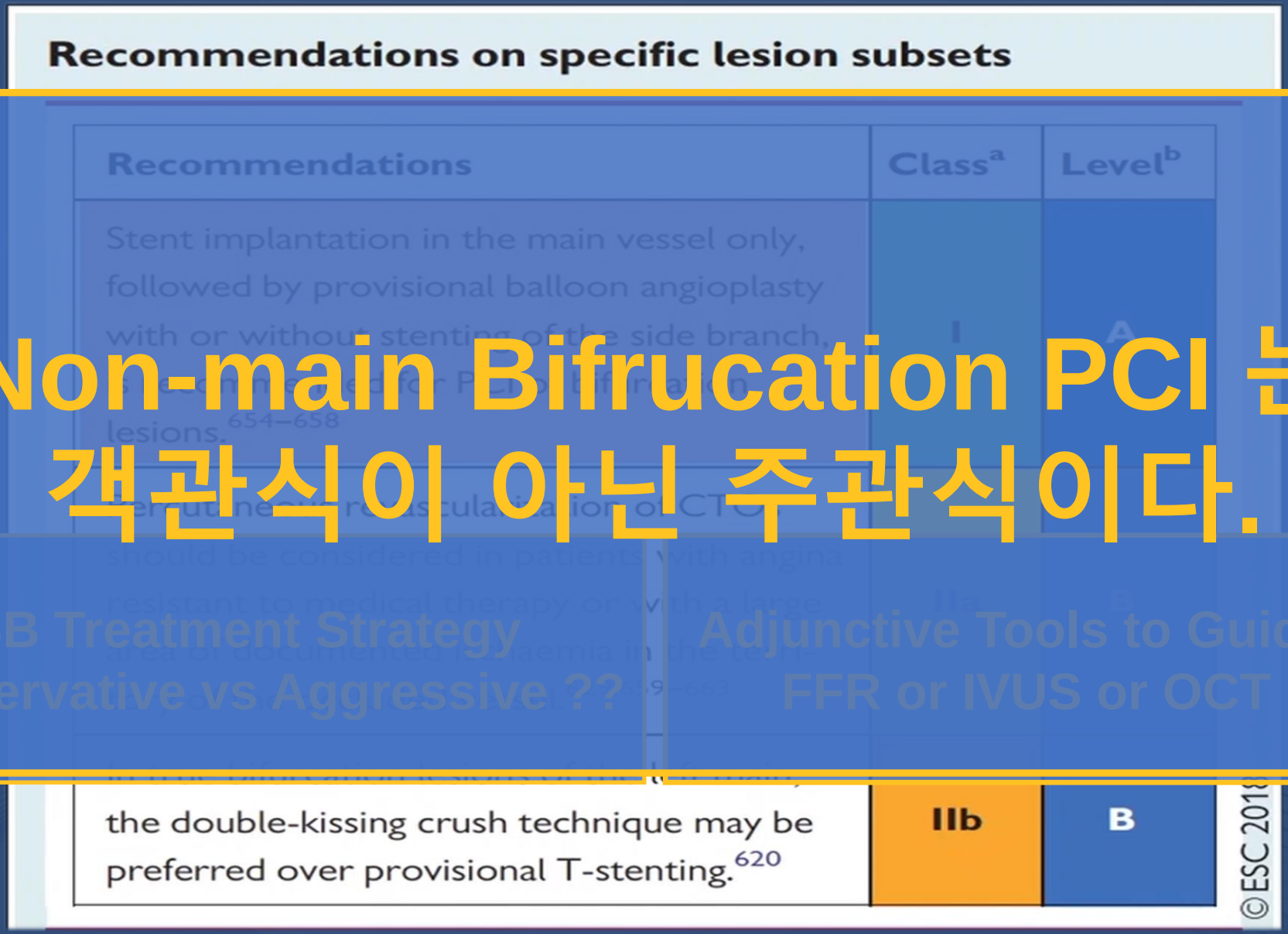
Bifurcation Treatment (Non-main)

An-sik Jeong, RT

Cardiac cath.lab, Samsung medical Center

Stent strategy : Provisional Stent vs Elective Two-Stent



Non-main Bifrucation PCI 는 객관식이 아닌 주관식이다.

SB Treatment Strategy
Conservative vs Aggressive ??

Adjunctive Tools to Guide PCI
FFR or IVUS or OCT ??

Provisional Stent (SMC operator decision's)

An-sik Jeong, RT

Cardiac cath.lab, Samsung medical Center

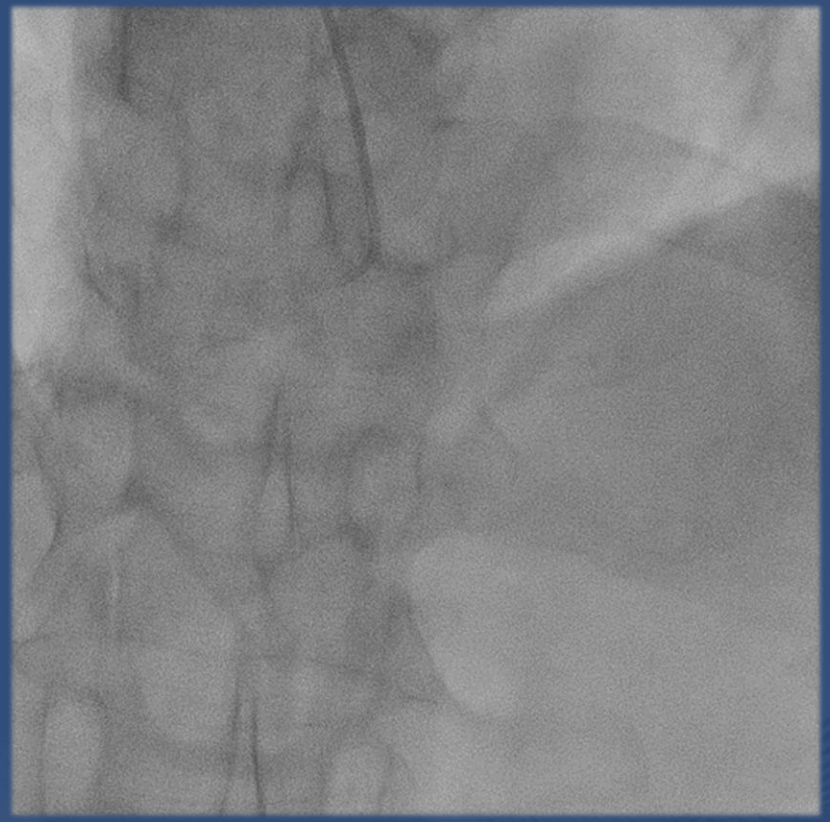
#1 CASE - M/52 (서열3위) pf.한00 교수님

학력

2006.02	서울대학교 의과대학원 의학과 (박사)
2001.02	서울대학교 의과대학원 의학과 (석사)
1996.02	서울대학교 의과대학 의학과 졸업 (의학사)

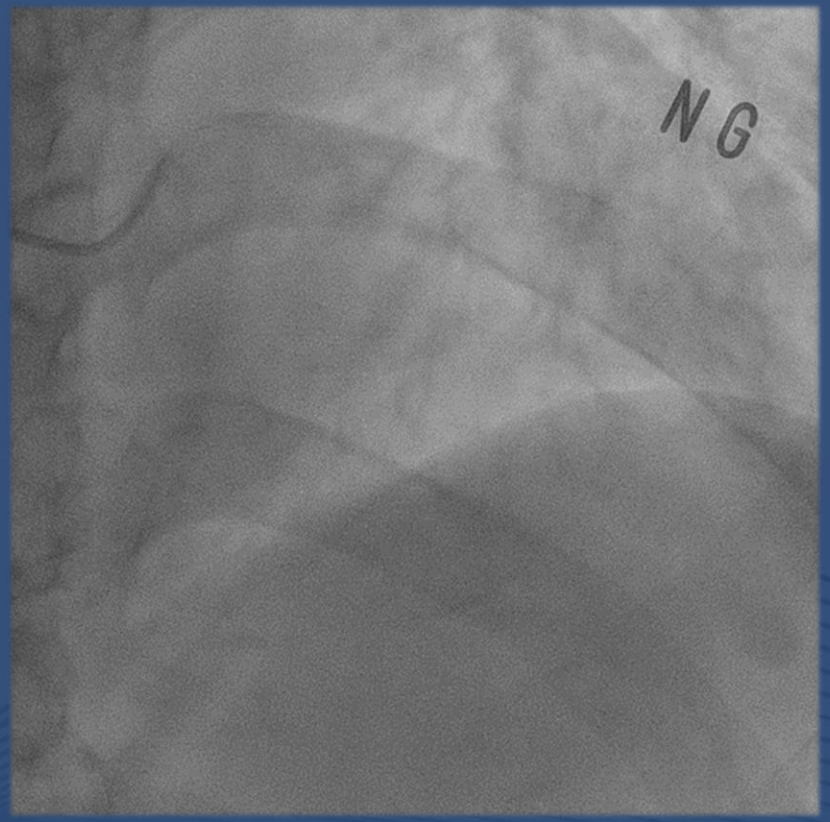
경력

2021.12 ~ 현재	삼성서울병원 심장뇌혈관병원 운영지원실장
2018.04 ~ 현재	성균관의대 삼성서울병원 내과학 교수
2012.04 ~ 2018.03	성균관의대 삼성서울병원 내과학 부교수
2008.03 ~ 2012.03	성균관의대 삼성서울병원 내과 조교수
2010.08 ~ 2012.01	Stanford University Medical Center 연수
2007.03 ~ 2008.02	삼성서울병원 순환기내과 임상조교수
2006.03 ~ 2007.02	삼성서울병원 순환기내과 임상강사
2006.10	순환기내과 분과전문의 자격 취득
2004.05 ~ 2006.02	서울대학교병원 순환기내과 전임의
2001.04 ~ 2004.04	육군 대위 (군의관)
1997.03 ~ 2001.02	서울대학교병원 내과 레지던트 과정 수료
2001.01	내과전문의 자격 취득
1996.03 ~ 1997.02	서울대학교병원 인턴과정 수료

