Interesting Image Case Review

The Image Evaluation in Which Use the IVUS Still Is Excellent

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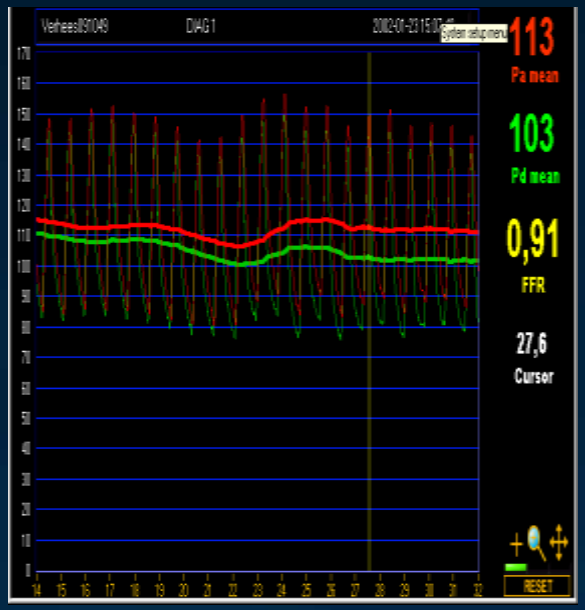
CONTENTS

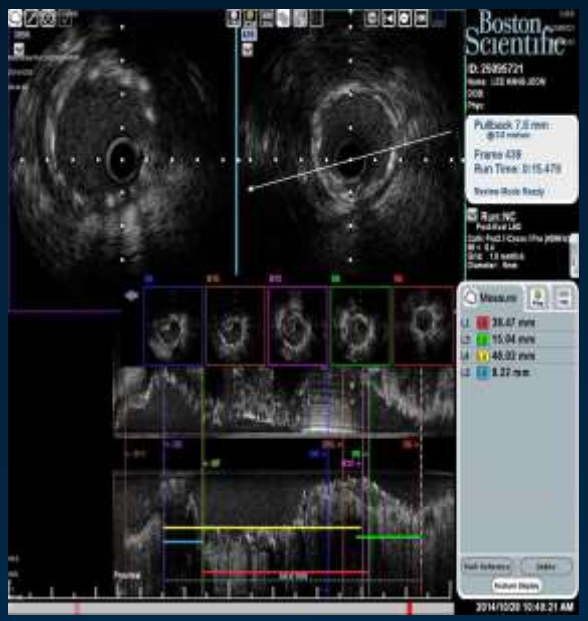
BACKGROUND

THE QUESTION

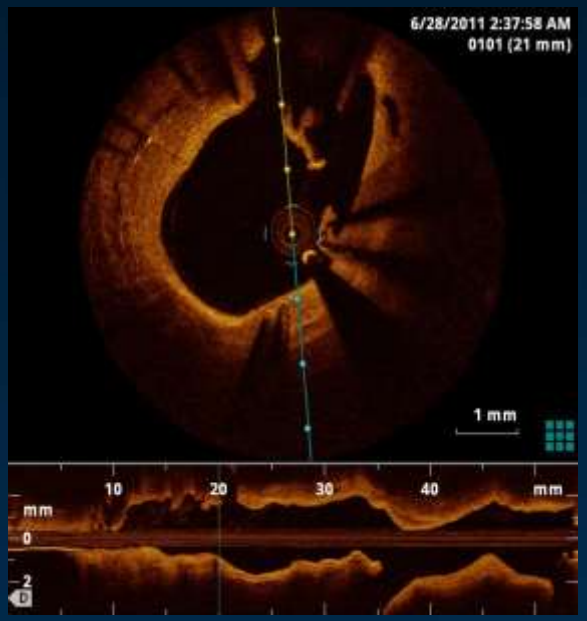
If but only 1 chooses of the next.



FFR

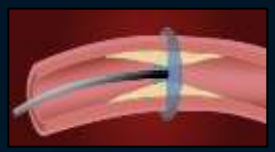


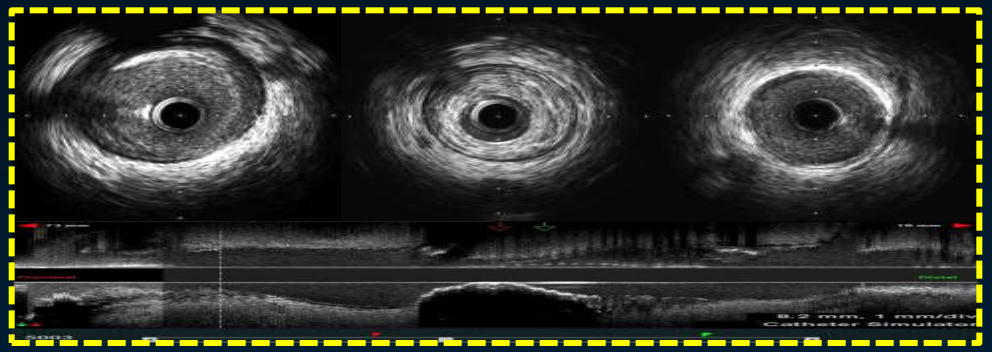
IVUS



OCT

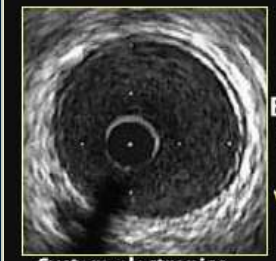
IVUS (IntraVascular UltraSound)





IVUS Technology

Review of Ultrasound Principles



Electrical Impulse

- Developed by Bom (Rotterdam, 1971)
- Mid-1980s: Development of Technology
- 1988: First Image of a Human Vessel

System electronics process the signal

Reflection Tissue

Tissue

Electrical Current (Piezoelectric Crystal)
- Expansion – Contraction
- Sounds Wave Production

High frequency sound waves echo off vessel walls and are sent back to system

Each has advantages, but

Assesses success of PCI

*It is possible to reduce the unnecessary PCI.

*Assistance in clinical research

*Patients benefit from cost

Stent underexpansion PLUS

*Geographical miss

(major edge dissections, plaque burden >50%)

*Diagnostic IVUS helps in certain circumstances

Stent underexpansion PLUS

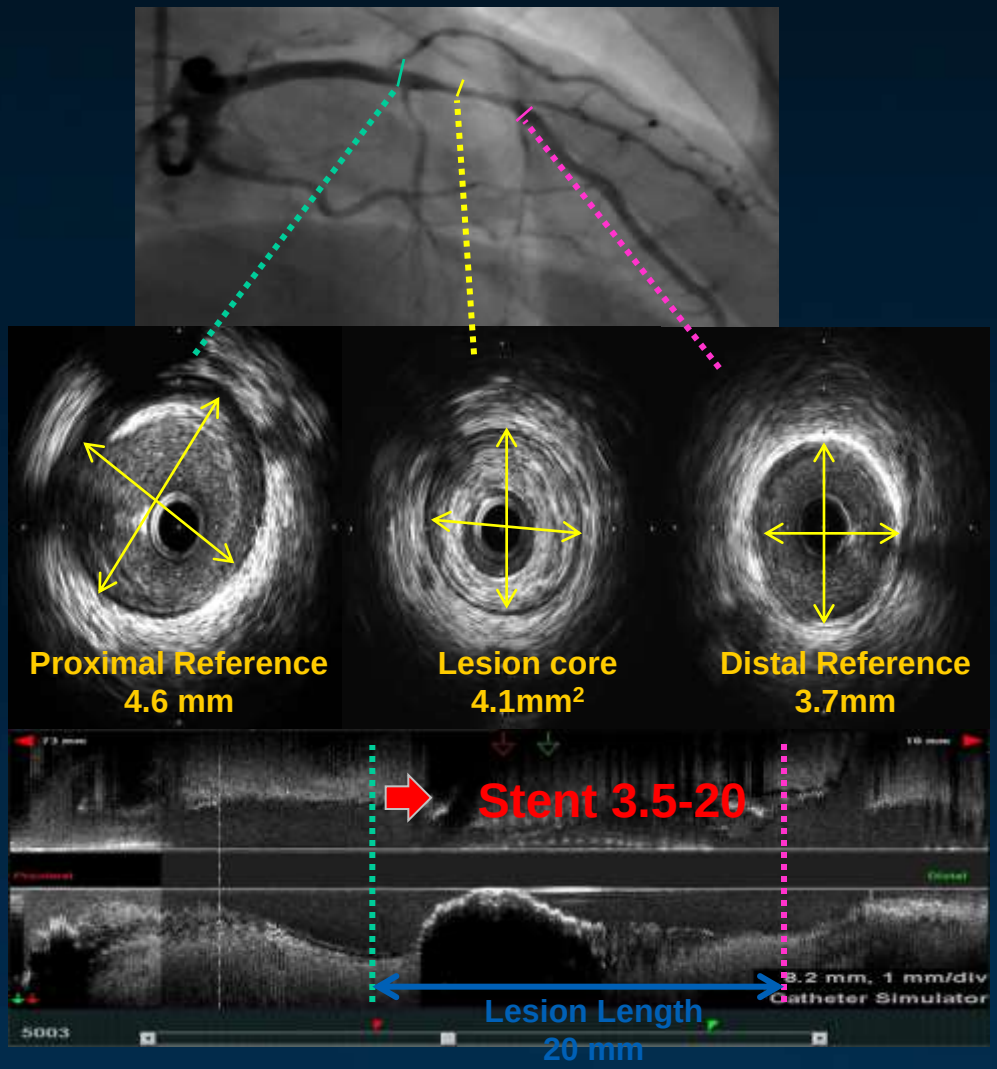
*Findings not seen on IVUS

*Minor malapposition

*Minor tissue protrusion

*Small edge dissections

We chose IVUS is ...



Proximal & Distal Ref → **Stent Diameter**

- The site with the largest lumen proximal & diatal to a stenosis but within the same segment (usually within 10 mm of the stenosis with no major intervening branches).

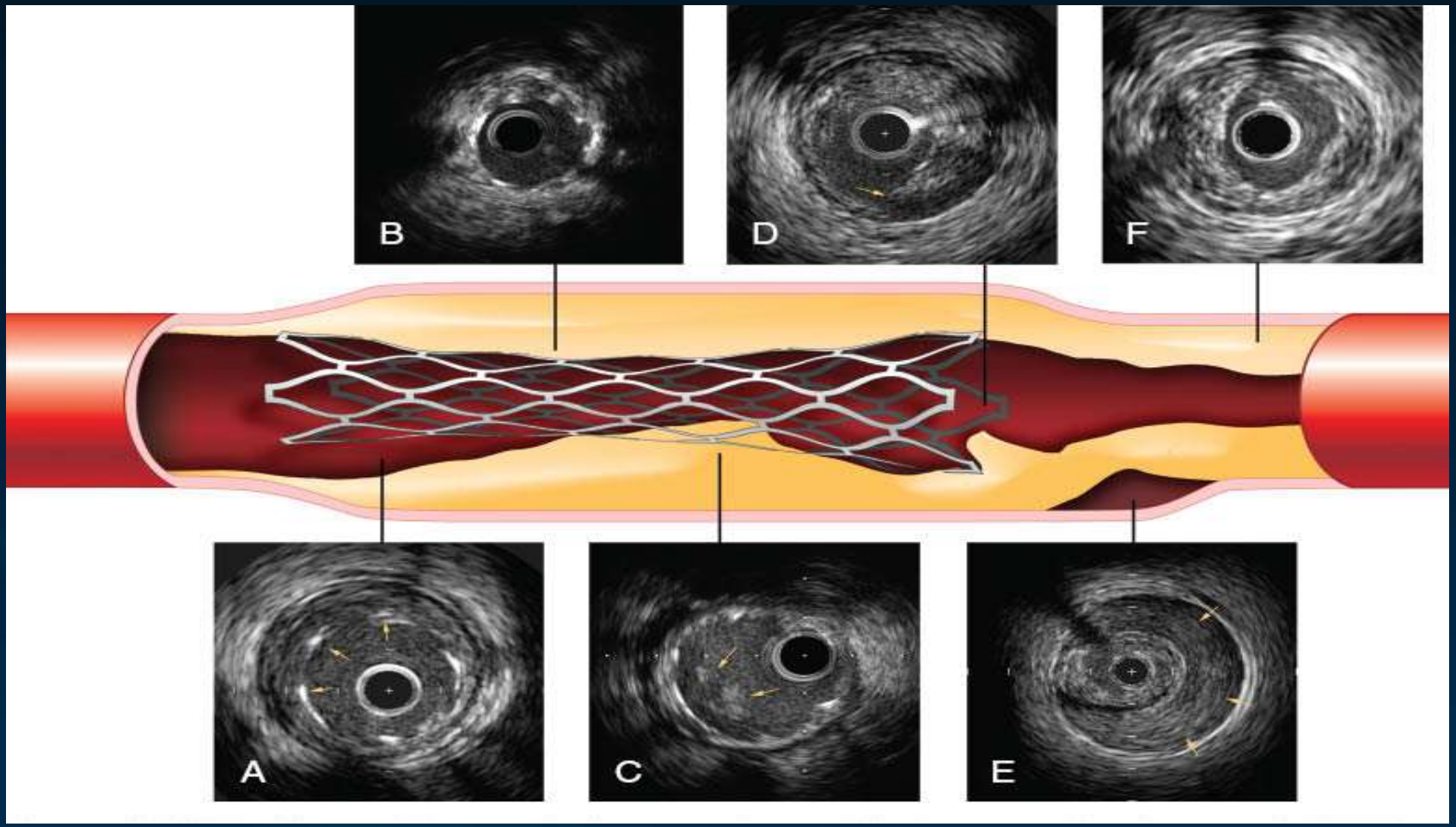
- This may not be the site with the least plaque ; cross-sectional image that has < 40% plaque burden

