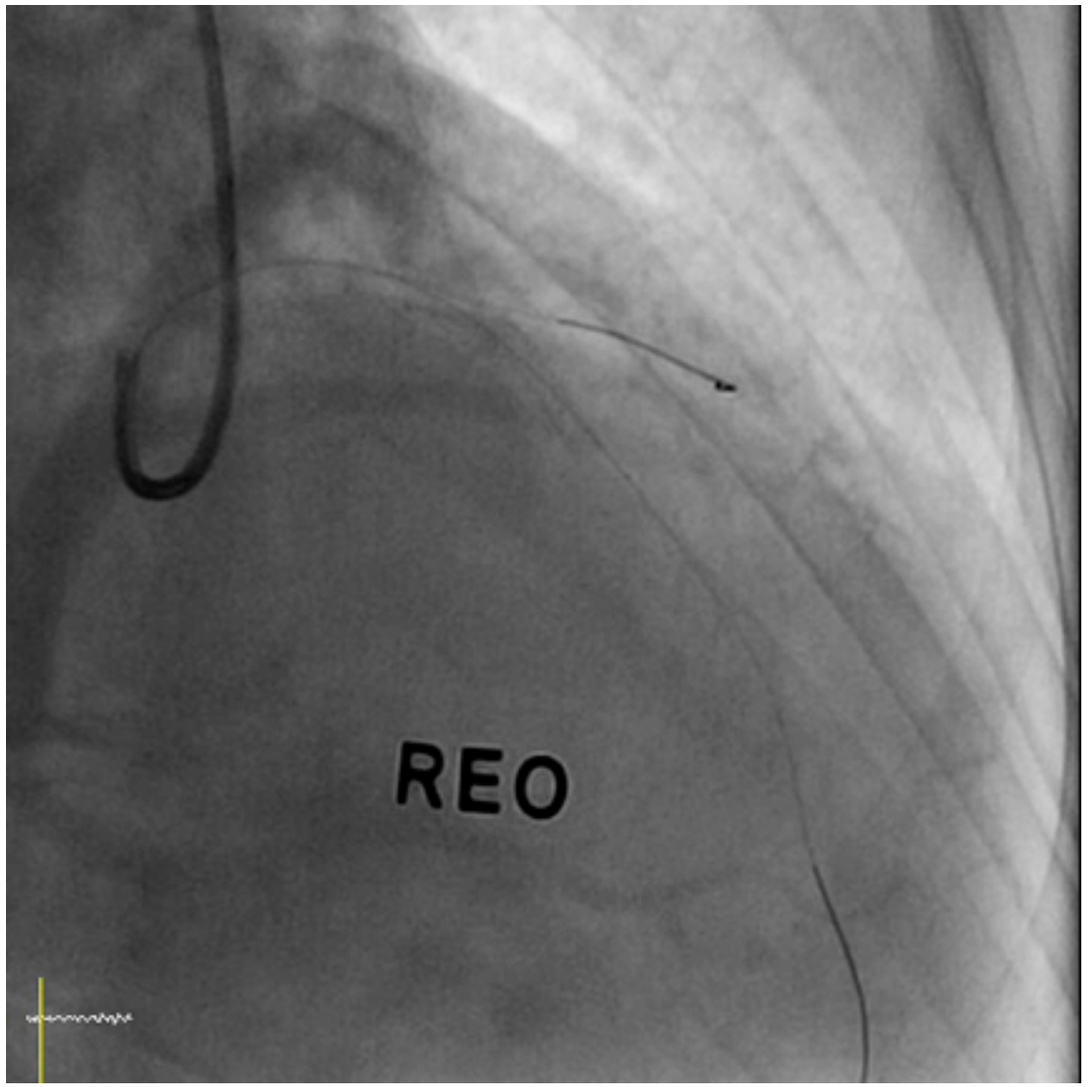




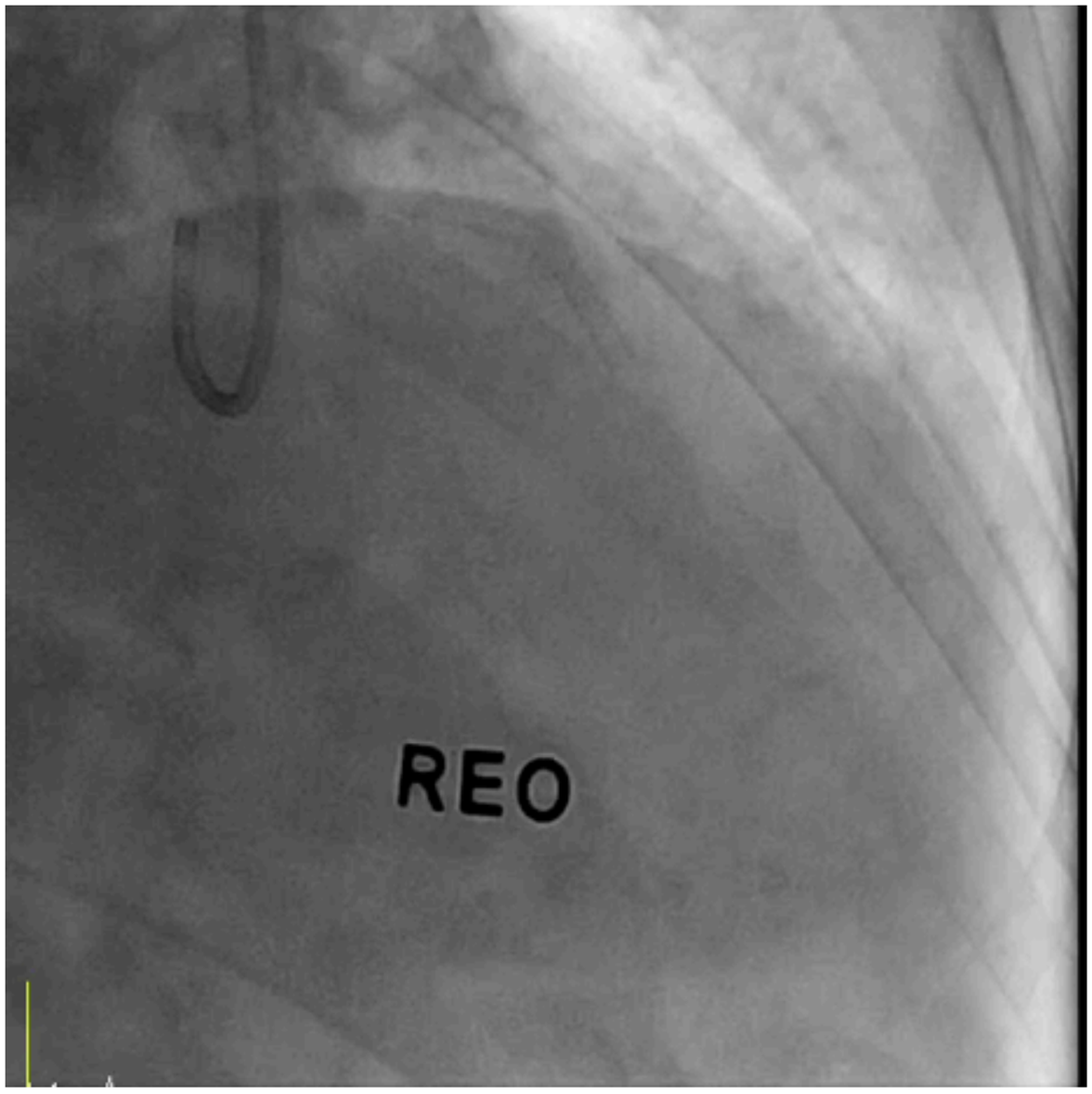

10
20
30
40
mm
mm
0
2
D

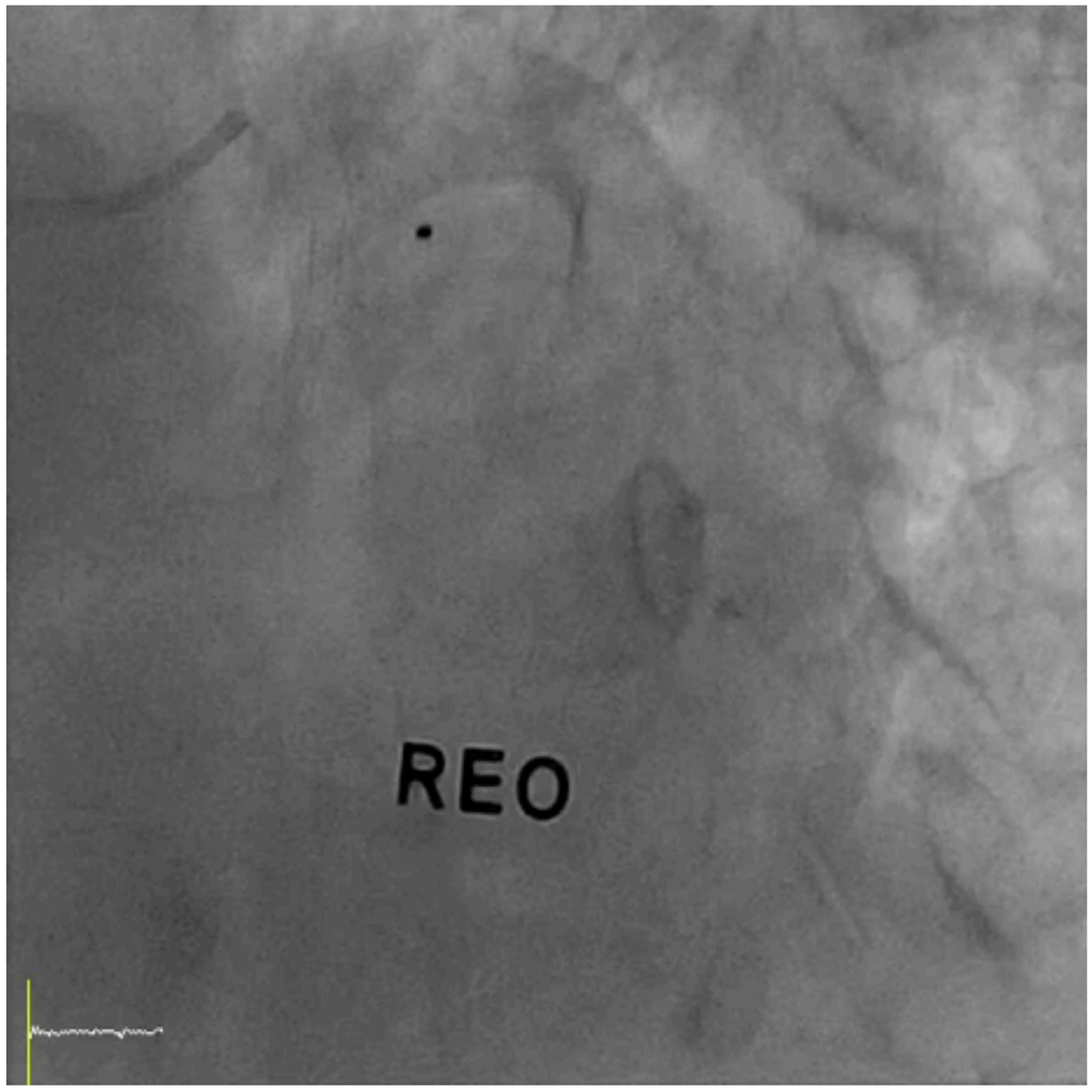
Case 6// 60 YO Female, UA



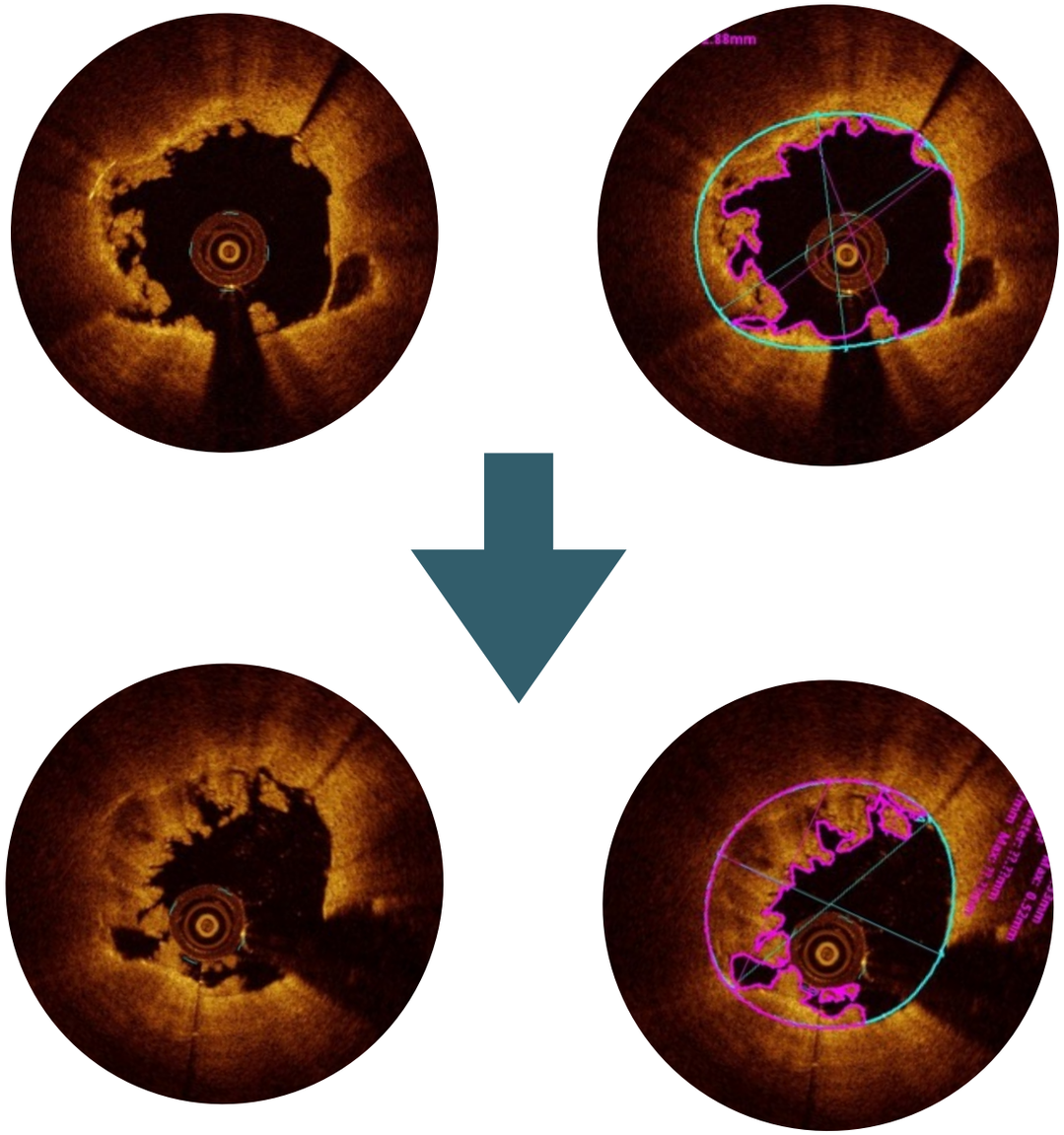


Case 6// 60 YO Female, UA





Prediction of early stent thrombosis



OCT can detect very subtle change of TP.

It is angiographically undetected subtle change, but it can be preceding finding of a serious complication.

Summary

- Intravascular optical coherence tomography (OCT) can add diagnostic value to angiography.

- Intravascular OCT has excellent ability in detecting intraluminal thrombus when compared with CAG & IVUS, and it can fulfill angiographic limitations in ambiguous lesions.

- For BRS evaluation, Intravascular OCT is tool of choice.

- Tissue prolapse happens more often in ACS, it can be well detected by OCT.

Disease is very old, and nothing about it has changed.

It is we who changes as we learn to recognize what was formerly imperceptible.

Jean Martin Charcot