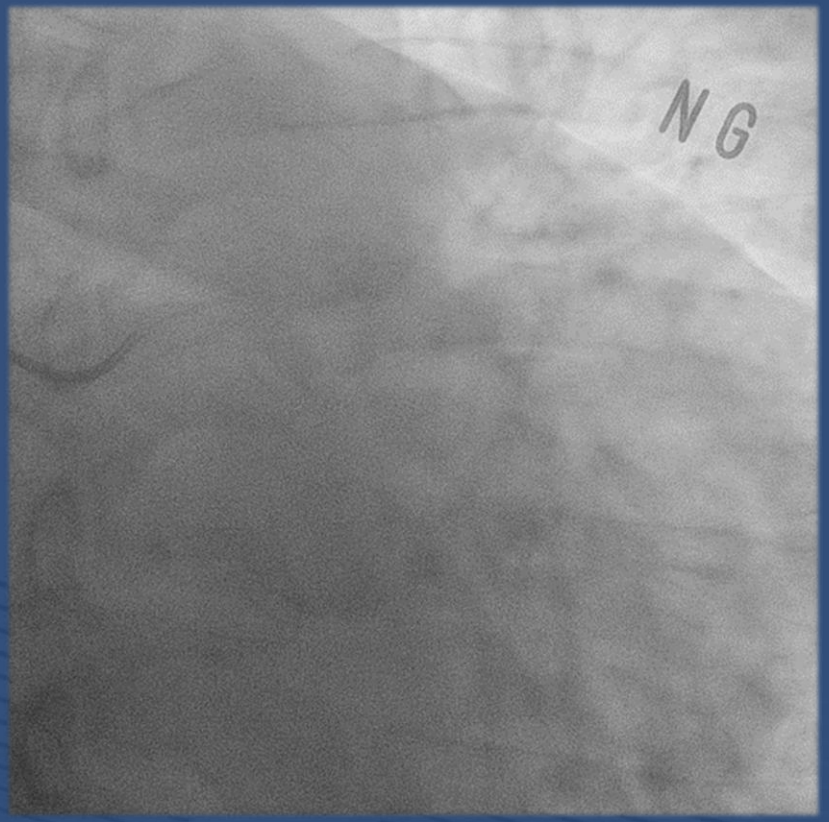


RCA Angio

PL : 80% diffuse stenosis



AP CRA

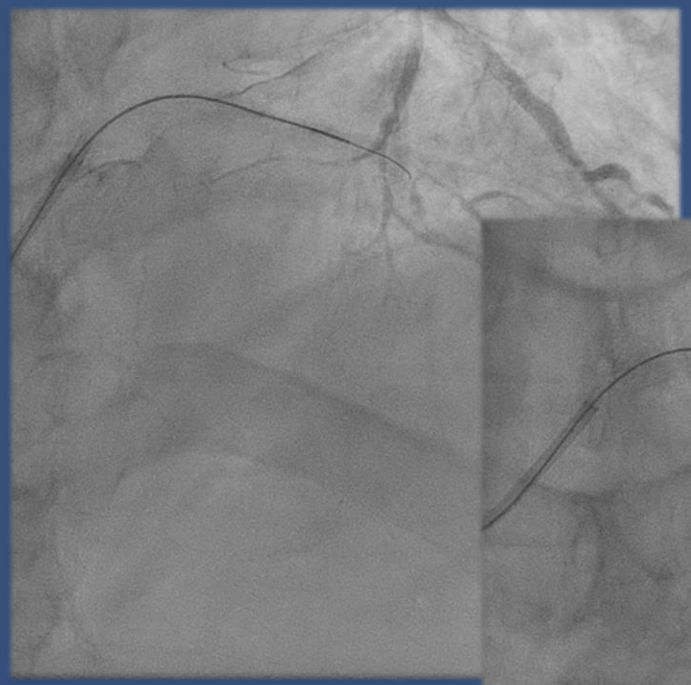


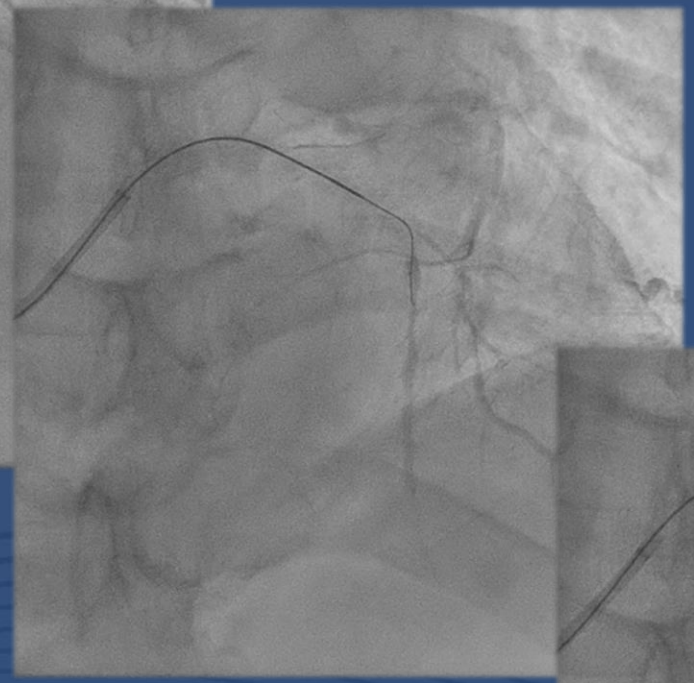
AP CAU

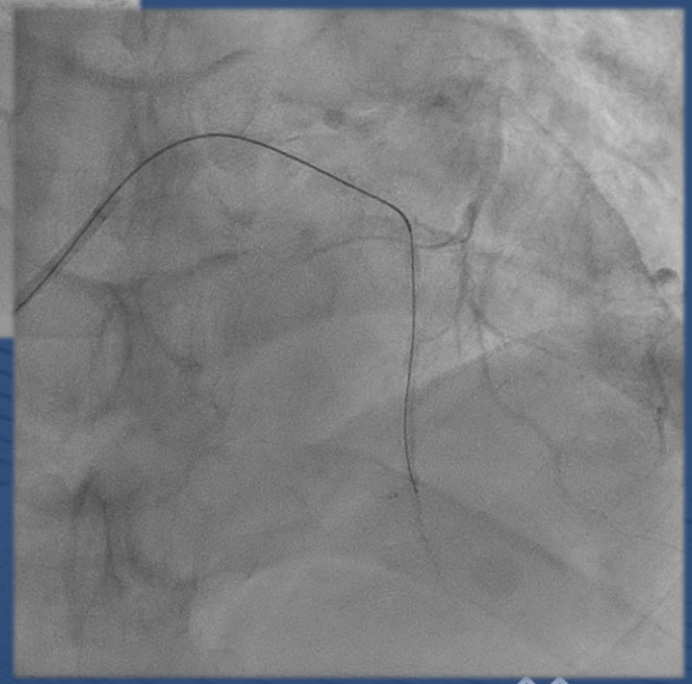
LAD prox : Chronic total occlusion

OM : 90% segmental stenosis

RI : 70% segmental stenosis







OM STENT & RI DEB

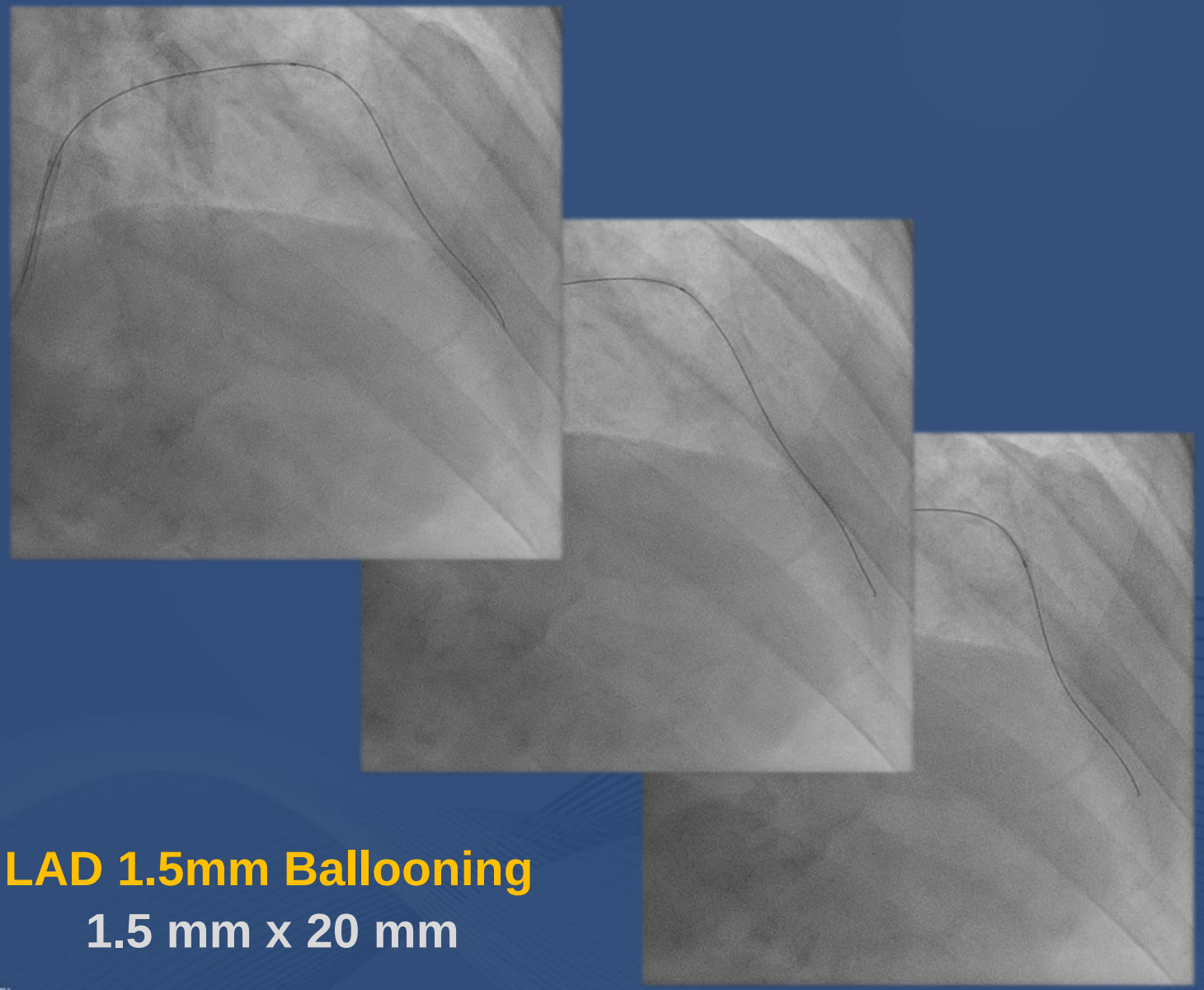
OM : 2.75 mm x 24 mm (Synergy)

RI : 2.5 mm x 20 mm (DEB)