Lesion Length → **Stent Length**

- Proximal landing zone to Distal landing zone

We chose IVUS is ...

IVUS at Immediate Post-Stenting



CASE

CASE 1

1. Patient :F/55

2.Chief Complaint
stable angina(3VD)
-Exertional chest pain , dyspnea – 1 yrs ago

Report

3. Pain Nature :

2011.5월 청소 중 발생한 pain 심하게 있었고 (10분) 이후 중국병원에서 echo하고 r/o pericardial effusion소견으로 본원 외래에서 시행한 Echocardiogram상 akinesia on basal inf. Wall and hypokinesia on basal inferoseptum of LV (LVEF :55)로 CAG하고 입원

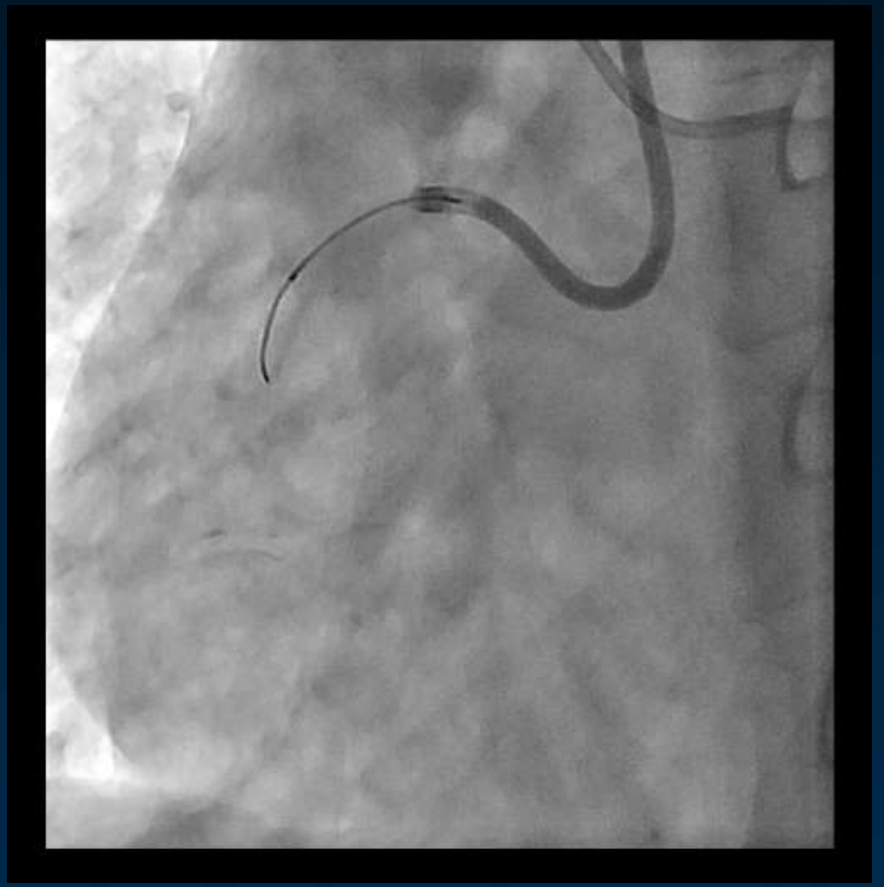
4. Past History :

Past History
- DM(-) / HTN(+) / TB(-) / Hepatitis(-)
- Hyperlipidemia: -
- CML 2005년 진단
- op .Hx :1997년 Myoma myomectomy 1976년 appendectomy