LAD wire crossing

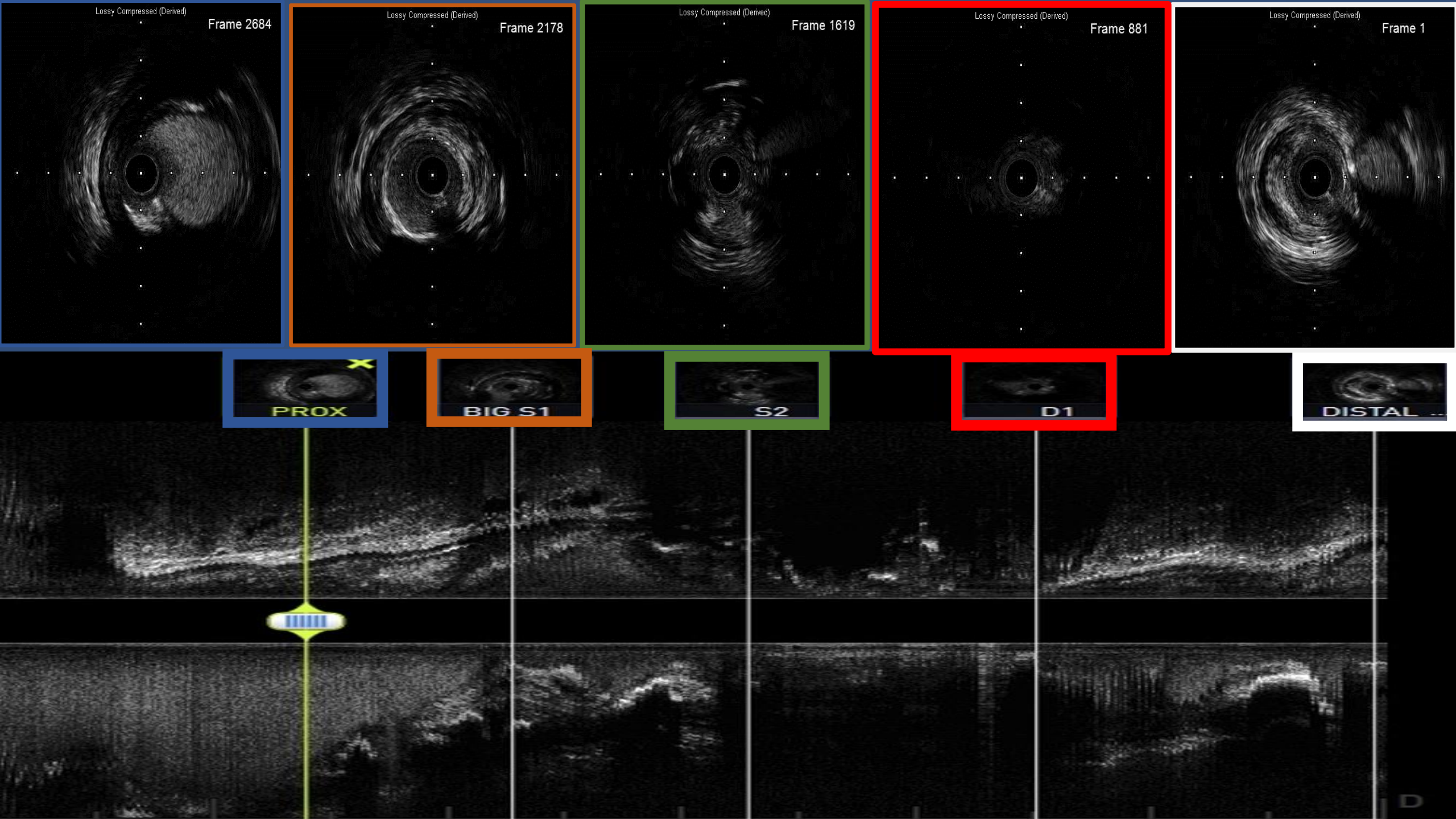
Corsair pro XS + Gaia 1st

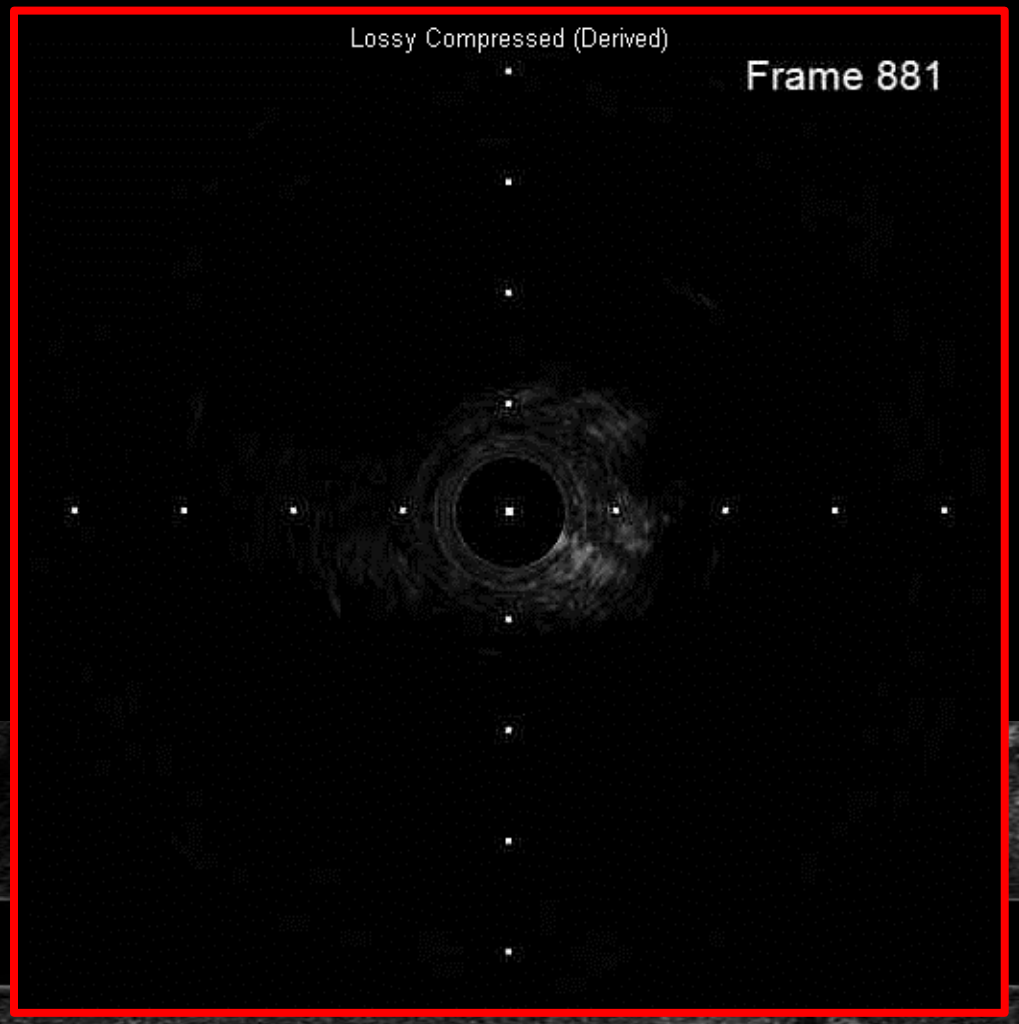
CVRF



LAD 1.5mm Ballooning
1.5 mm x 20 mm

Wire exchange & IVUS (+)
Runthrough


Lossy Compressed (Derived)
Frame 2684
Lossy Compressed (Derived)
Frame 2178
Lossy Compressed (Derived)
Frame 1619
Lossy Compressed (Derived)
Frame 881
Lossy Compressed (Derived)
Frame 1
PROX
BIG S1
S2
D1
DISTAL

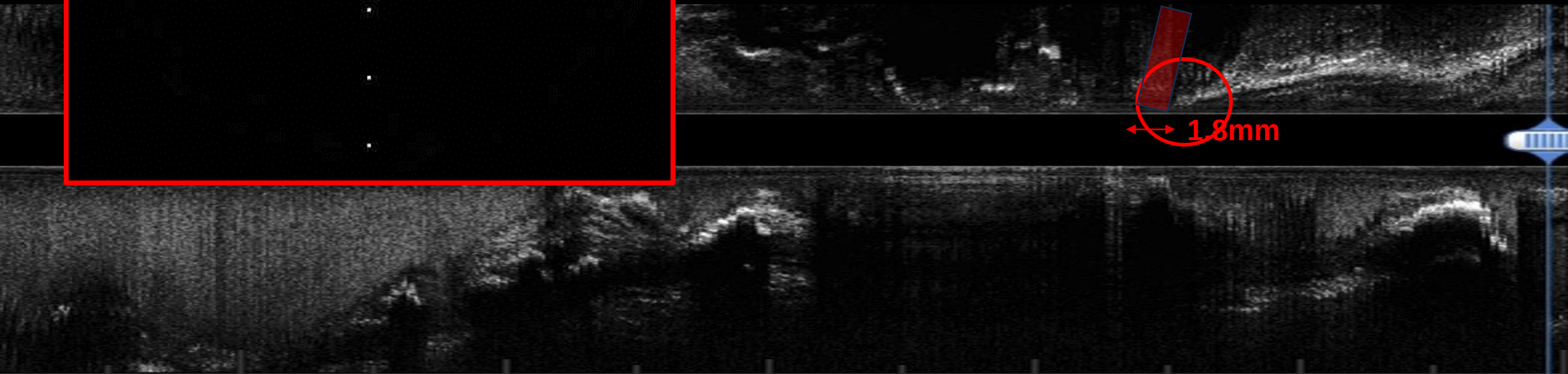


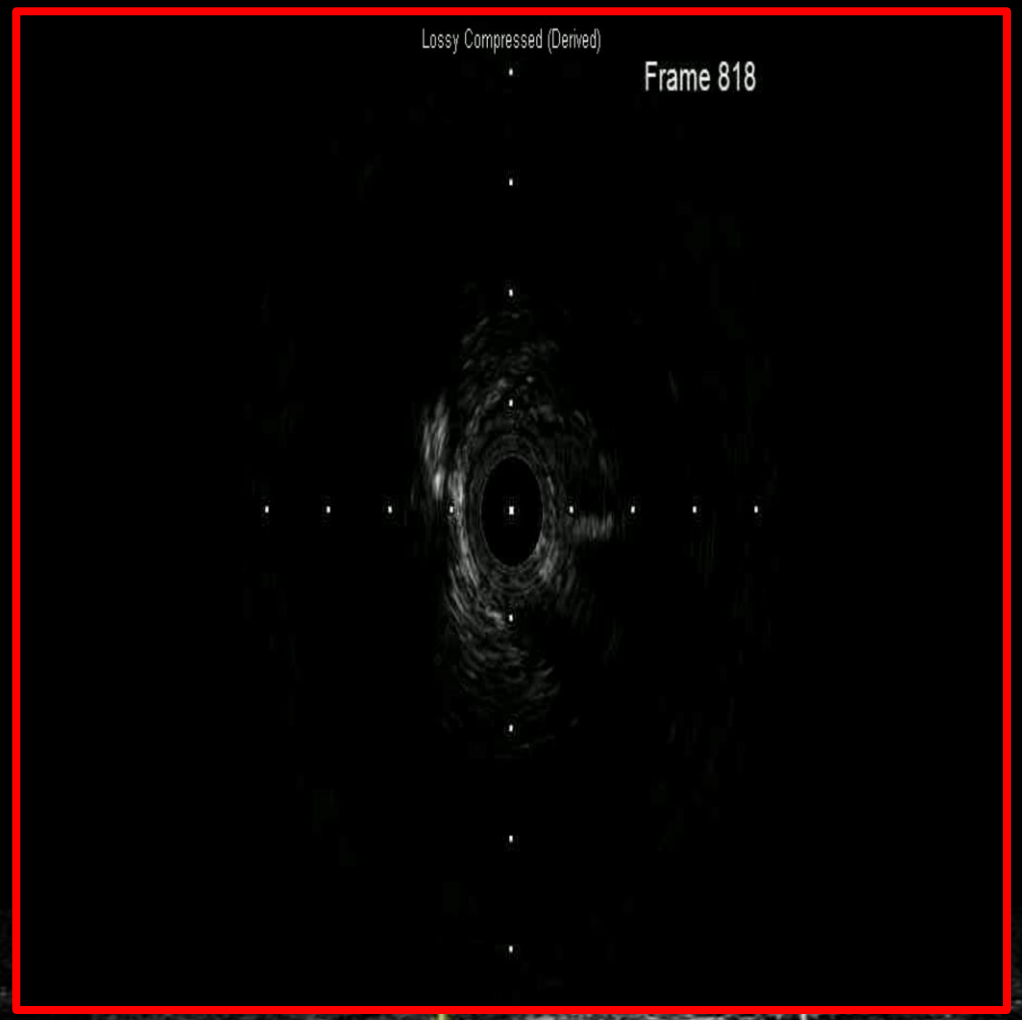
1. Stenosis of SB ostium (DS ≥ 50%) - X

2. Short length of CT-BT (≤ 1.7mm) - X

3. Narrow carina angle (≤ 50°) - X

No Carina shift ? No SB Occlusion ?