Social History : smoking denial/ alcohol denial

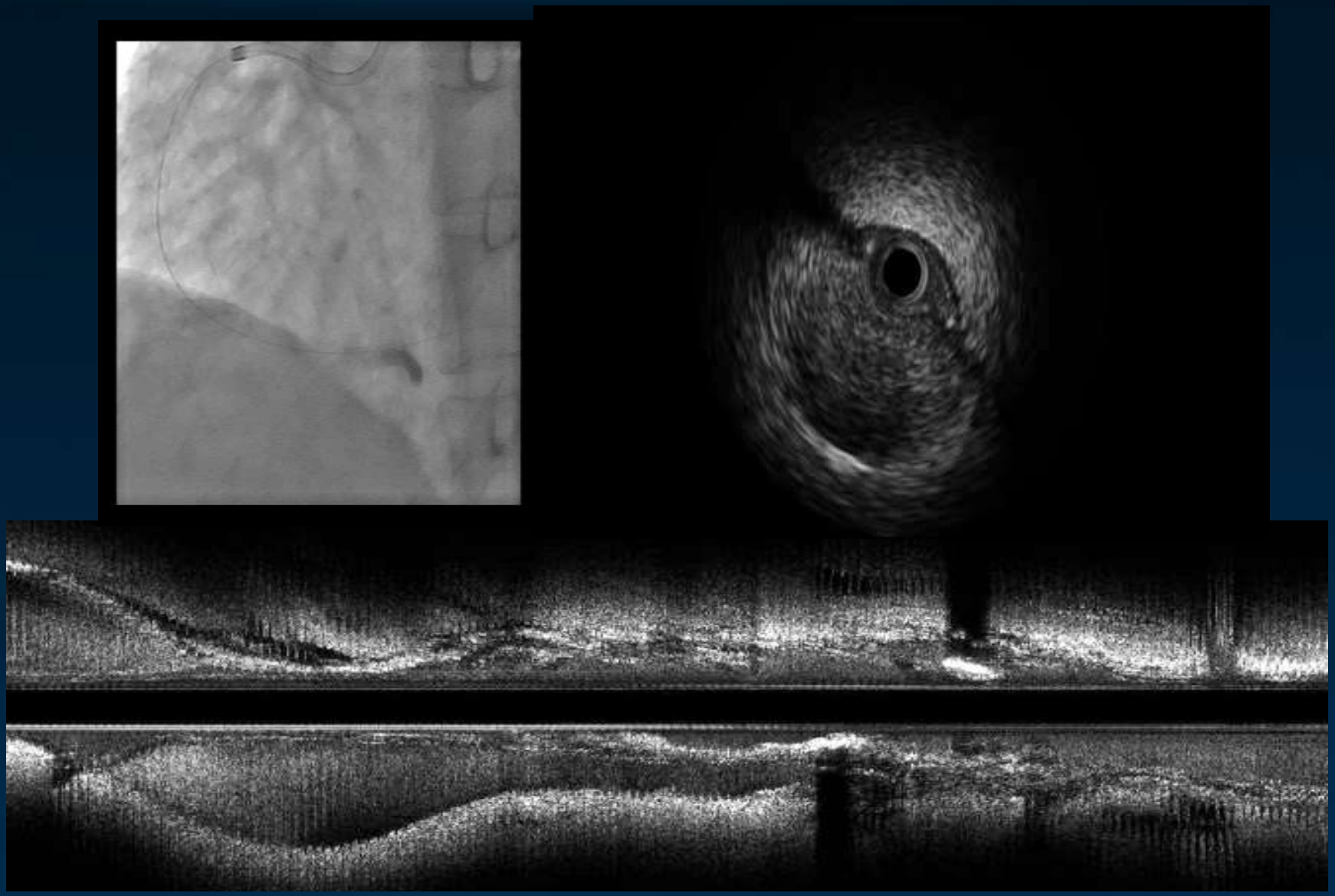
Initial ANGIO

Initila Angio LAO

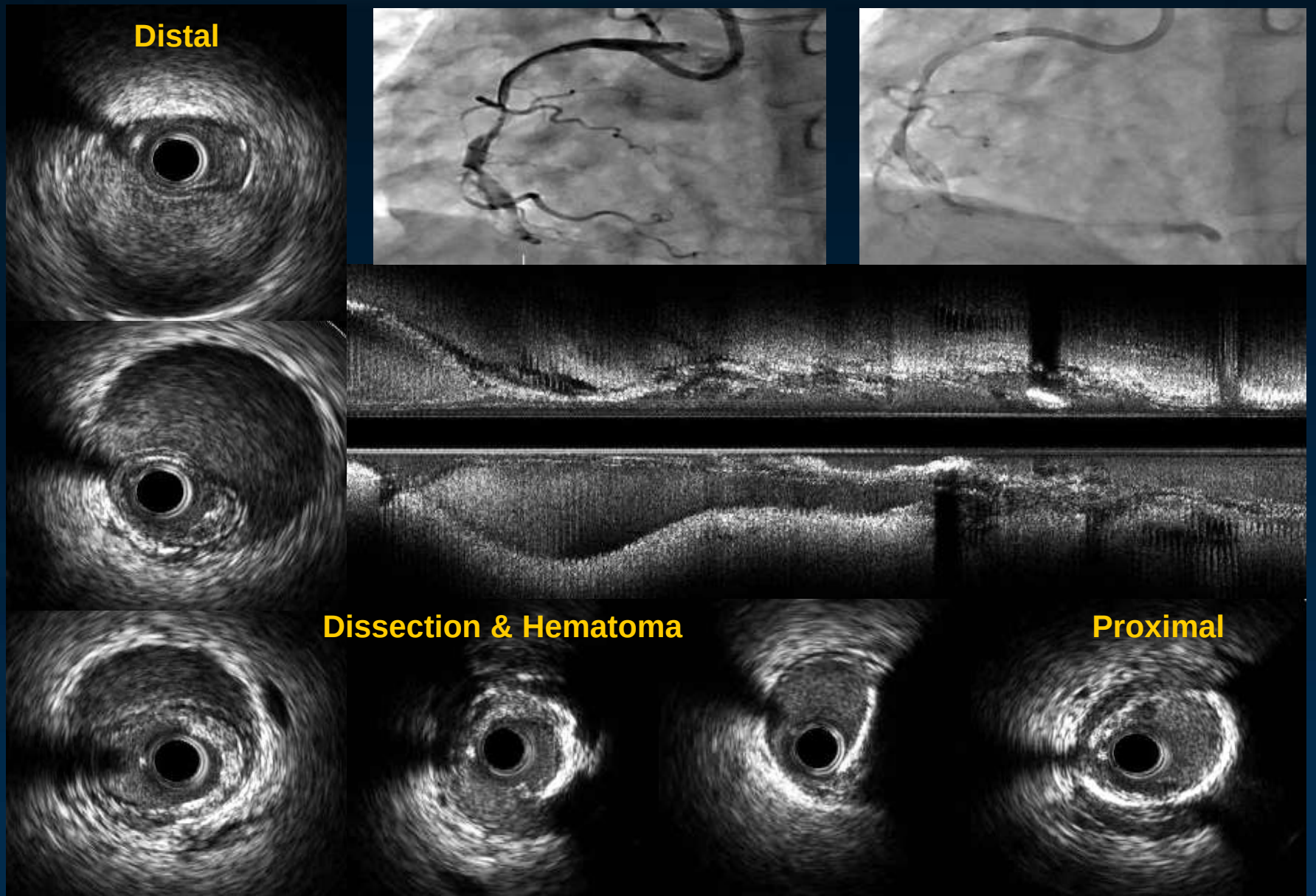


After Wiring with Microcatheter

Initial IVUS

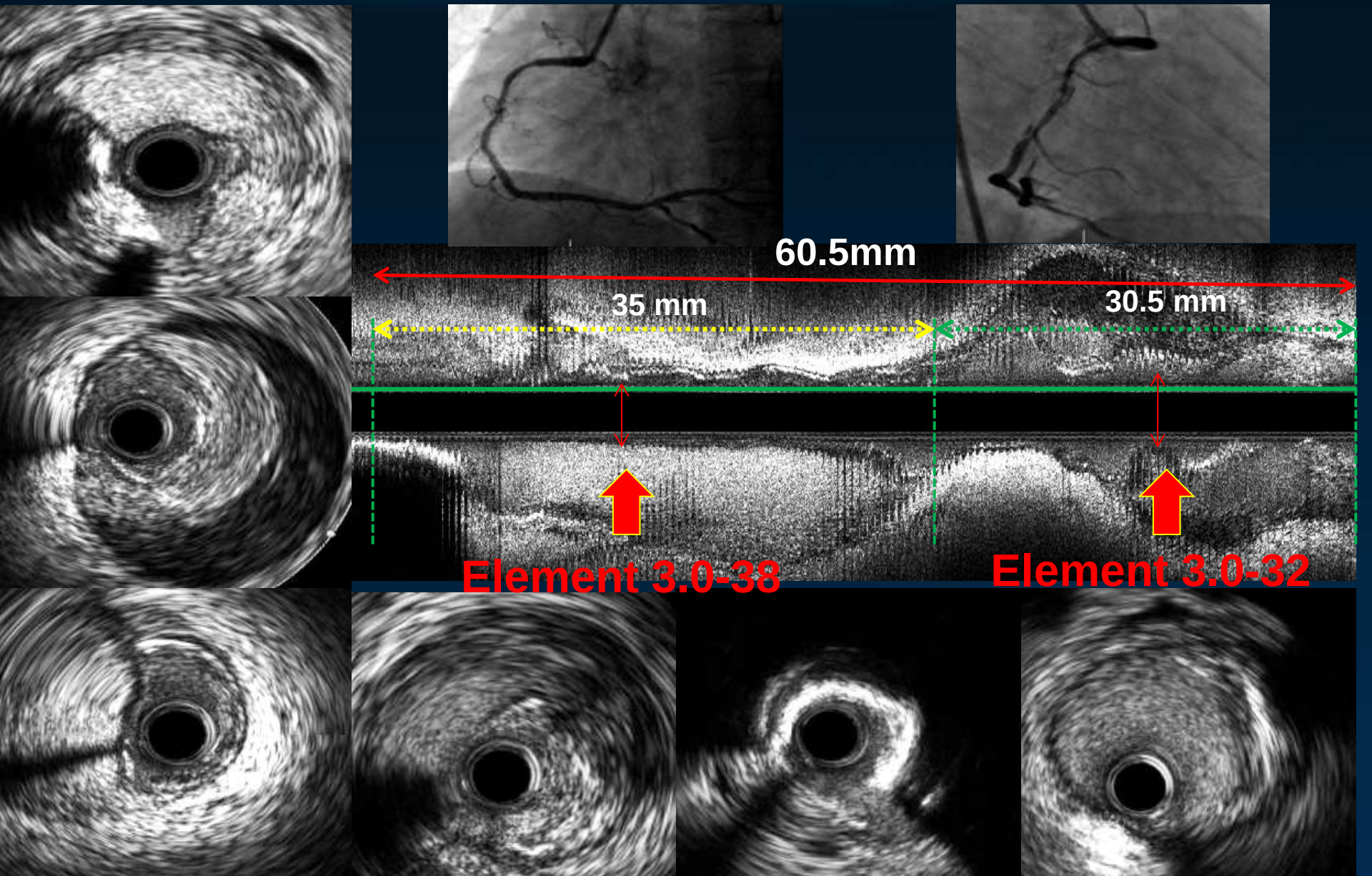


IVUS Analysis

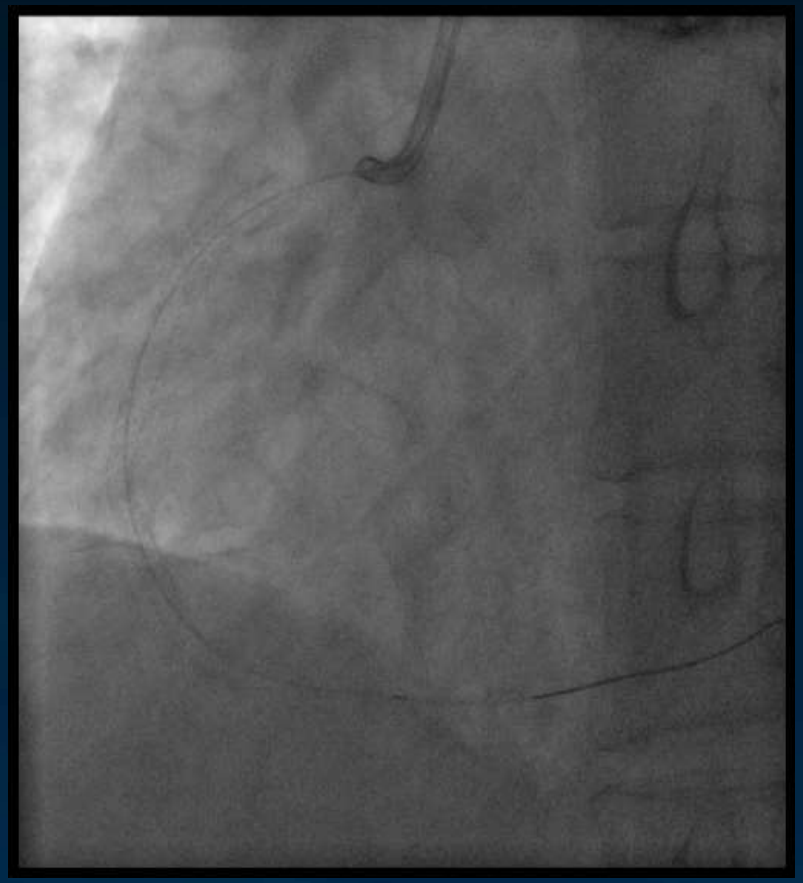


After 5 days

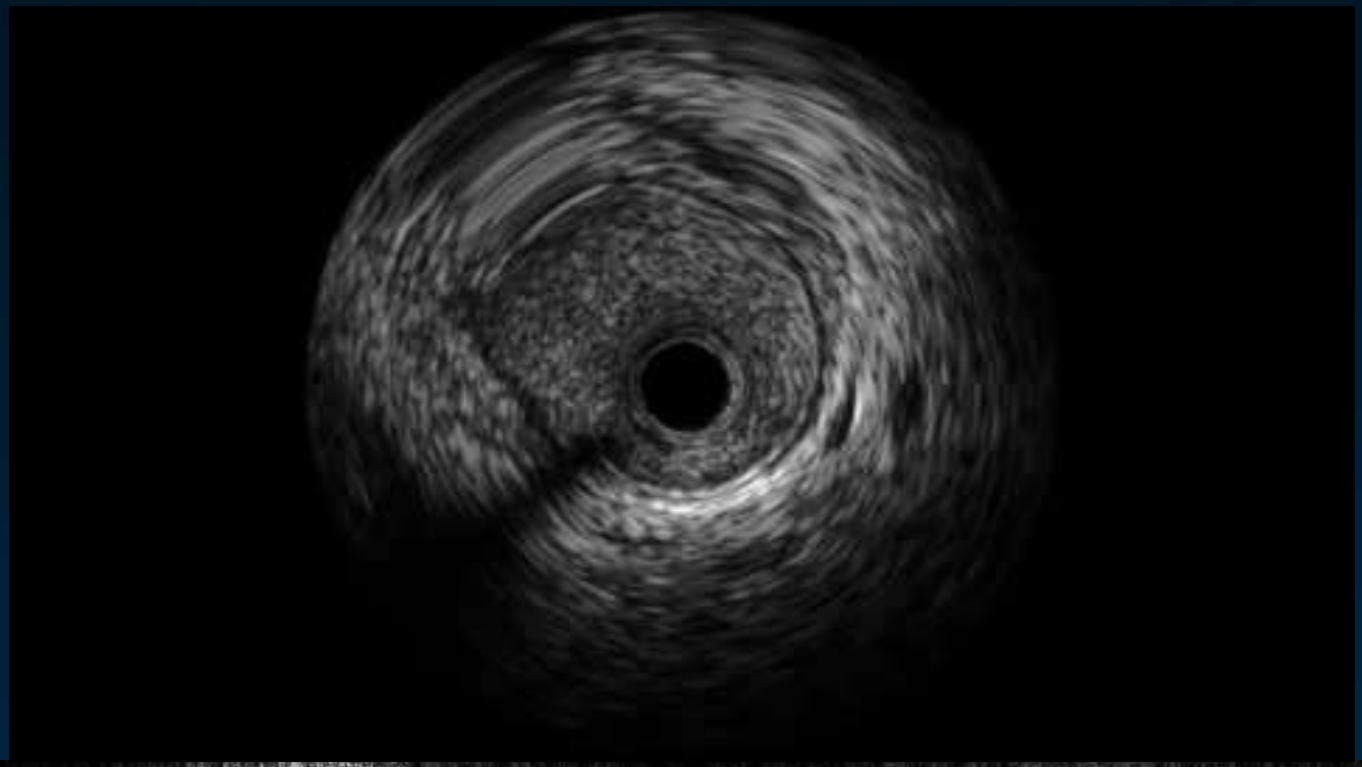
Pre Measurement

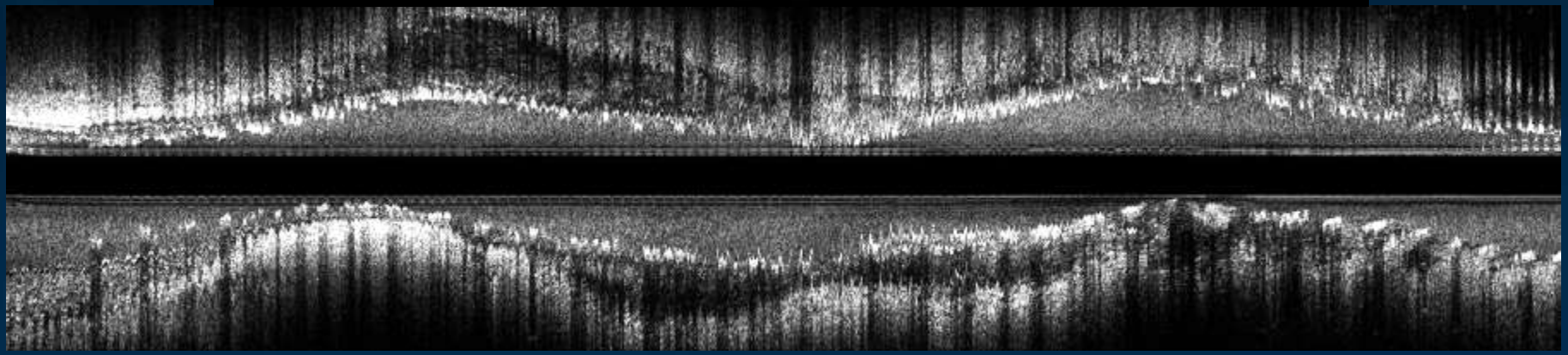


Post Angio

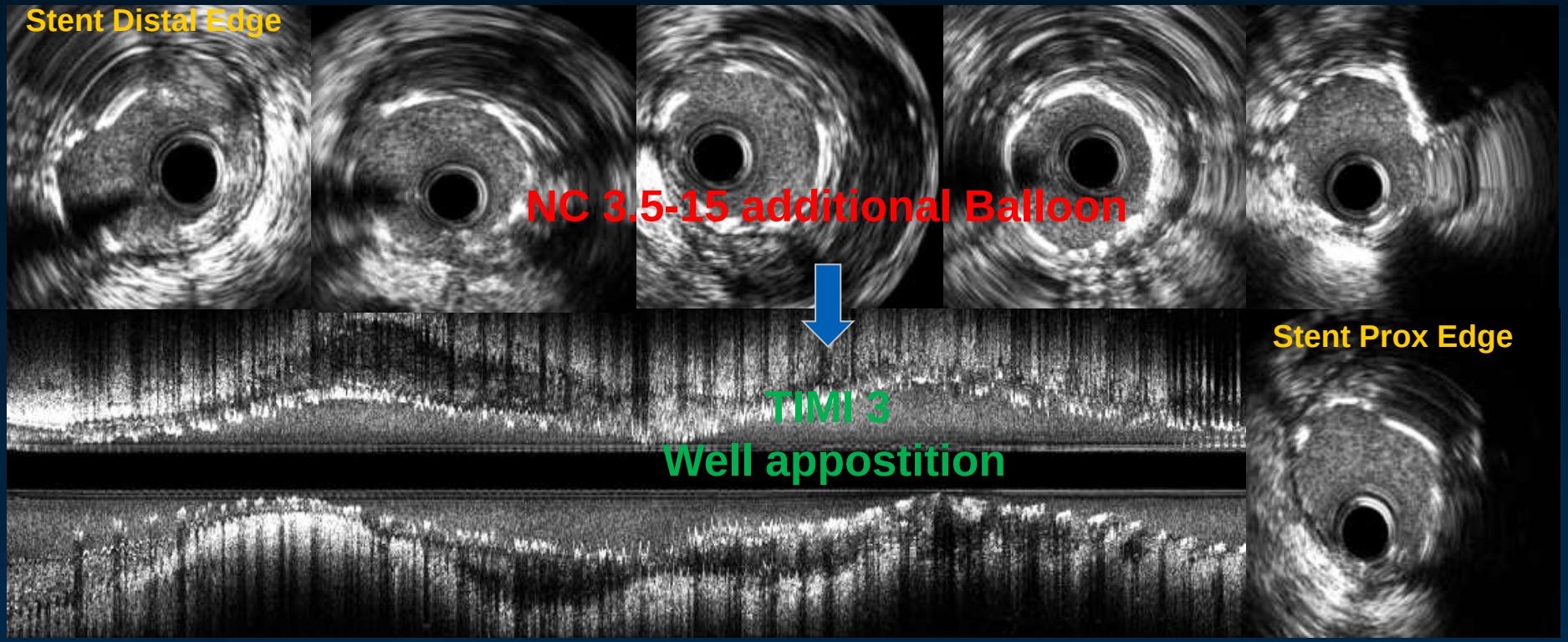


Post IVUS

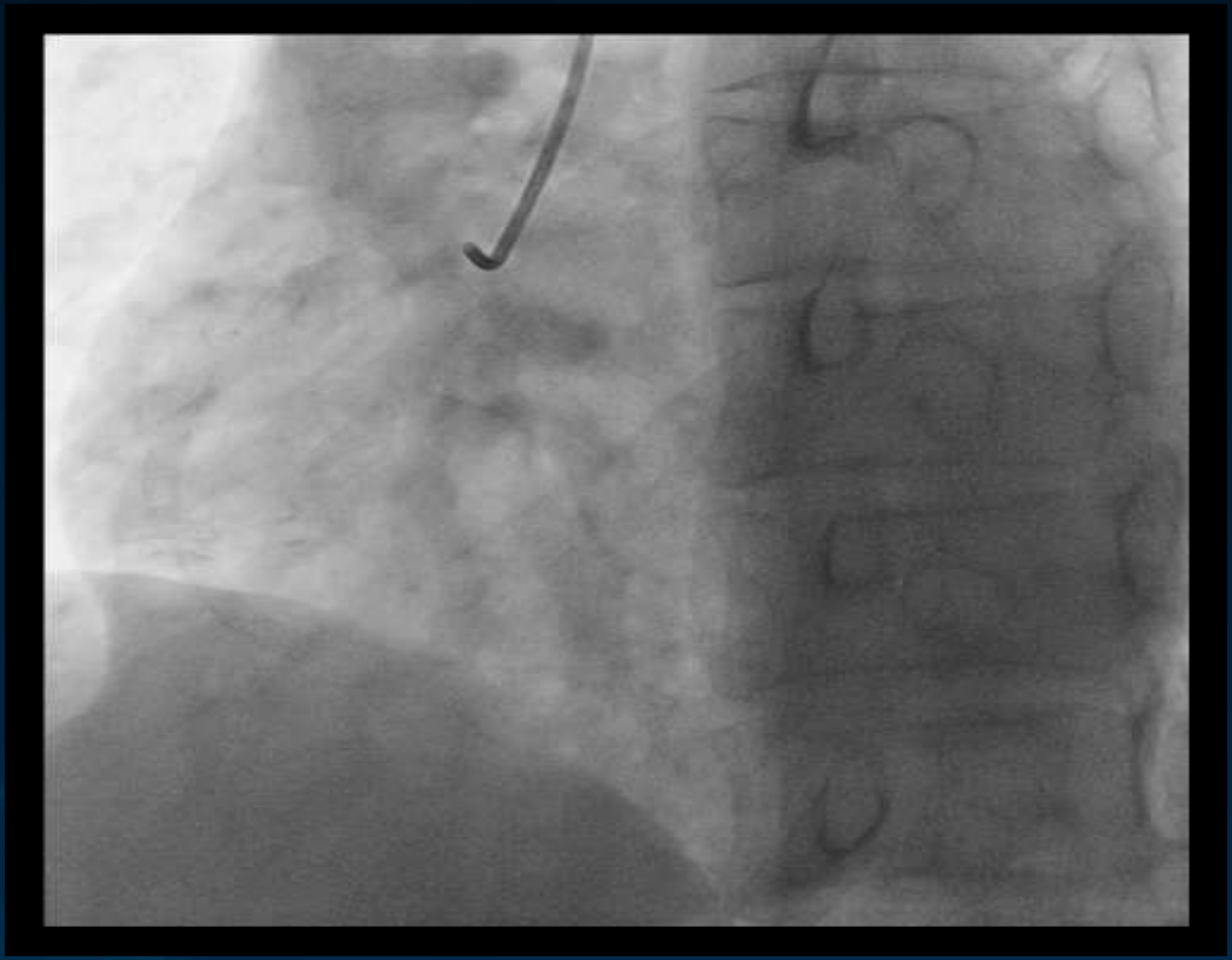




Final Measurement



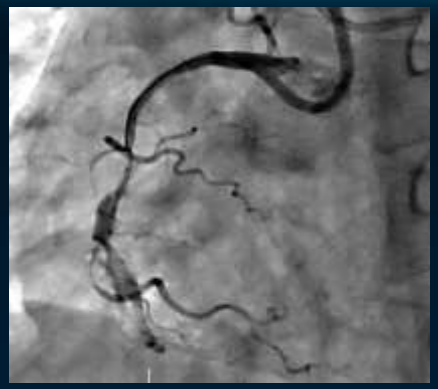
Flow up ANGIO

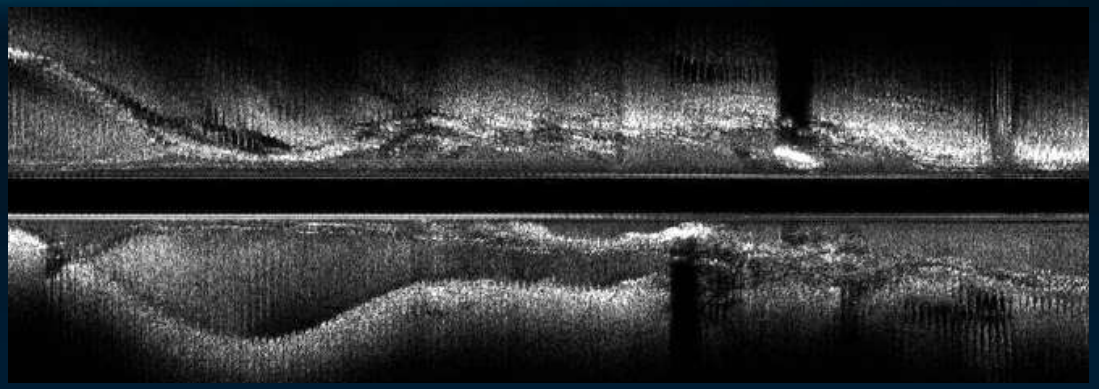


2 years later

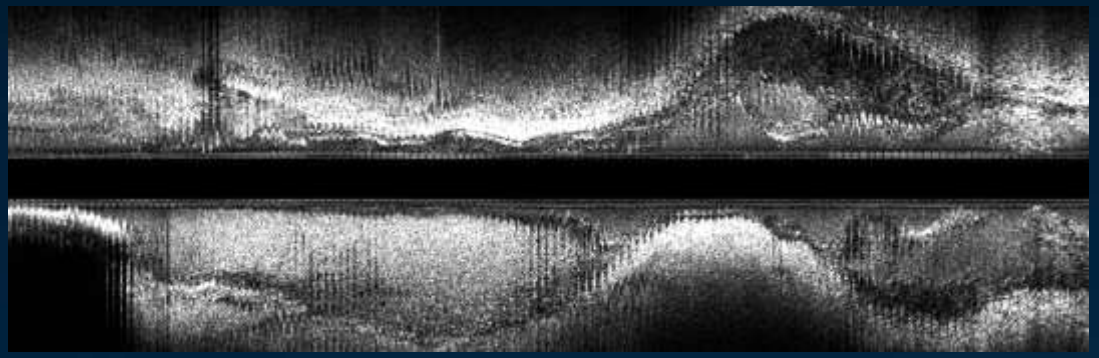
Summary

Milking Hematoma

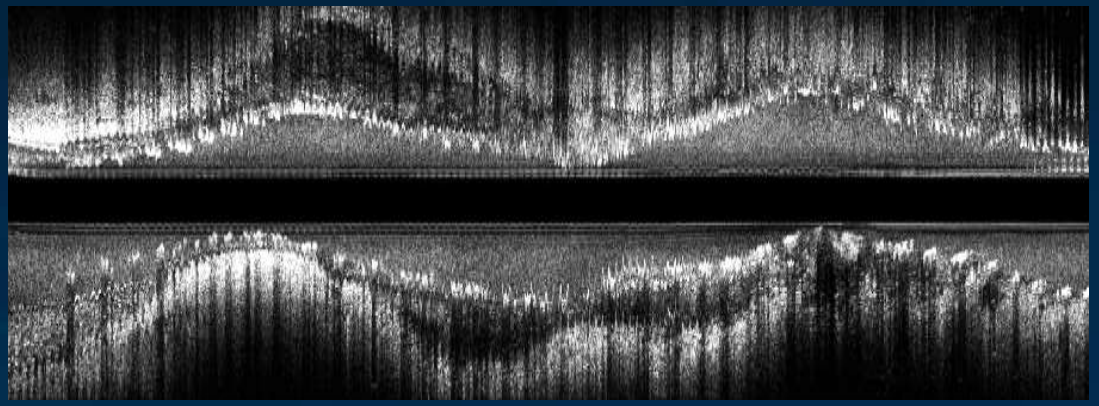




5d later with Med

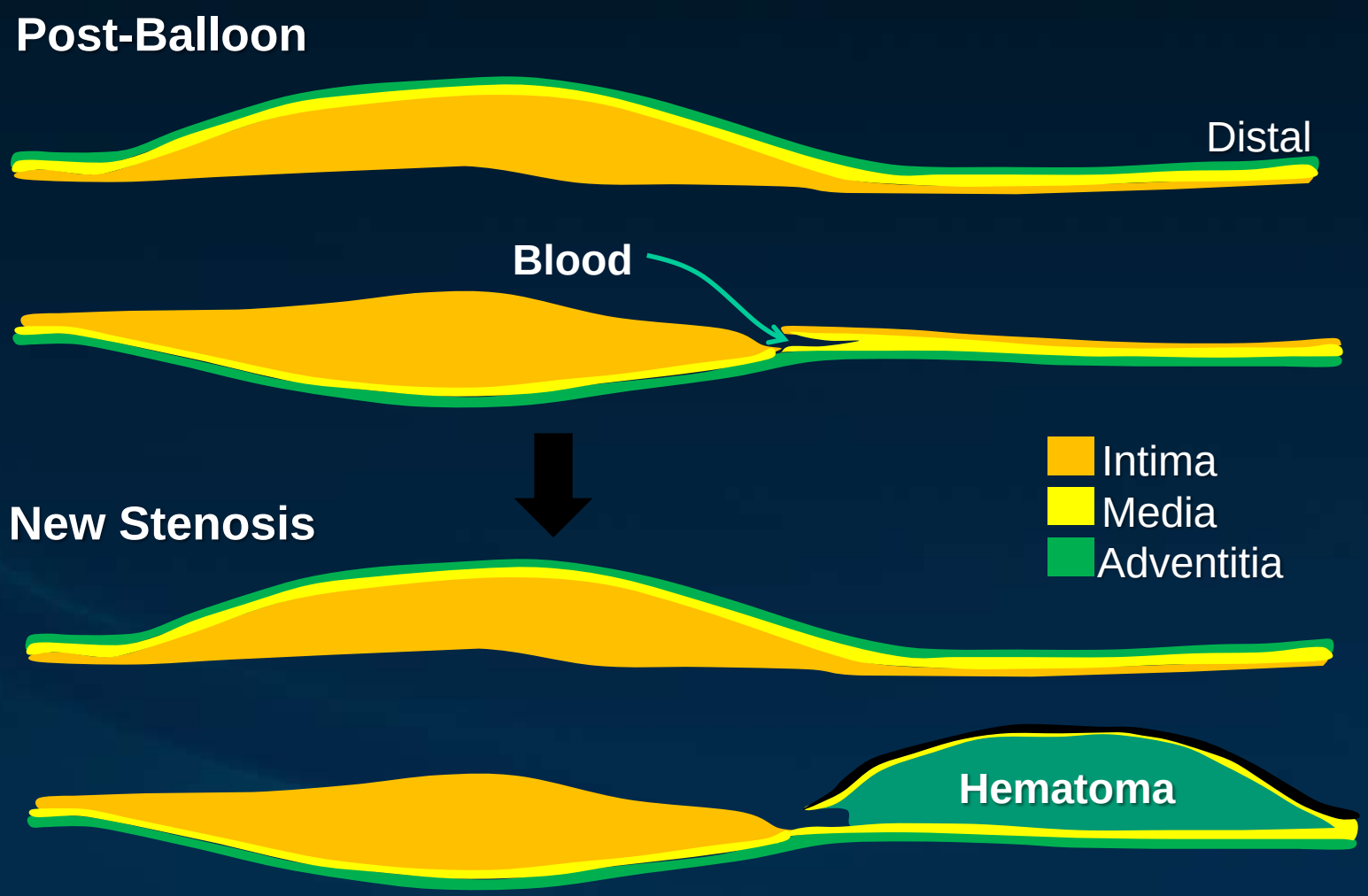


After PCI



Hematoma

Mechanism of Intra-Medial Hematoma



Hematoma

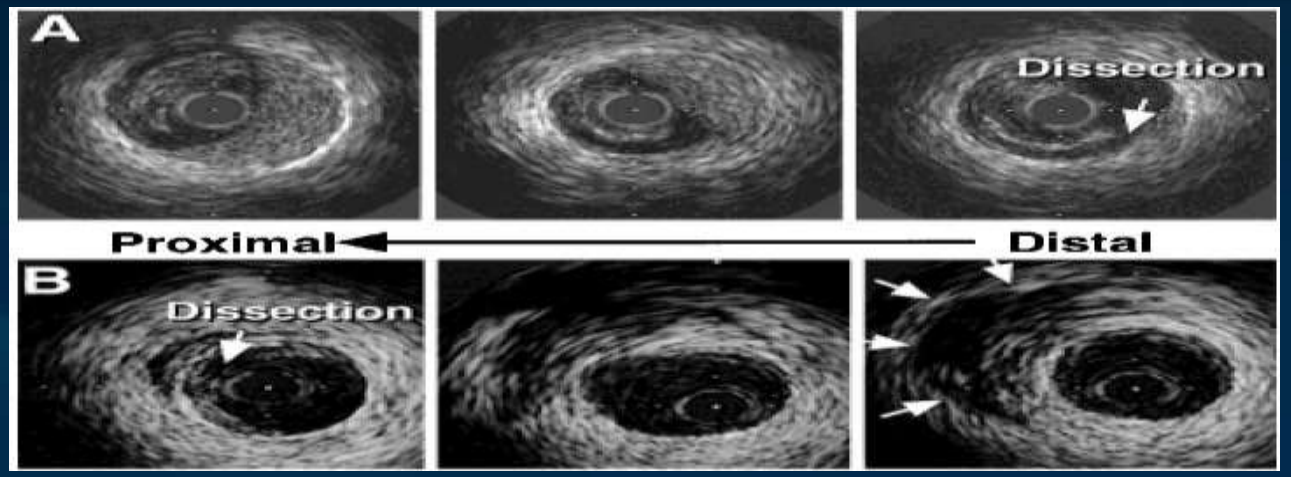
At the site of blood entry into the adventitia, can be a clue to the presence of a hematoma.
- The position of the hematoma (mural side vs free wall) can help in deciding which to treat.
- IVUS can assess the severity of lumen compromise and the possibility of extensive expansion (especially on the non-mural side) and guide appropriate treatment.

<Intramural Hematoma>
- crescent –shaped with straightening of IEM
- separation between IEM and EEM accumulation of blood
- usually homogenous & hyperechoic
- a dissection into the media where accumulation occurred because of a lack of re-entry