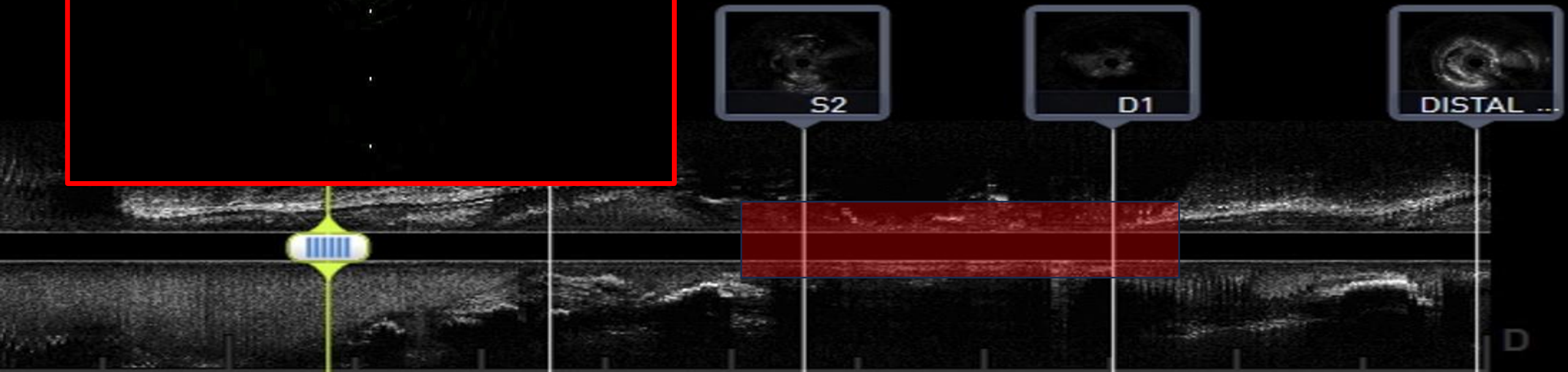


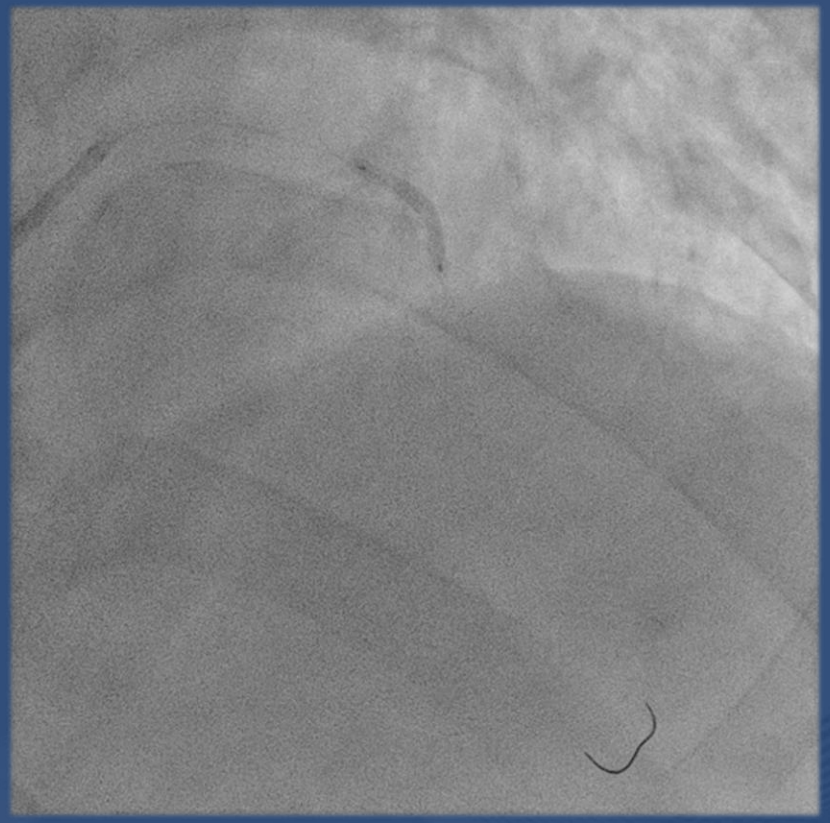
1. Stenosis of SB ostium (DS ≥ 50%) - X

2. Stenosis of prox MV (DS ≥ 50%) - O

3. Lipid-rich plaque of prox MV (≥ 180°) - O

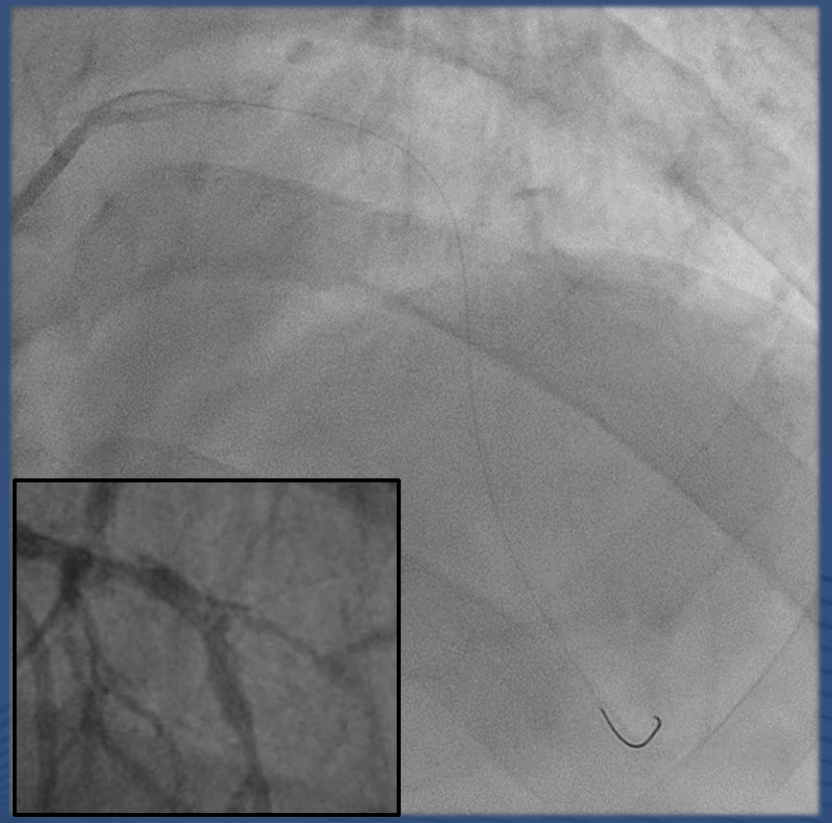
Maybe Plaque shift & SB Occlusion ..