<Extramural Hematoma>
- presents with an echo-dim pattern due to the dilution of red blood cell concentration and dissemination throughout an echogenic adventitia

Intramural Hematoma

Extramural Hematoma



CASE 2

Patient :M/62

chest pain ++ 1year

Report

Pain Nature :

***타 병원 CCTA 후 LAD**

이상소견으로 내원

***없음**

*[계획]

CAG

Past History :

HTN: 30

DM: -

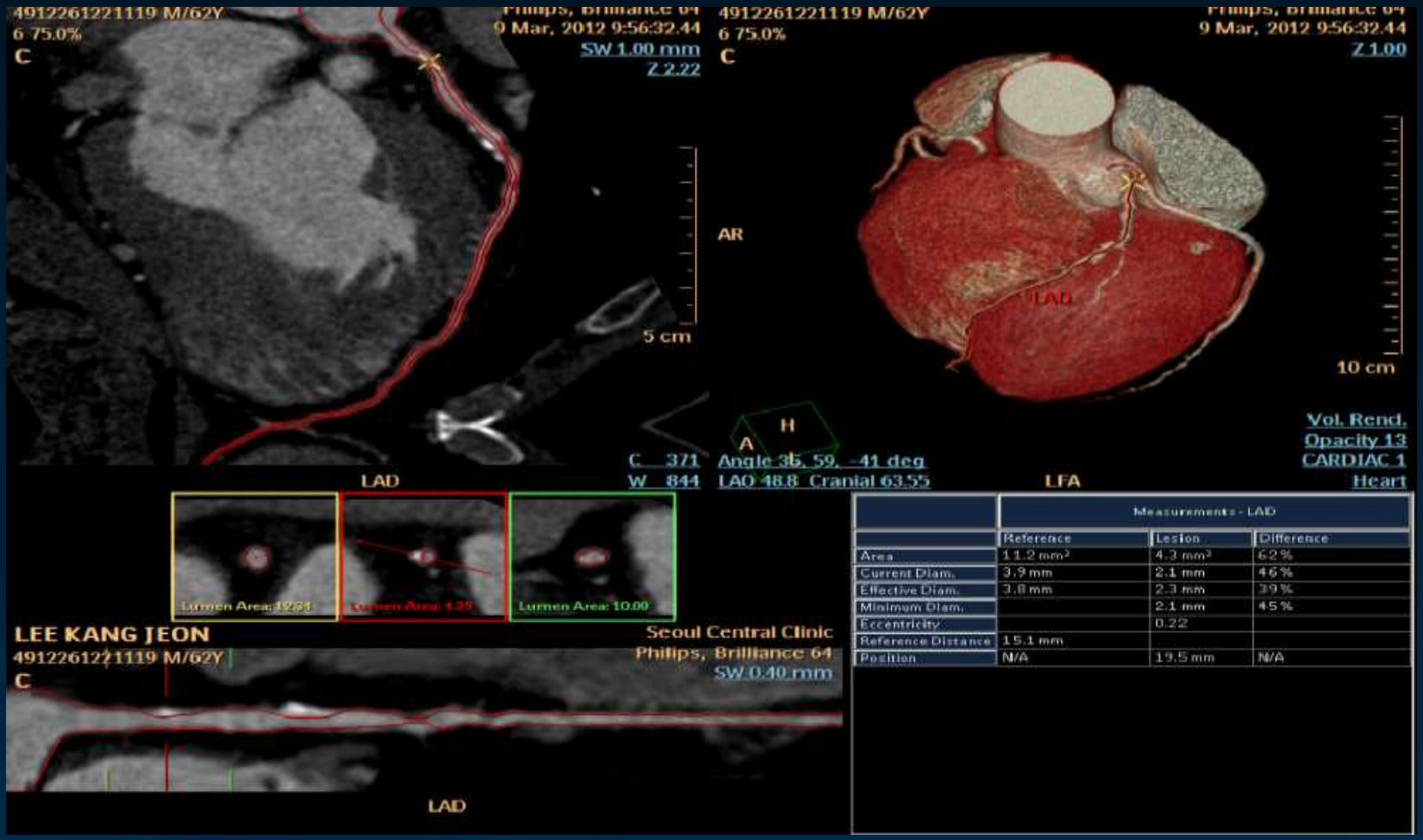
Hyperlipidemia: -

Smoking: - PPD

FH: GF CVA+ Heart Dis-

CASE 2

CT



Measurements - LAD			
	Reference	Lesion	Difference
Area	11.2 mm²	4.3 mm²	62 %
Current Diam.	3.9 mm	2.1 mm	46 %
Effective Diam.	3.8 mm	2.3 mm	39 %
Minimum Diam.		2.1 mm	45 %
Eccentricity		0.22	
Reference Distance	15.1 mm		
Position	N/A	19.5 mm	N/A

LAD

1. Diffuse lesion 60~70%

2. MIBIMUN DIAMETER – 2.1mm

Initial ANGIO

LCA AP

RAO CRANIAL

LAO CRANIAL

Initial ANGIO

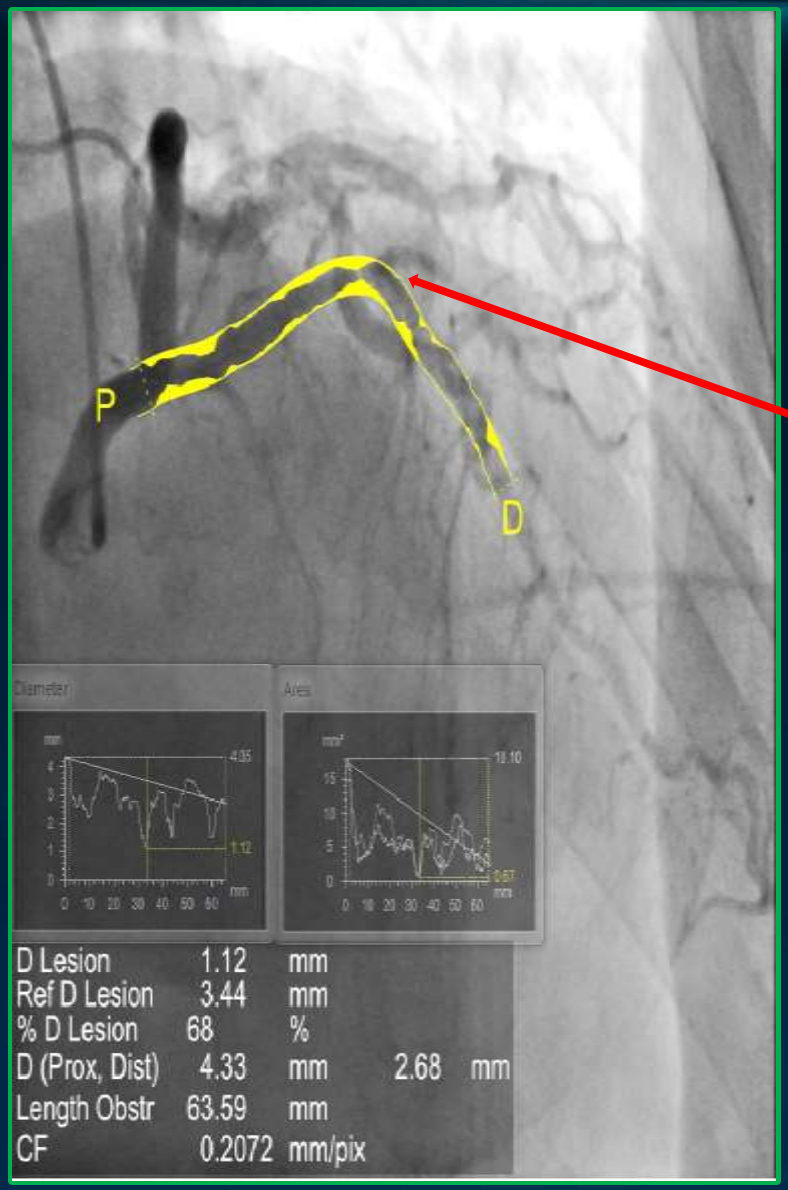
LAO CAUDAL

RAO CAUDAL

LAO RCA

CASE 2

QCA & FFR



LEAVE IT

2 YEAR WENT BY....

CASE 2

Patient :M/64

Chest discomfort Pain

Report

Pain Nature :

통증 : 무(0)

Pain Scale : NRS

exertional chest pain

(쉬면 좋아짐)

Past History :

2012.3 CAG - FFR 0.86

mLAD - tubular stenosis upto 60%

145/90-55

RHB s m

CBS s r

Initial ANGIO

LCA AP

RAO CRANIAL

LAO CRANIAL

Initial ANGIO

LAO CAUDAL

RAO CAUDAL

LAO RCA

CASE 2

REVIEW

PCI

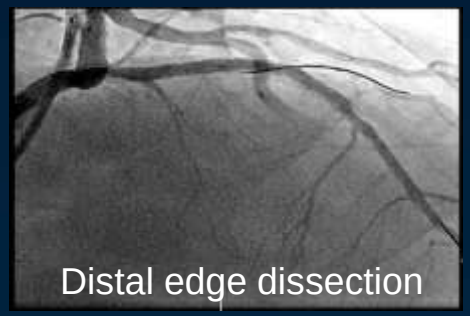
Wiring → **Balloon** → **Stent** → **NC**


RUNTHRUGH - 2

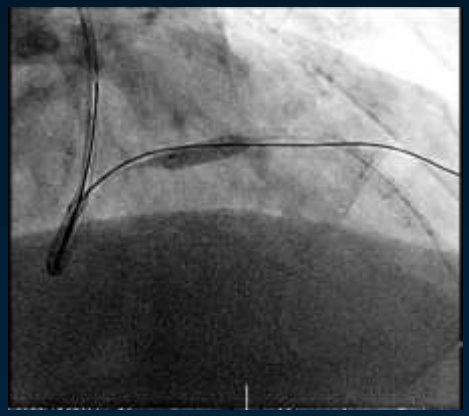

MINI TREK 1.5-15


INVADER 2.5-15


Xie Xpedition 3.5-38


Distal edge dissection

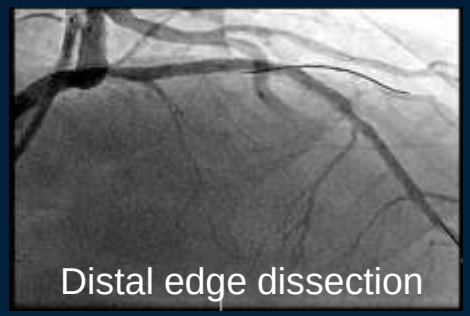

ADD Xie Xpedition 3.0-15

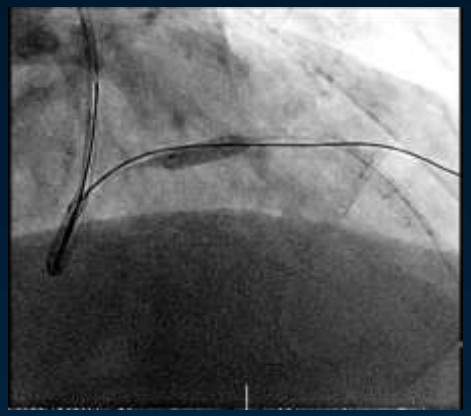



SAPPHIRE NC 4.0-10

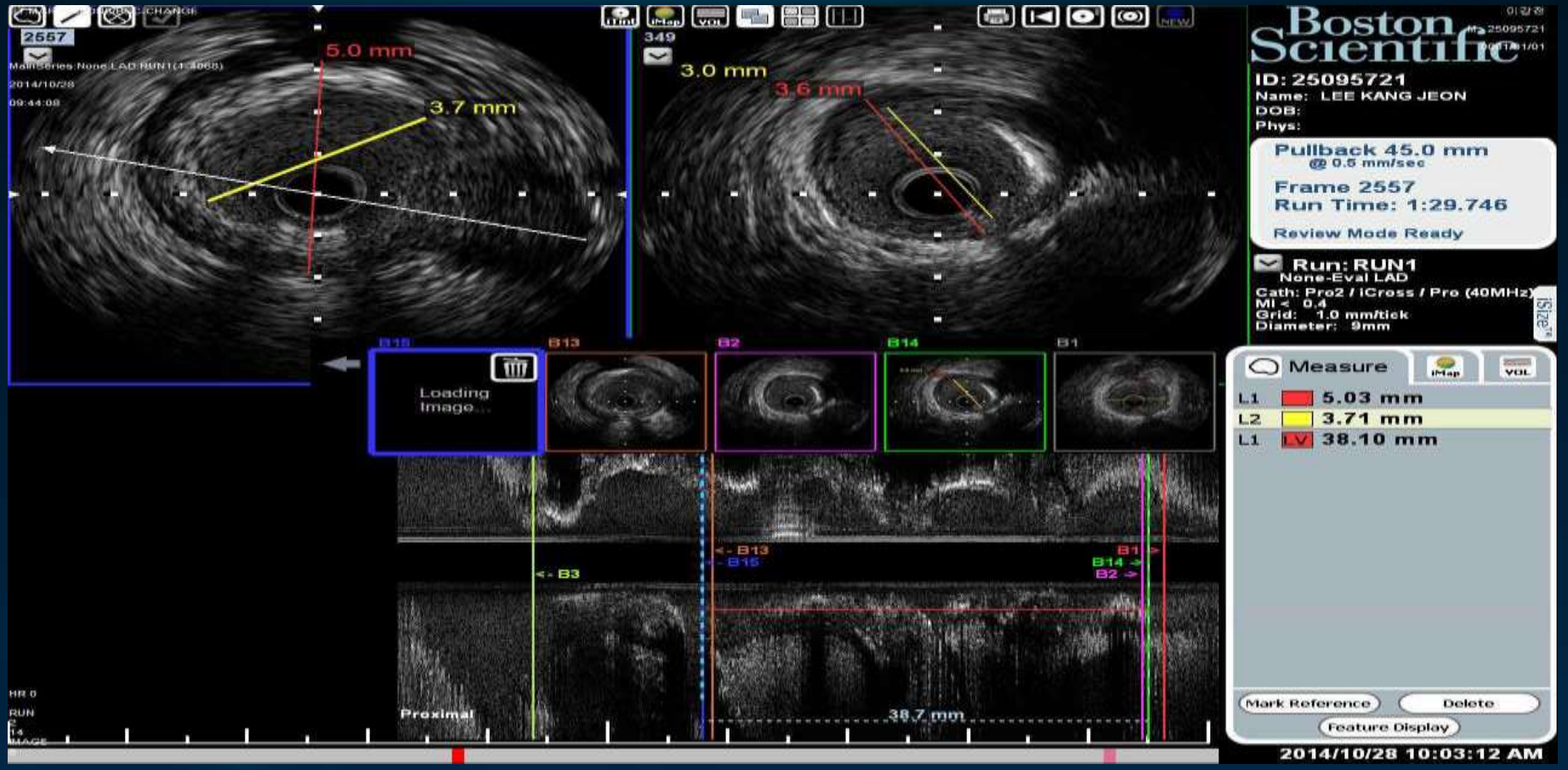
PCI

Wiring → **Balloon** → Stent → NC





Pre Measurement

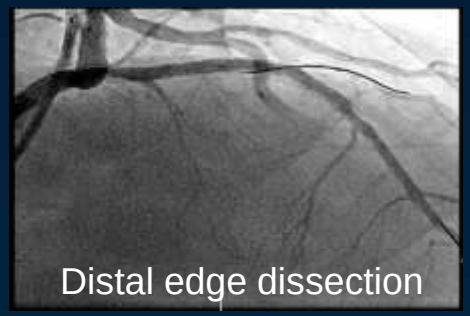


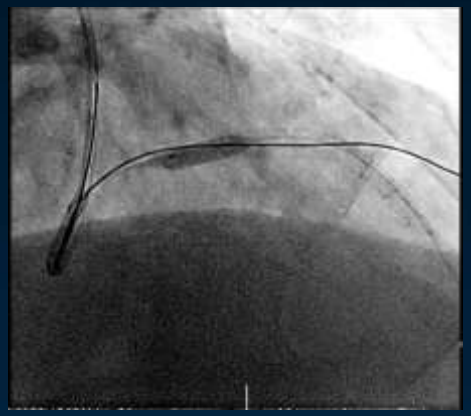
Proximal M to M 5.0 mm
Distal M to M 3.6 mm &
Lesion Length (m to pLAD) 35.14 mm