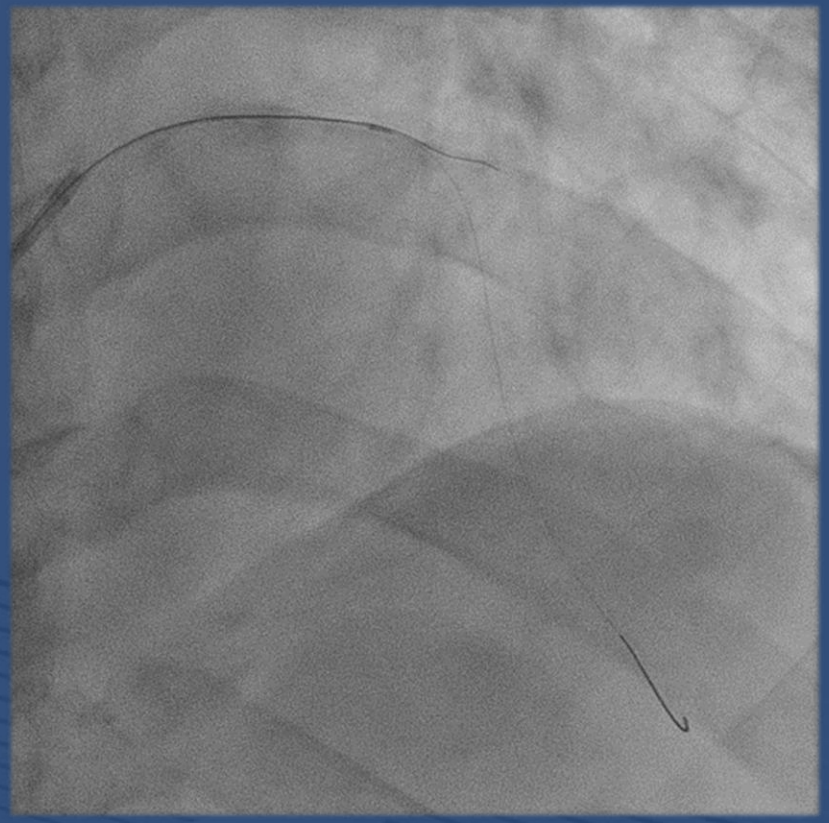


LAD Ballooning

2.5 mm x 20 mm

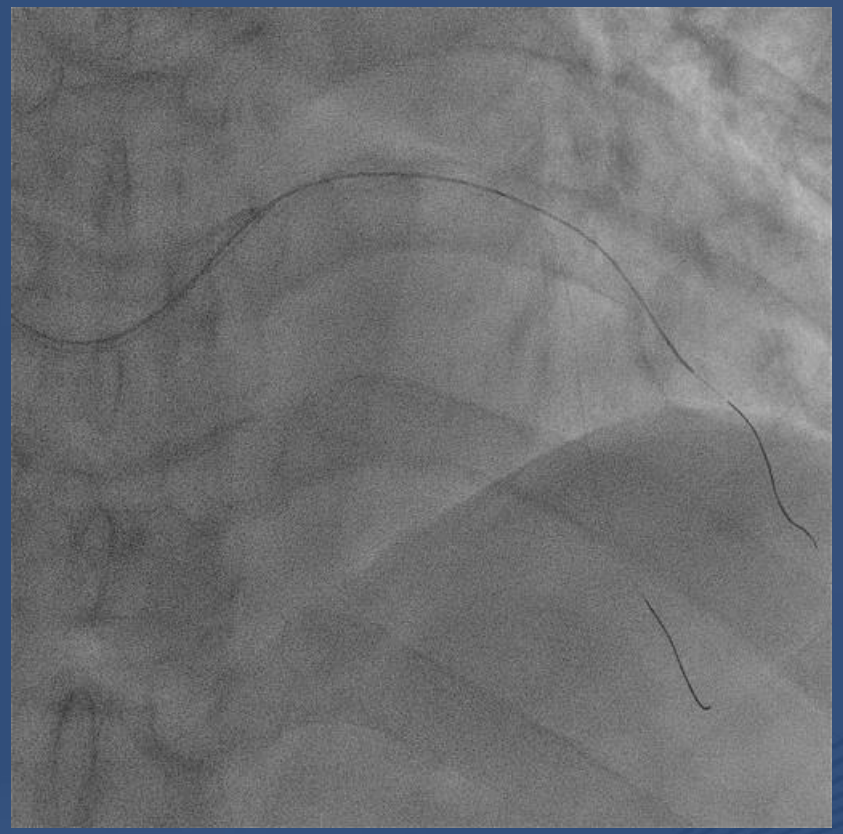


Post LAD Balloon



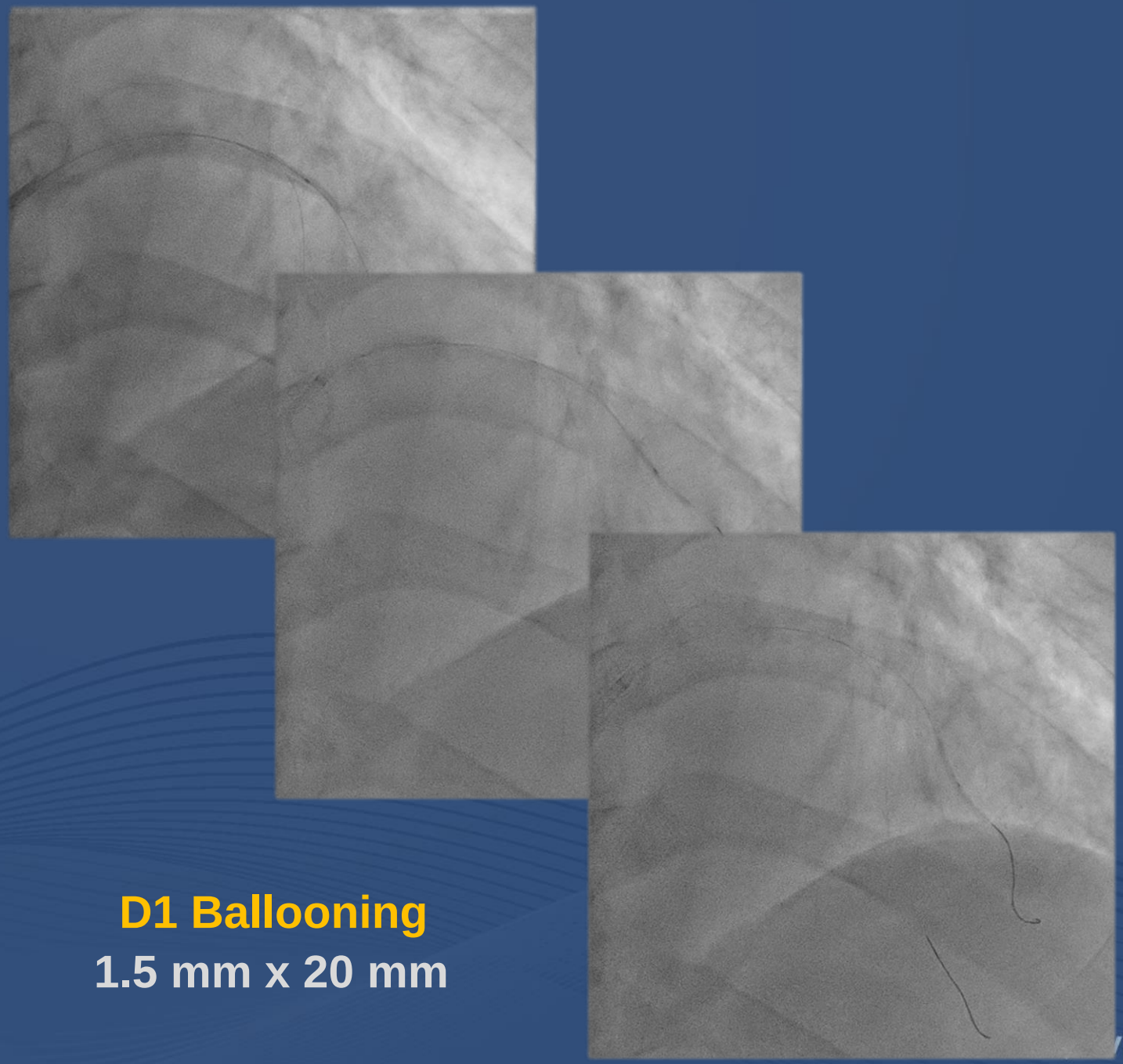
D1 wiring

SASUKE + Fielder XT-R



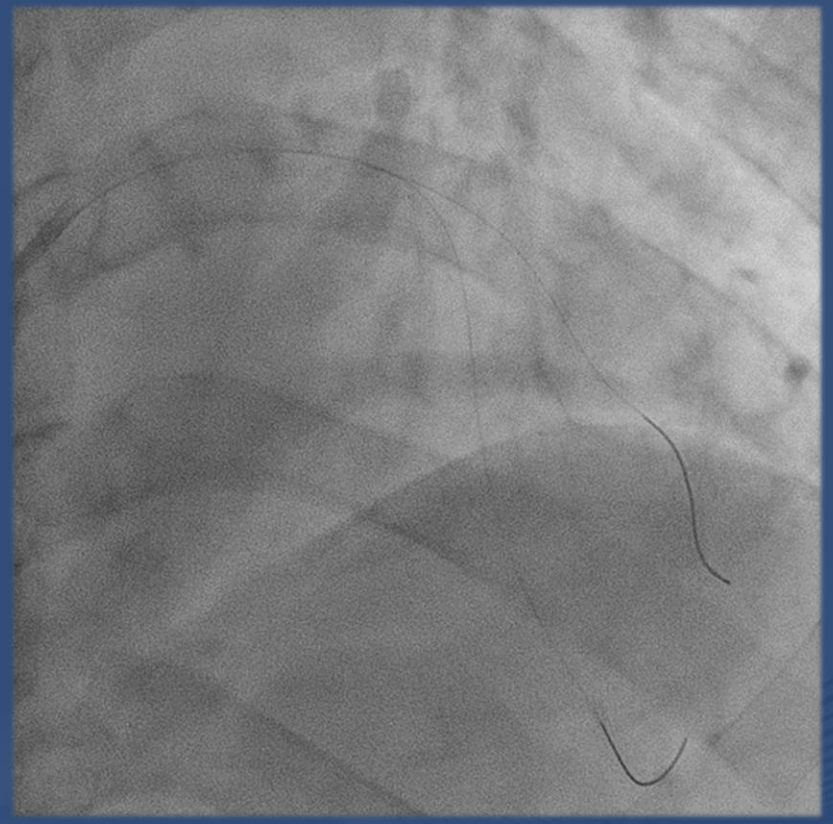
D1 wire exchange

Sion blue ES

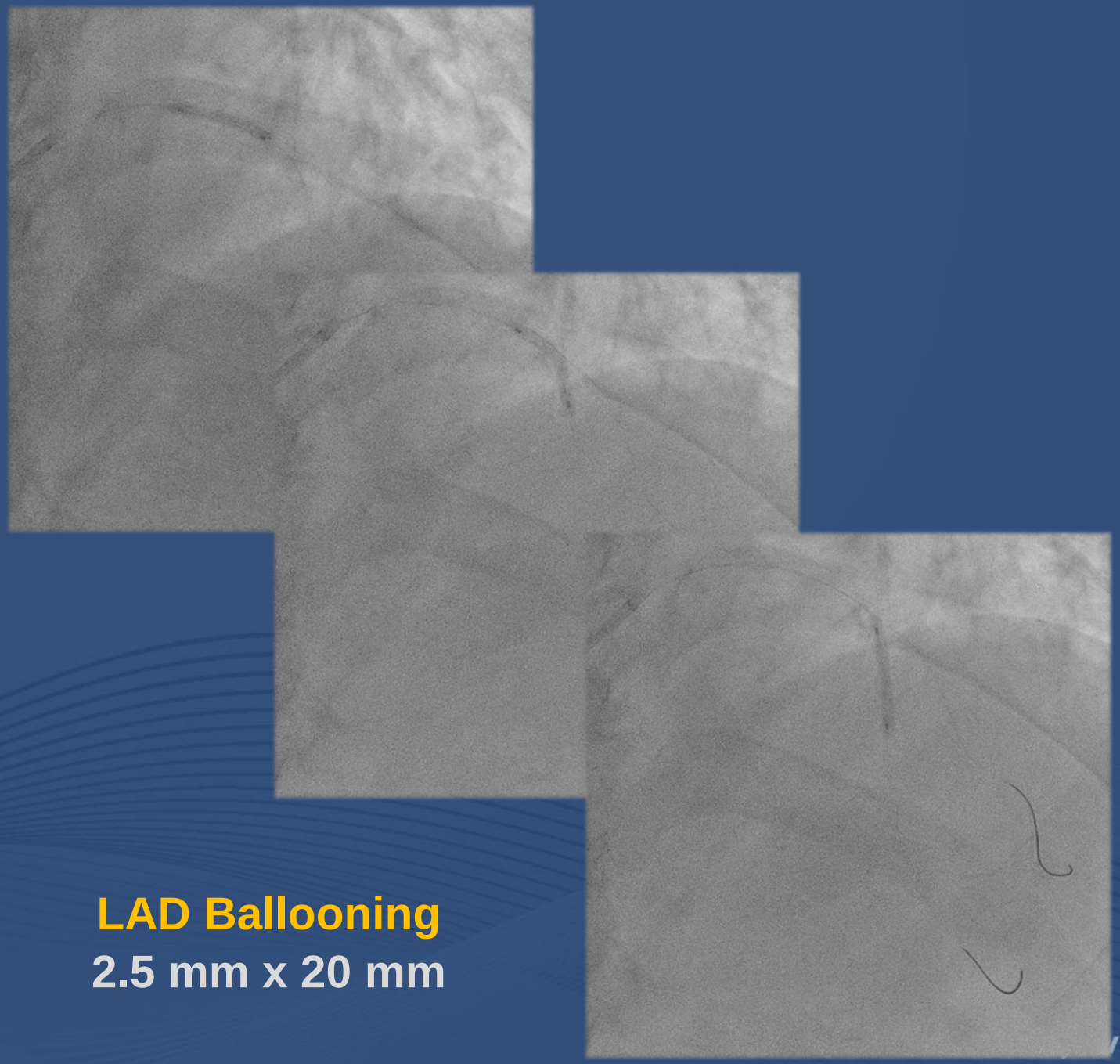


D1 Ballooning

1.5 mm x 20 mm

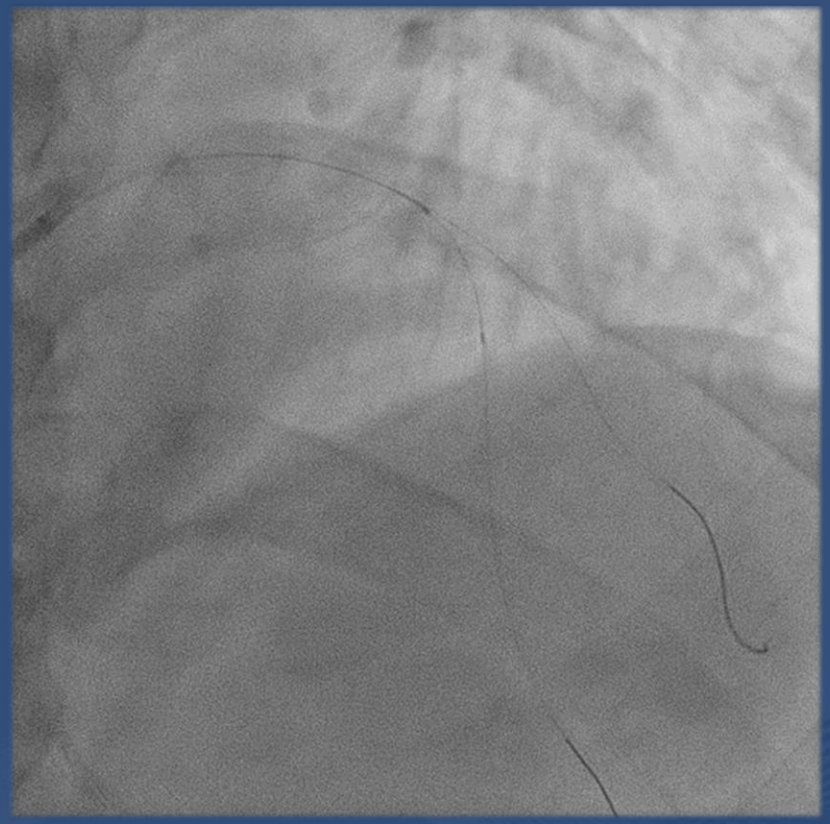


Post D1 Balloon

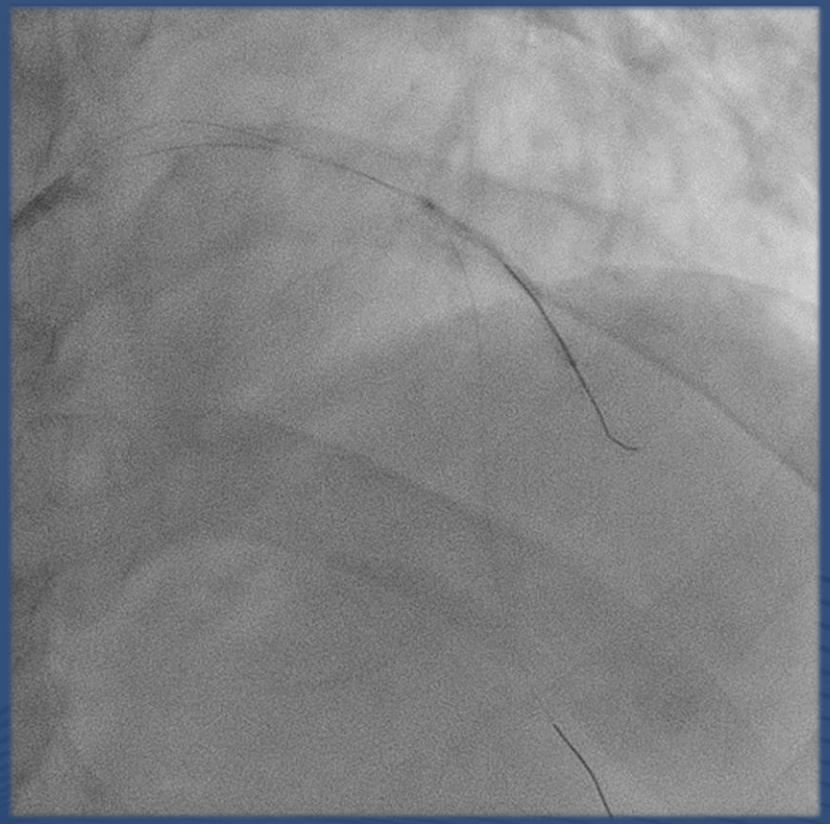


LAD Ballooning

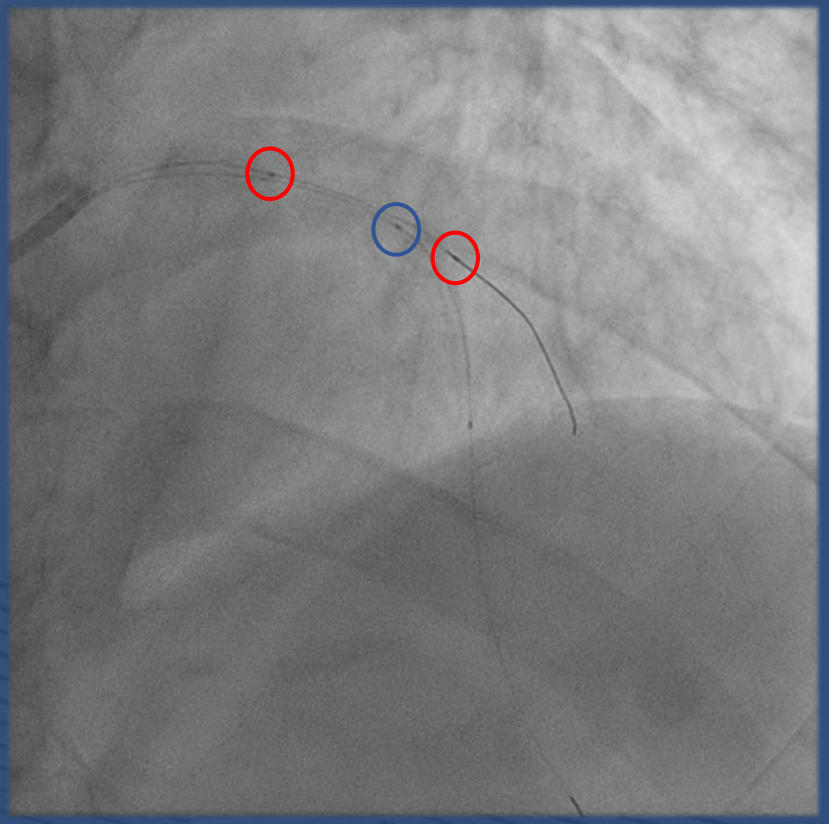