Stent: 3.5-38 pLAD

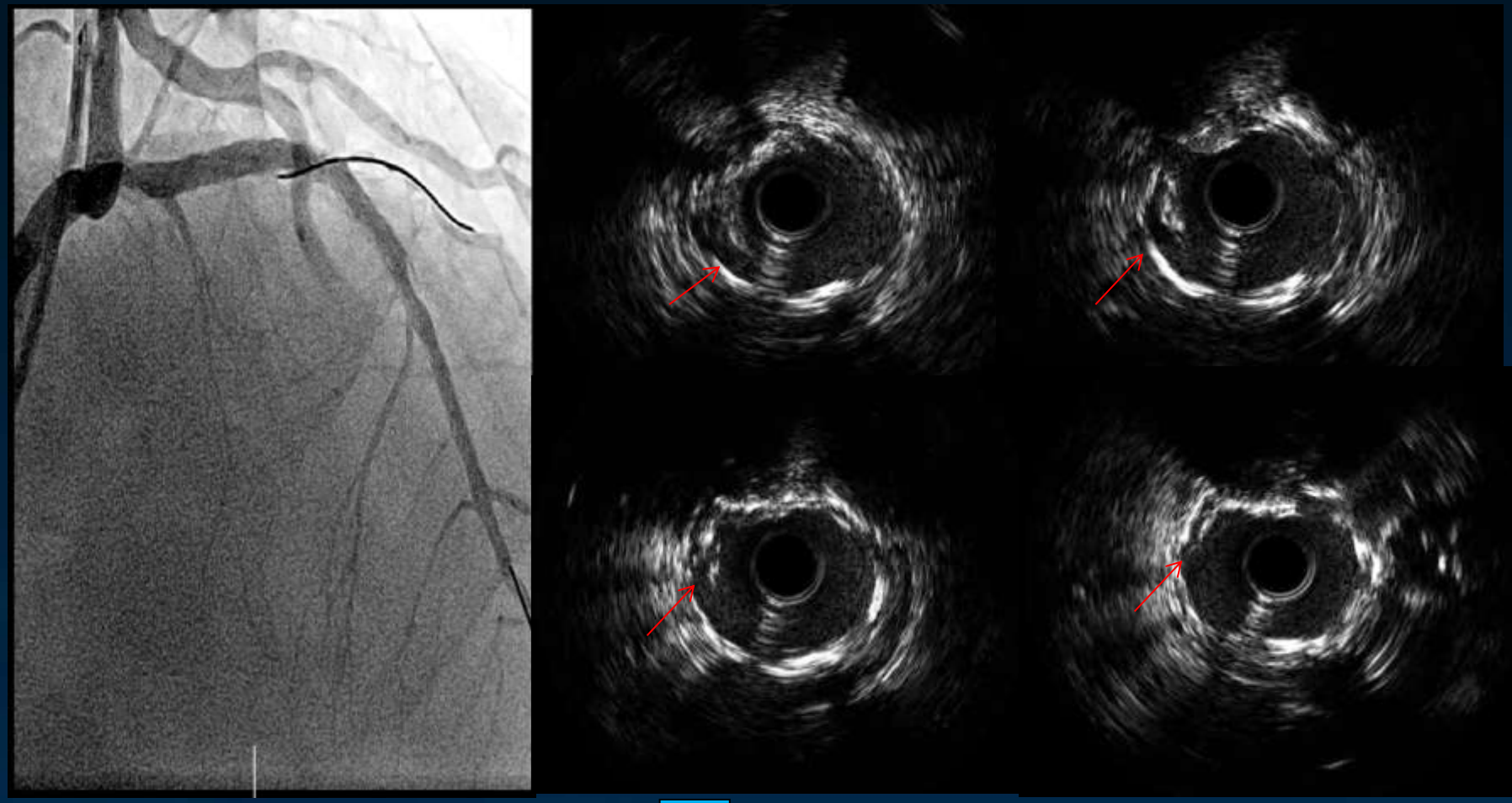
PCI

Wiring → Balloon → Stent → NC





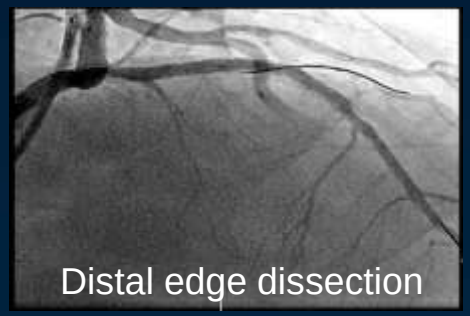
Distal edge dissection

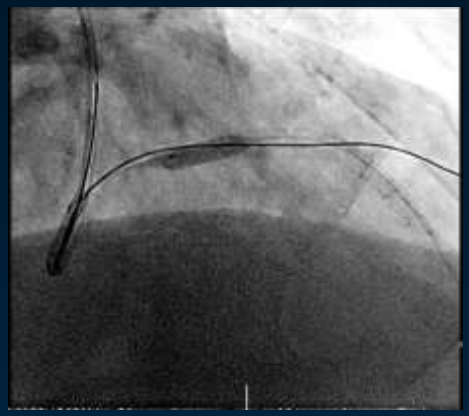


ADD Xie Xpedition 3.0-15

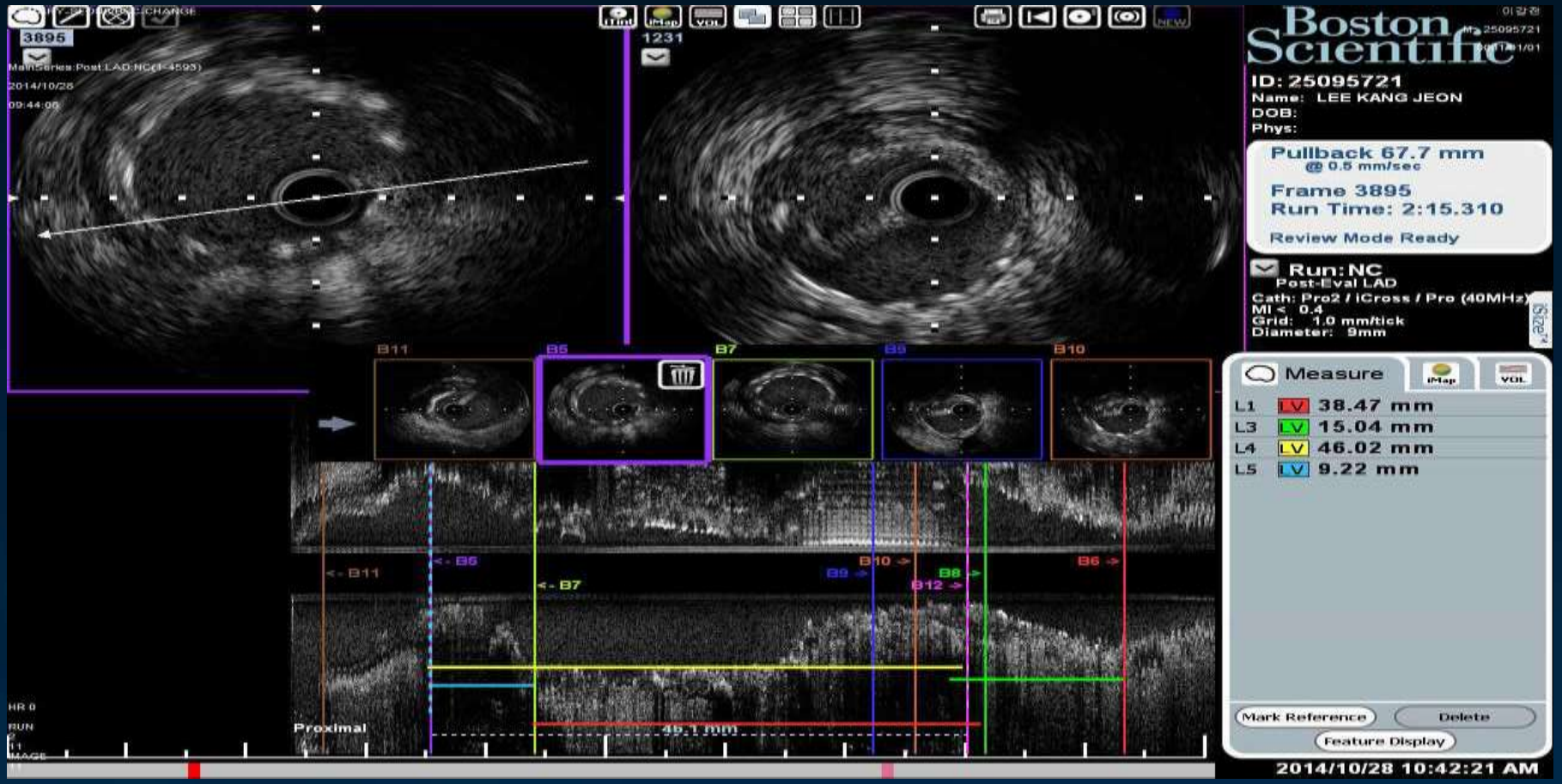
PCI

Wiring → Balloon → Stent → NC



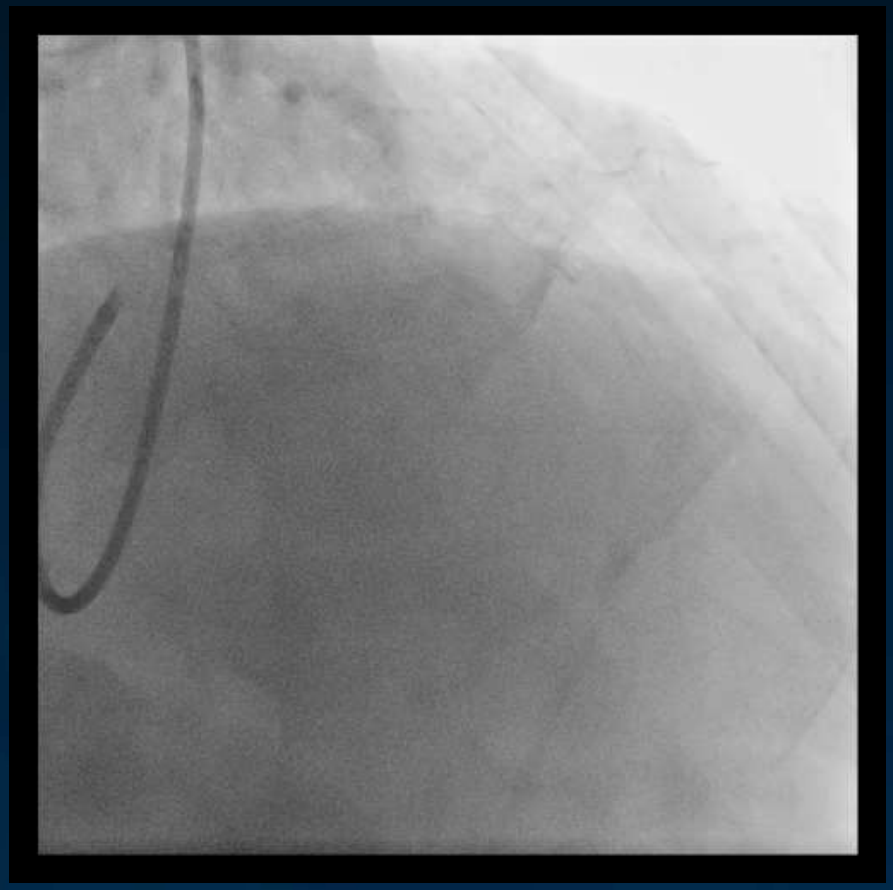


Final IVUS



POST PCI – STENT expansion (good) , apposition (good) , edge Dissection (no)