2.5 mm x 20 mm



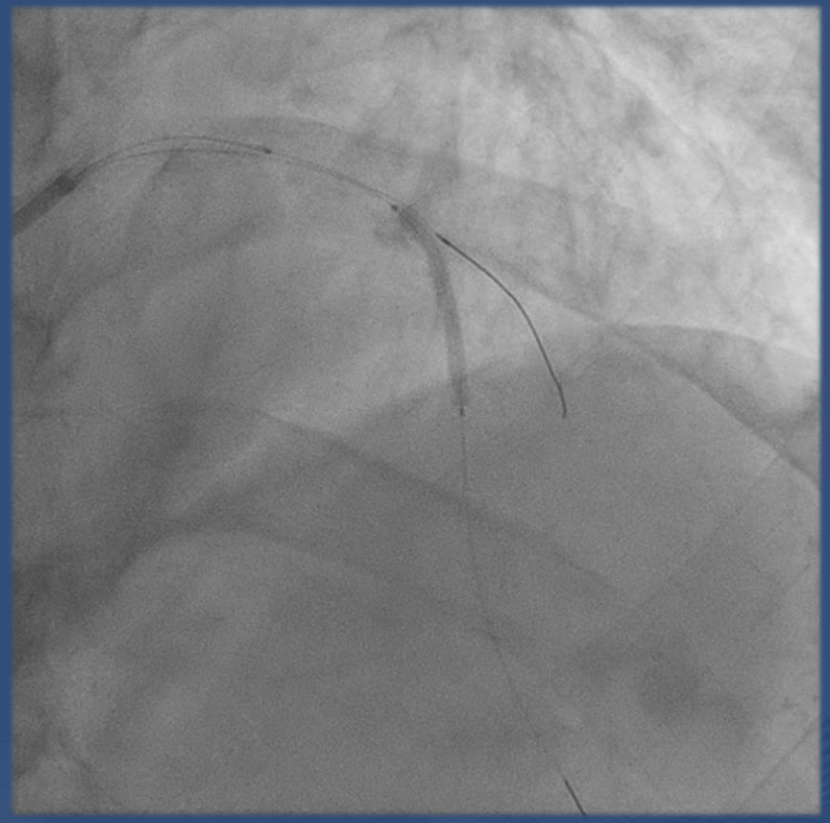
Post LAD Balloon



D1 DEB
2.25 mm x 30 mm
Delivery time : 35 sec
Inflation time : 60 sec

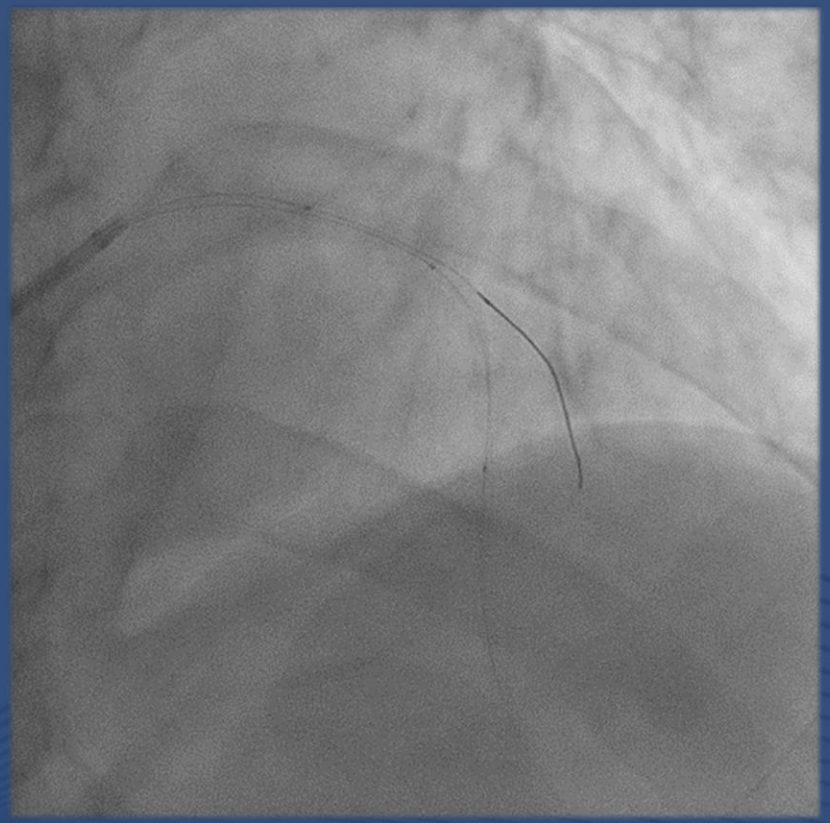


LAD Stent landing &
Jailed Balloon Tec.
2.5 mm x 28 mm (Genoss DES)

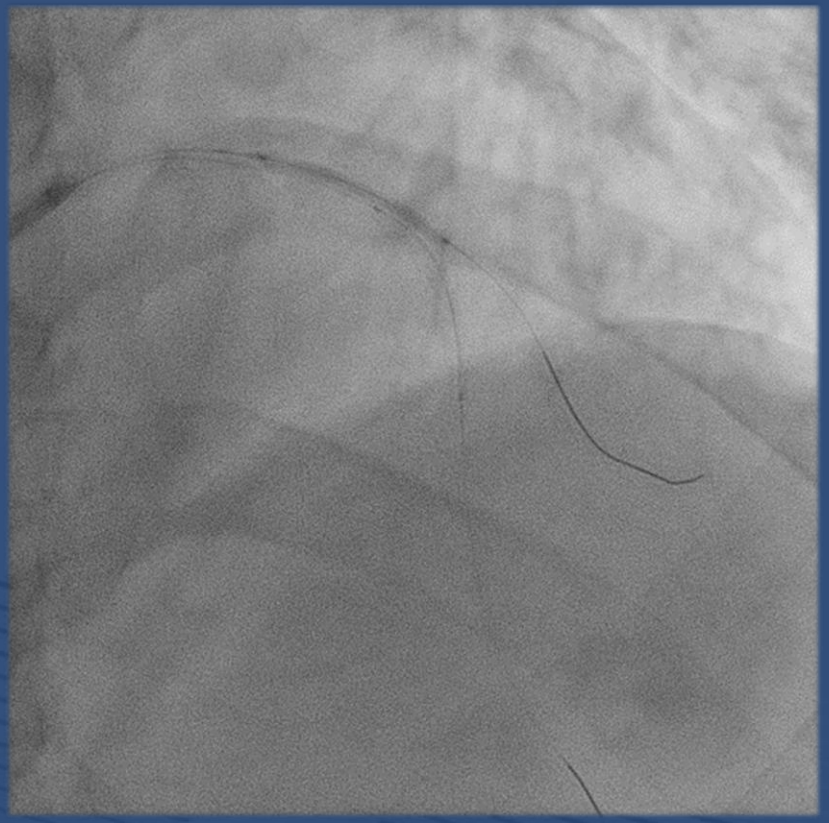


mLAD Stent Inflation

2.5 mm x 28 mm (9atm)

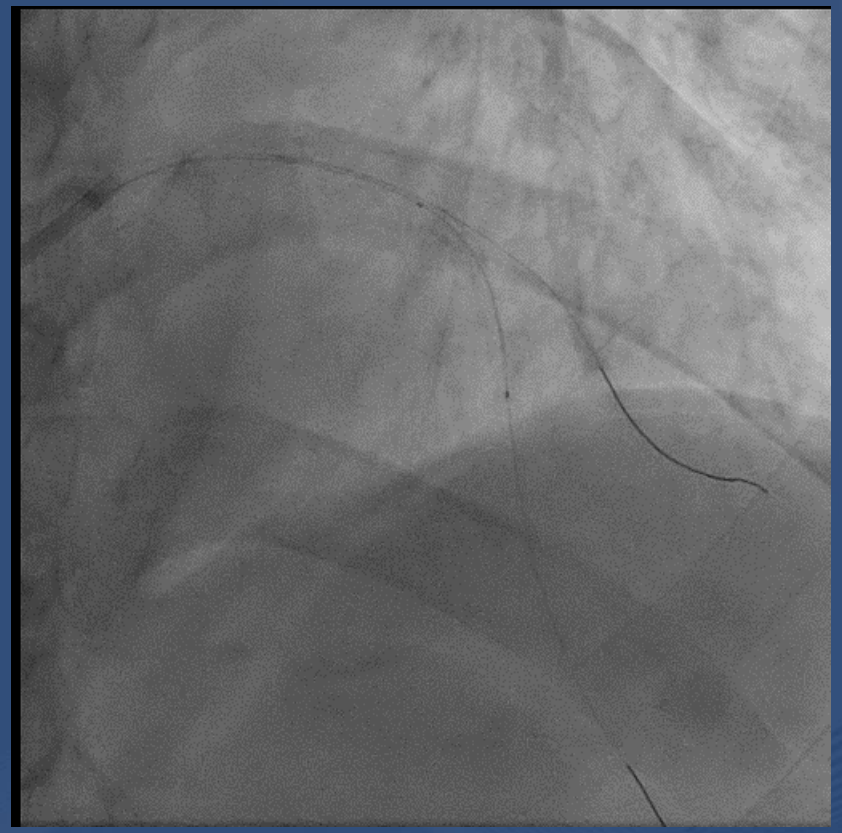


Post LAD Stent



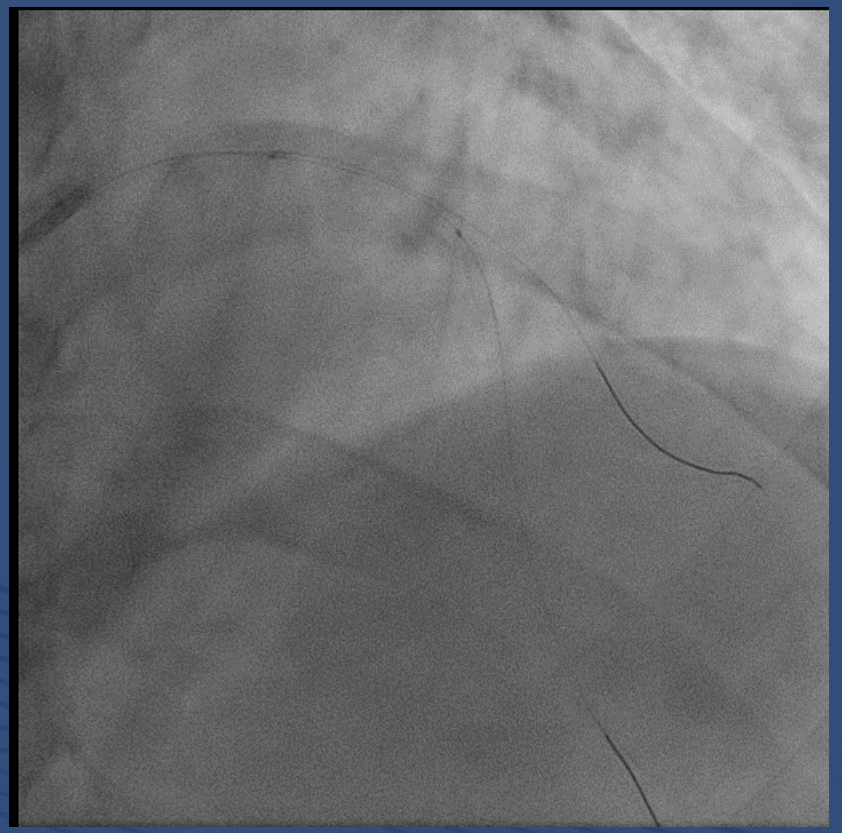
Jailed Balloon inflation

2.25 mm x 20 mm (4atm)

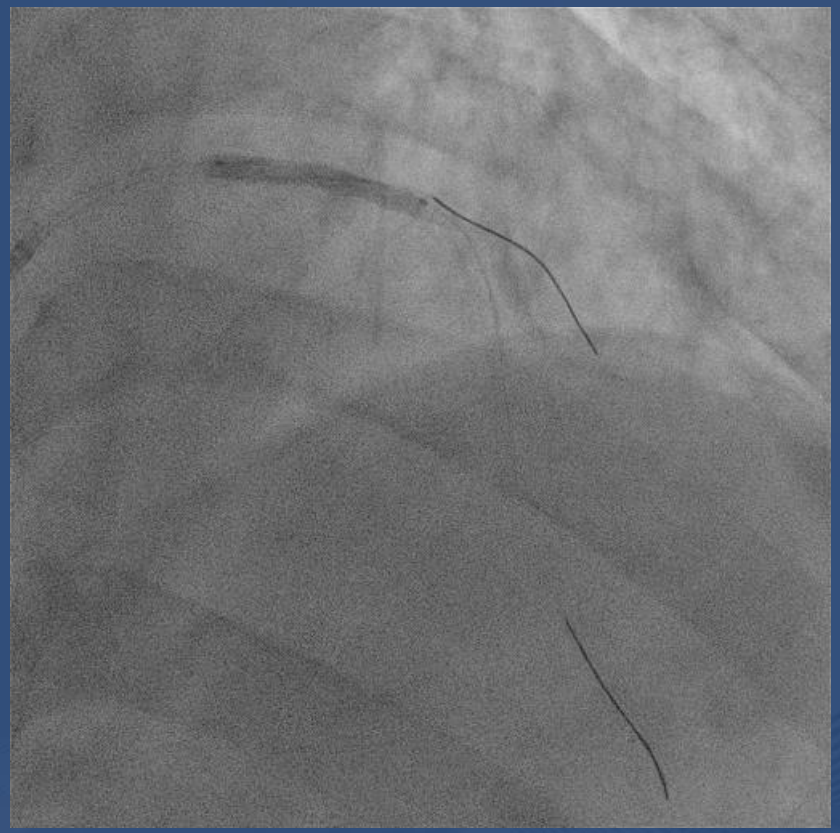


Post D1 Balloon

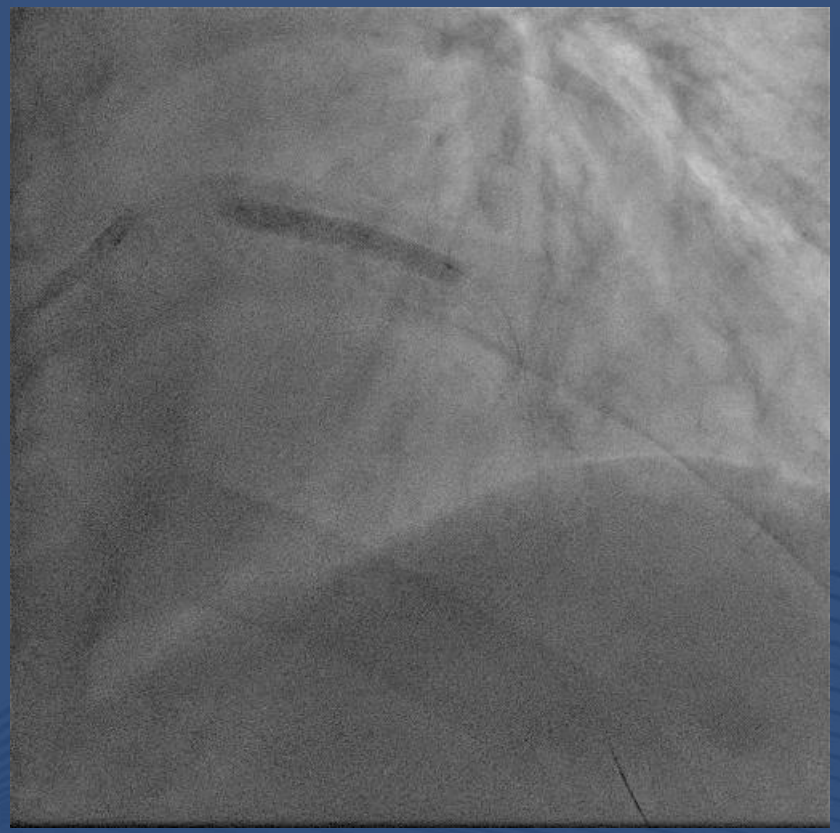
Stent Balloon High Inflation
2.5 mm x 28 mm (12atm)