Final ANGIO

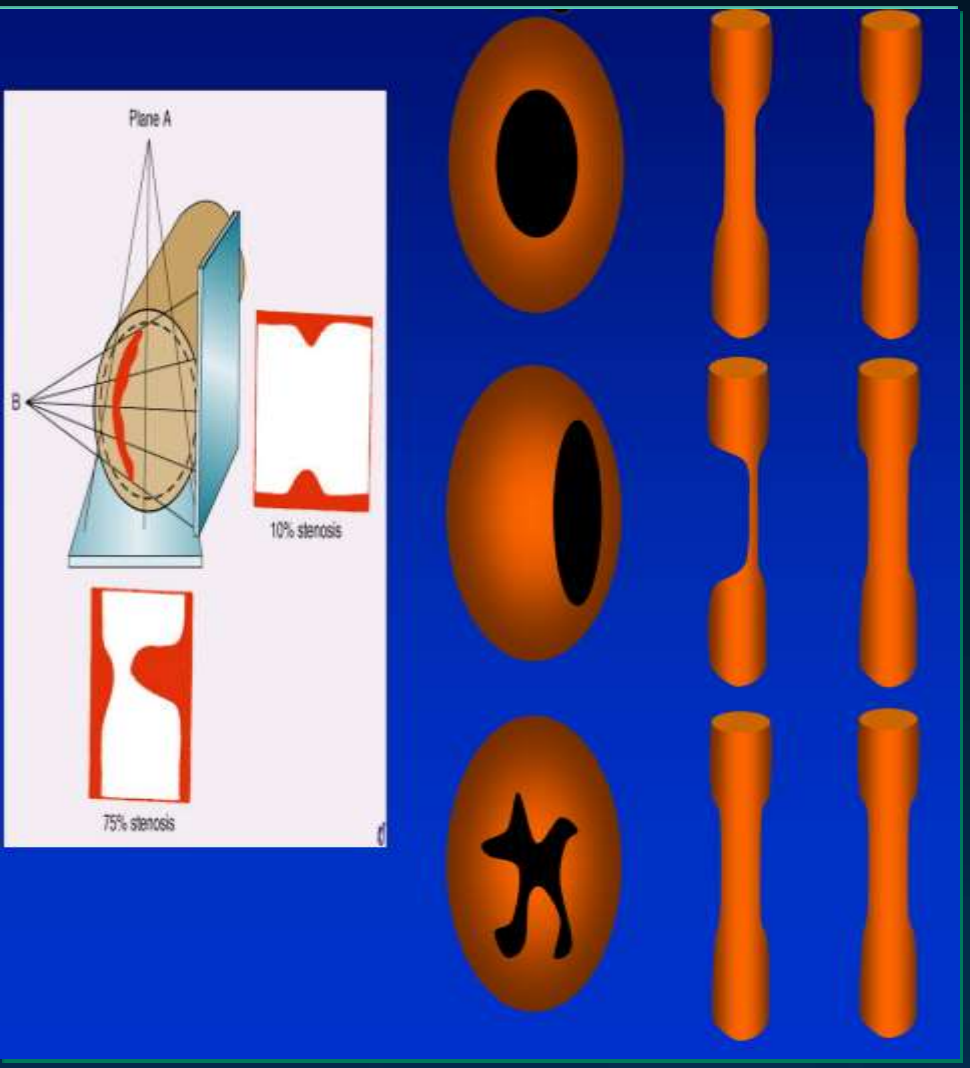


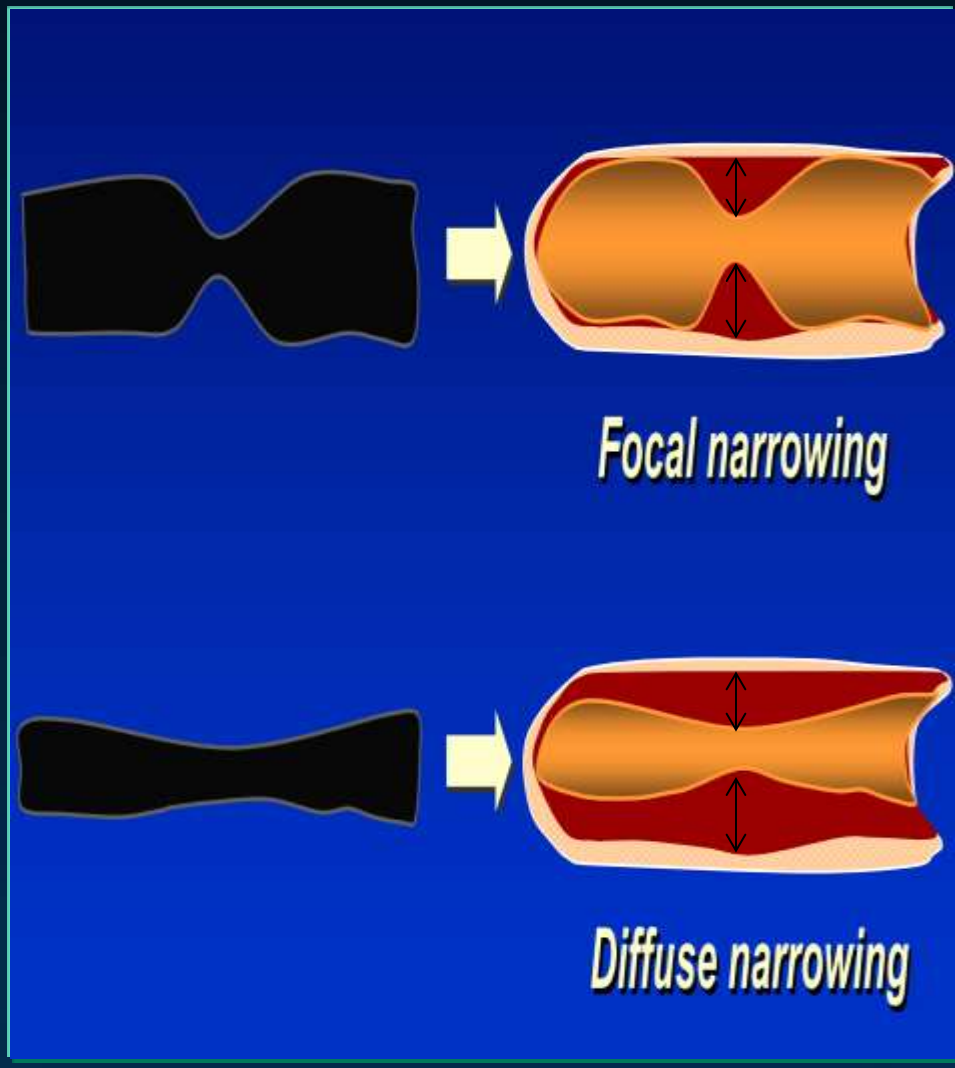
RAO CRANIAL

LAO CAUDAL

Pitfalls of CAG

Lumen-O-gram





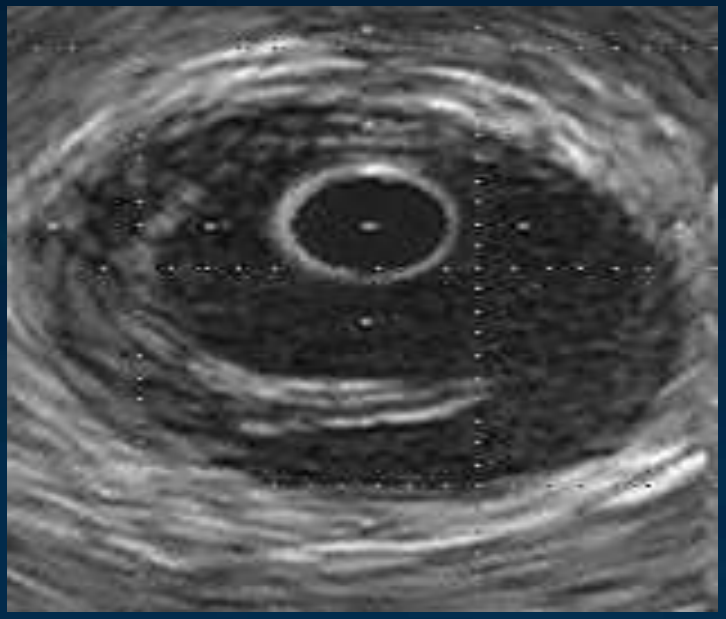
Dissection

Minor stent edge

Arc of dissection <90 degrees

Non-flow-limiting or no lumen compromise

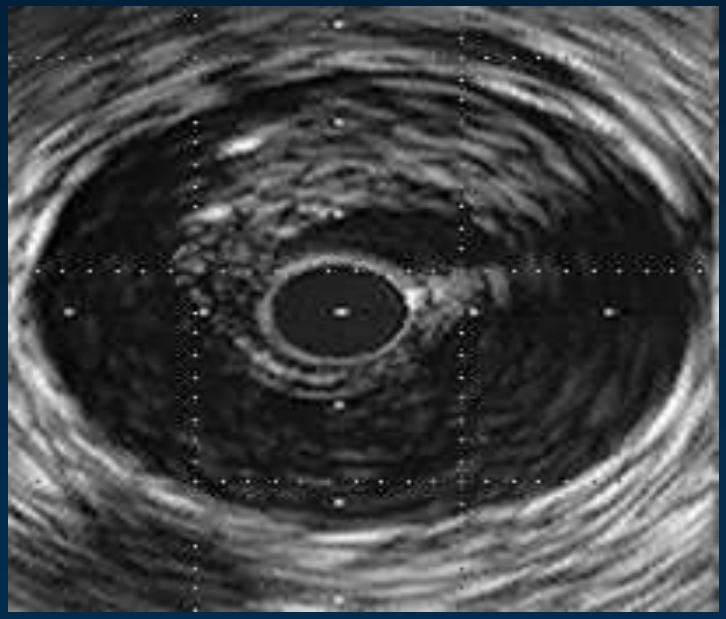
Freely mobile plaque protruding into the lumen, but not directed toward the center of the lumen



Major stent edge

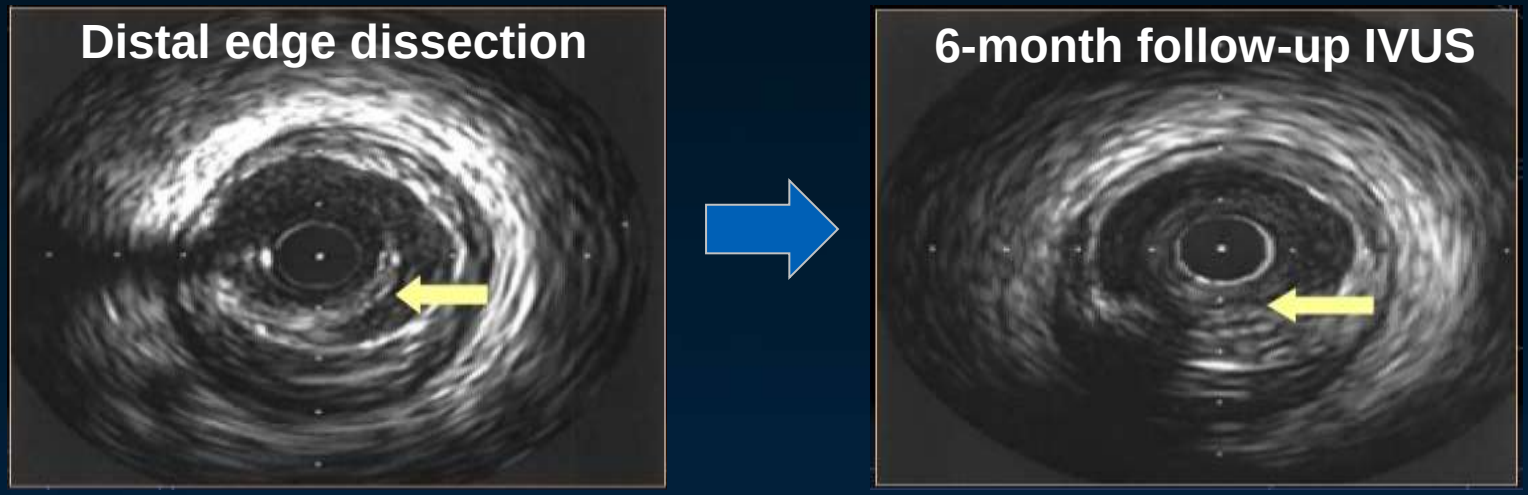
A mobile flap arc of dissection > 90 degrees

Flow-limiting or lumen compromise



Dissection

Fate of Minor Edge Dissection



Need additional Stent

CONCLUSION

CONCLUSION

1. IVUS can be extremely useful in treating various complications of PCI.

2. Viewing the hematoma to IVUS is more advantageous.

3. Diffuse lesions to a combination of FFR and IVUS is more efficient.

- IVUS/OCT if equivocal and typical symptoms
- FFR if equivocal and atypical symptoms

4. I strongly believe that IVUS guidance of complex PCI can prevent various potential complications.