Post LAD High Inflation

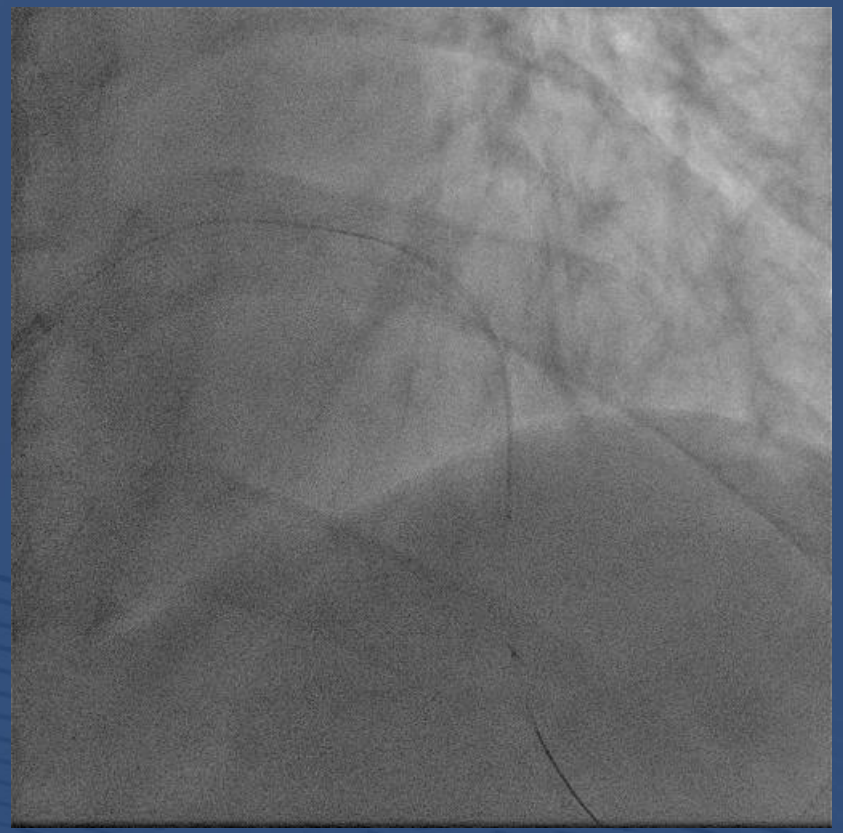


POT & pLAD ballooning

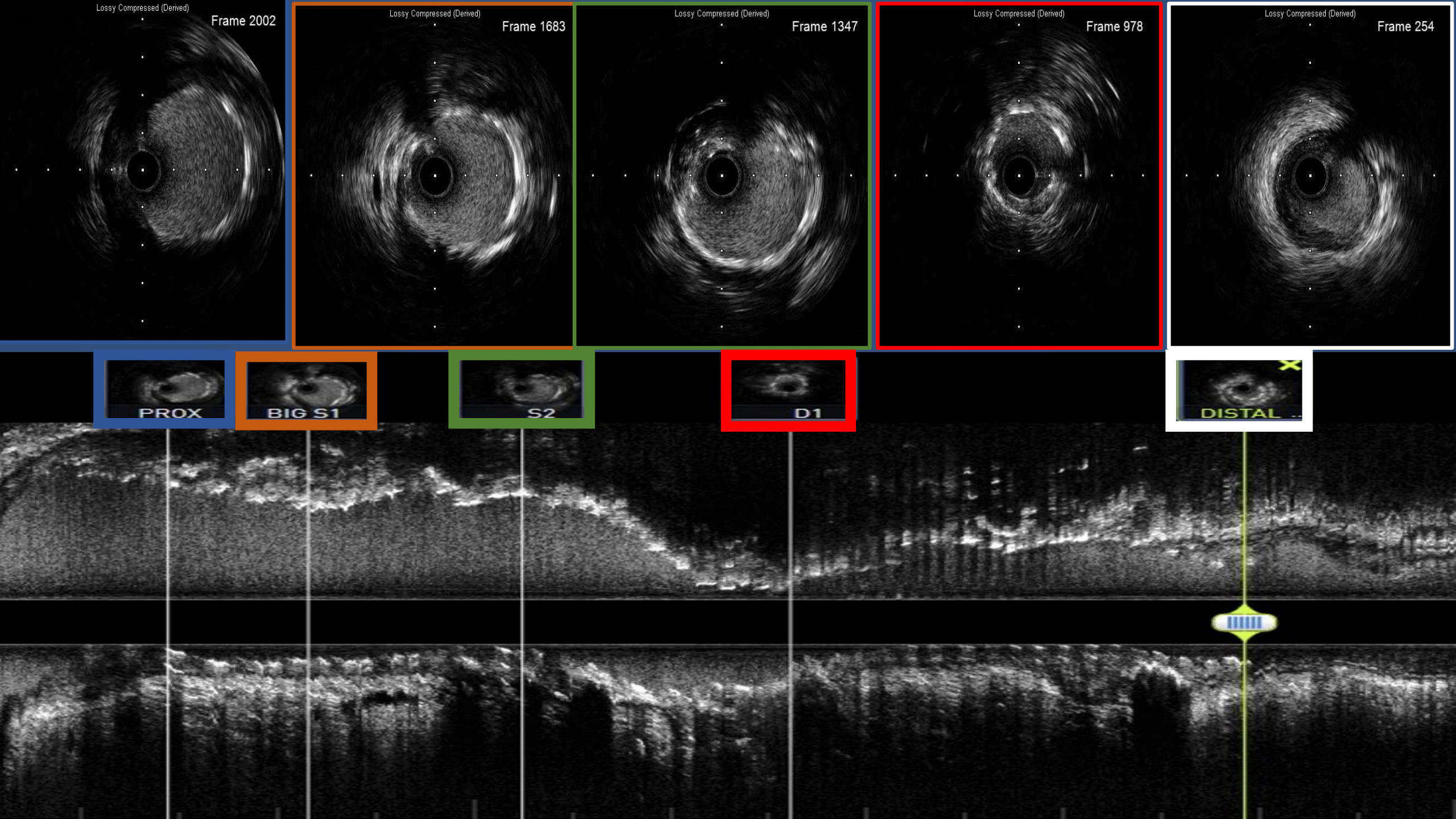


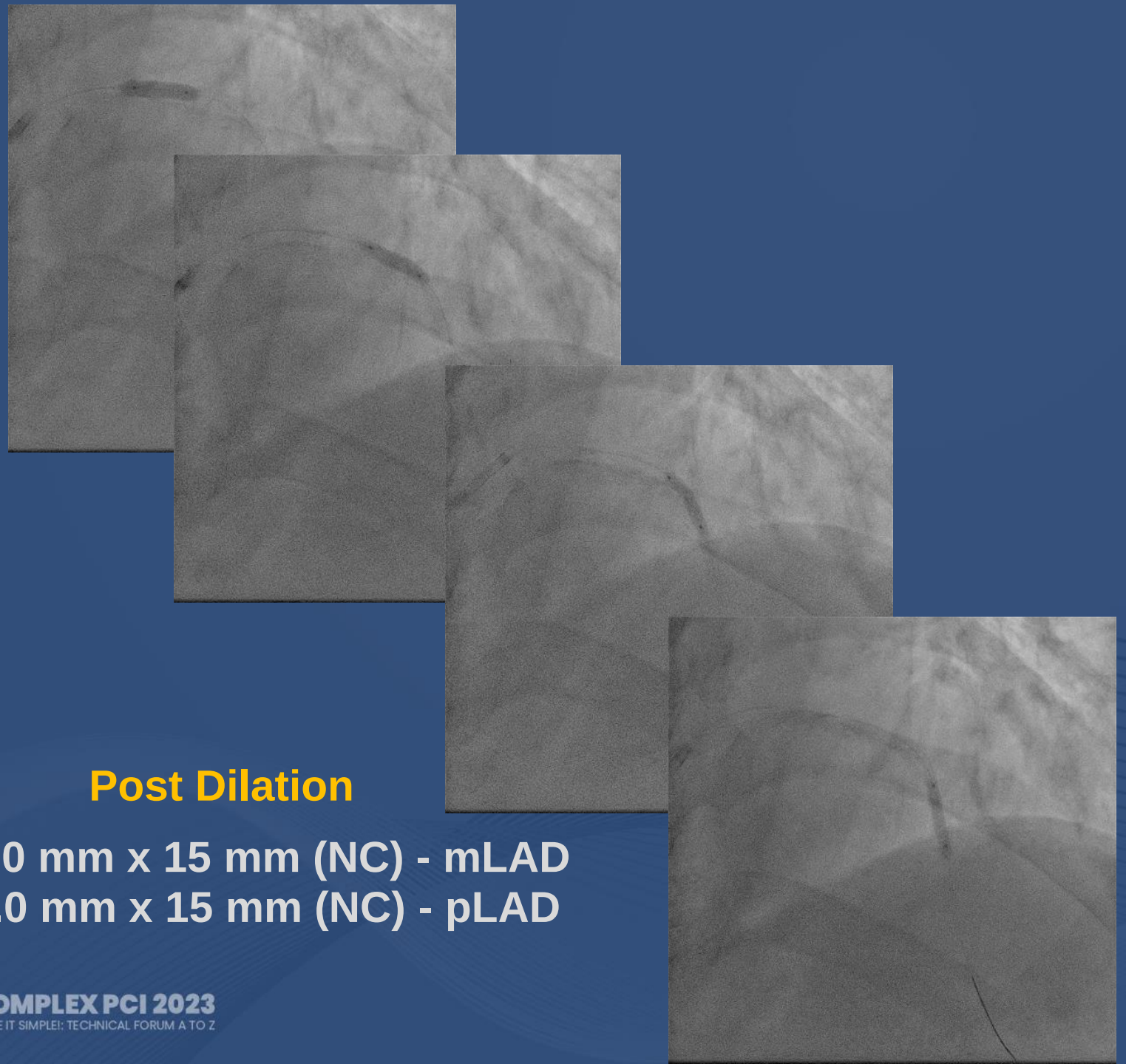
pLAD Stent Inflation

3.5 mm x 28 mm (Genoss DES)



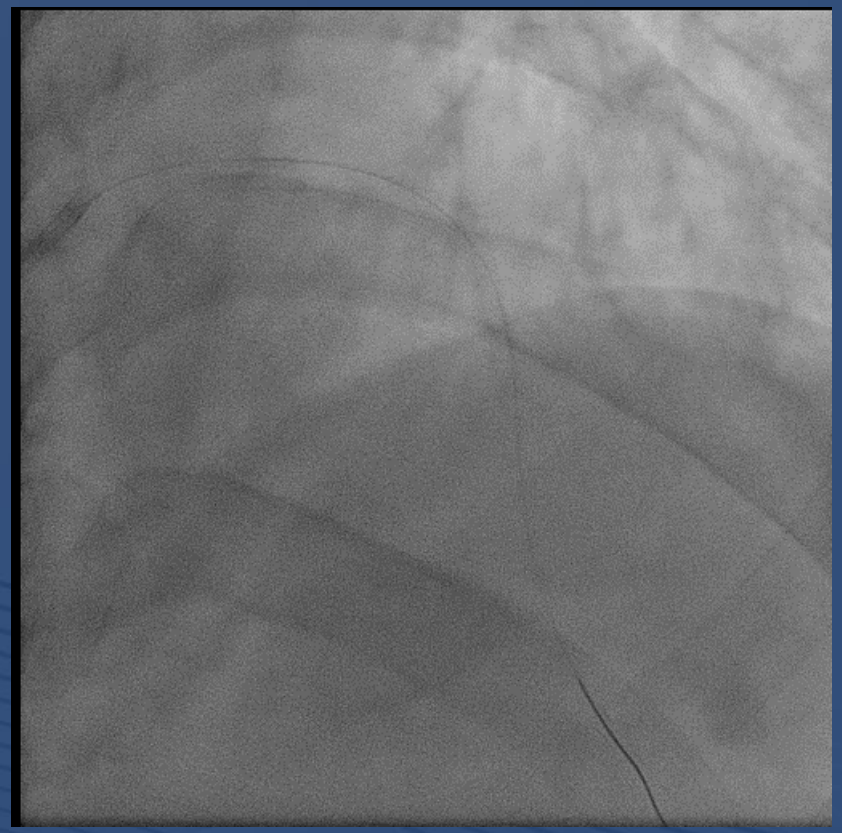
IVUS (+)


Lossy Compressed (Derived)
Frame 2002
Lossy Compressed (Derived)
Frame 1683
Lossy Compressed (Derived)
Frame 1347
Lossy Compressed (Derived)
Frame 978
Lossy Compressed (Derived)
Frame 254
PROX
BIG S1
S2
D1
DISTAL

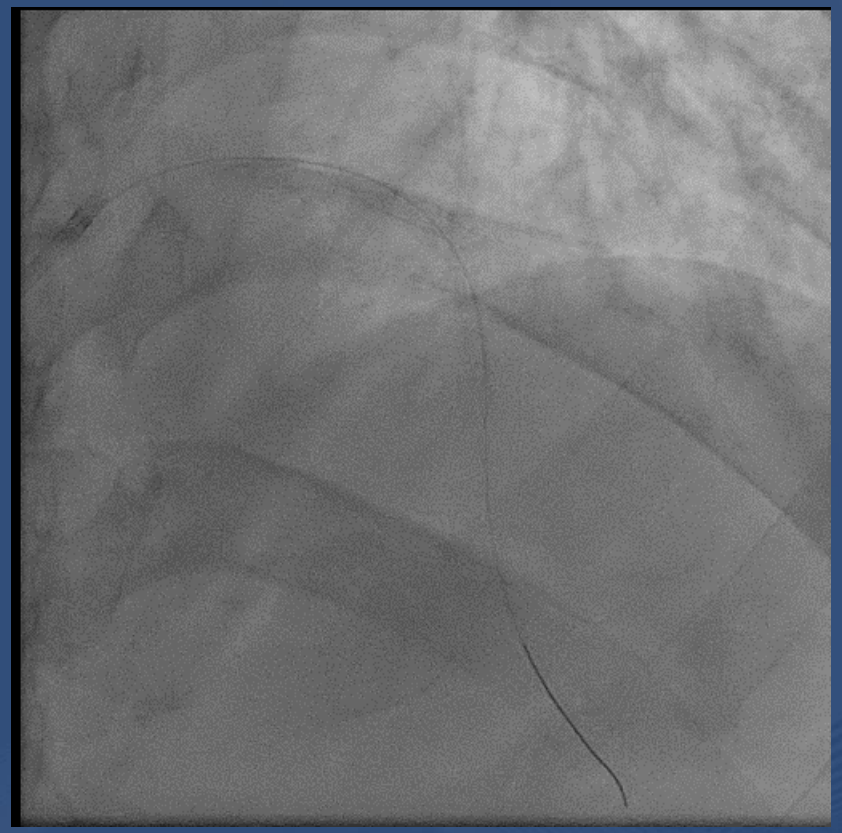


Post Dilation

3.0 mm x 15 mm (NC) - mLAD
4.0 mm x 15 mm (NC) - pLAD



Post NC Balloon

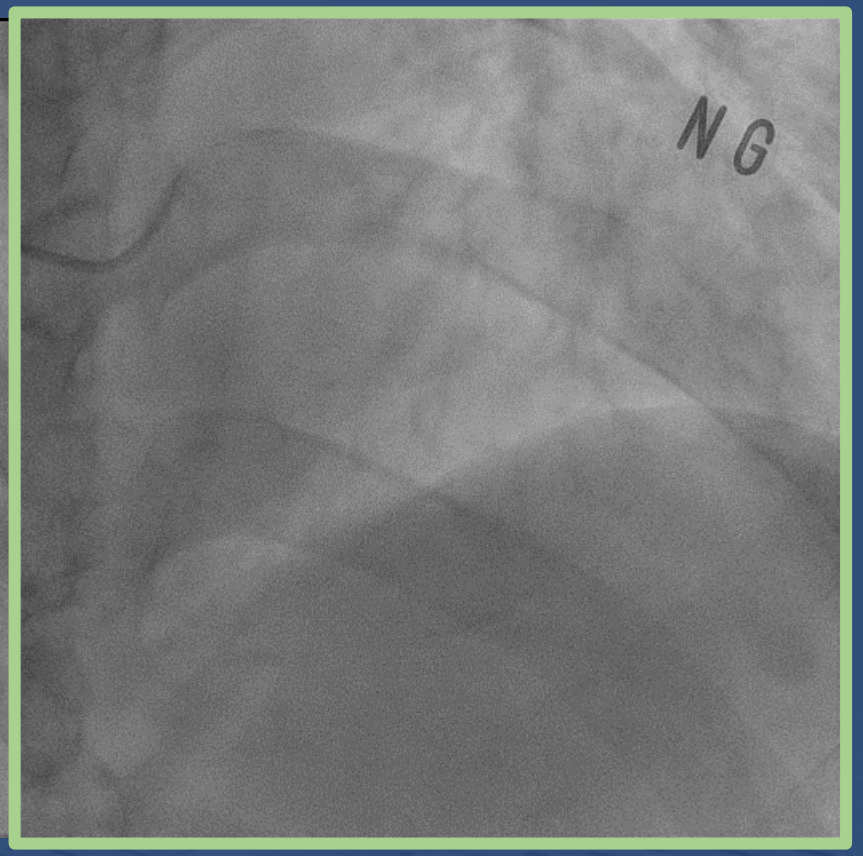


Post-PCI Angio

IC - NICORANDIL

Post-PCI Angio

IC - NICORANDIL



Pre-PCI Angio

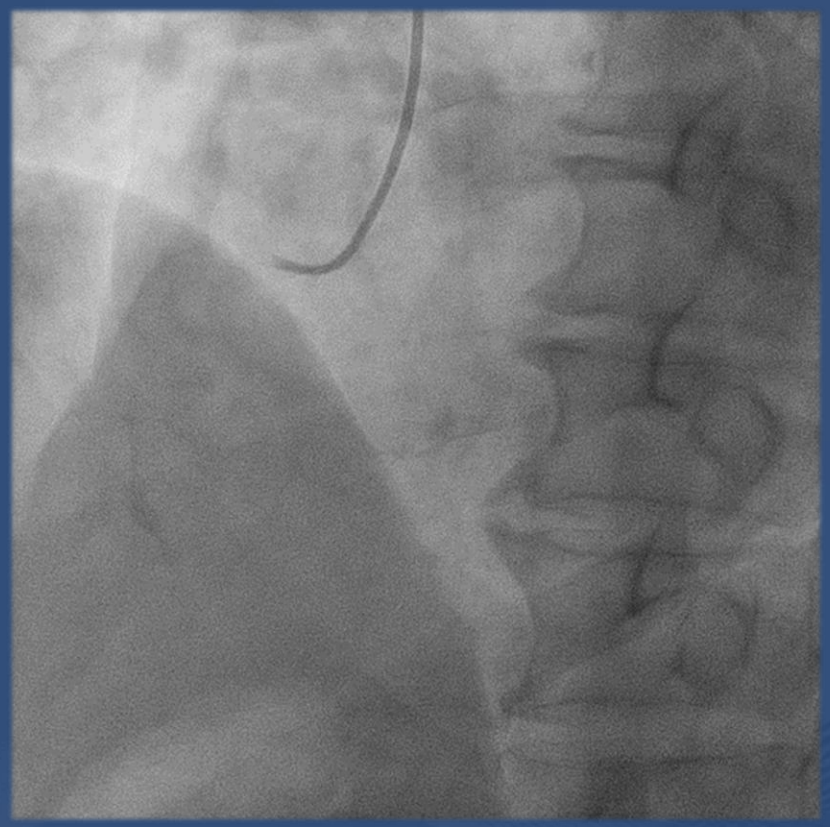
#2 CASE - M/43 (서열 6위) pf.이00 교수님

학력

2016.08	서울대학교 의학대학원 의학과 (박사)
2013.09	서울대학교 보건대학원 보건학과 (석사)
2005.02	고려대학교 의과대학 졸업 (의학사)

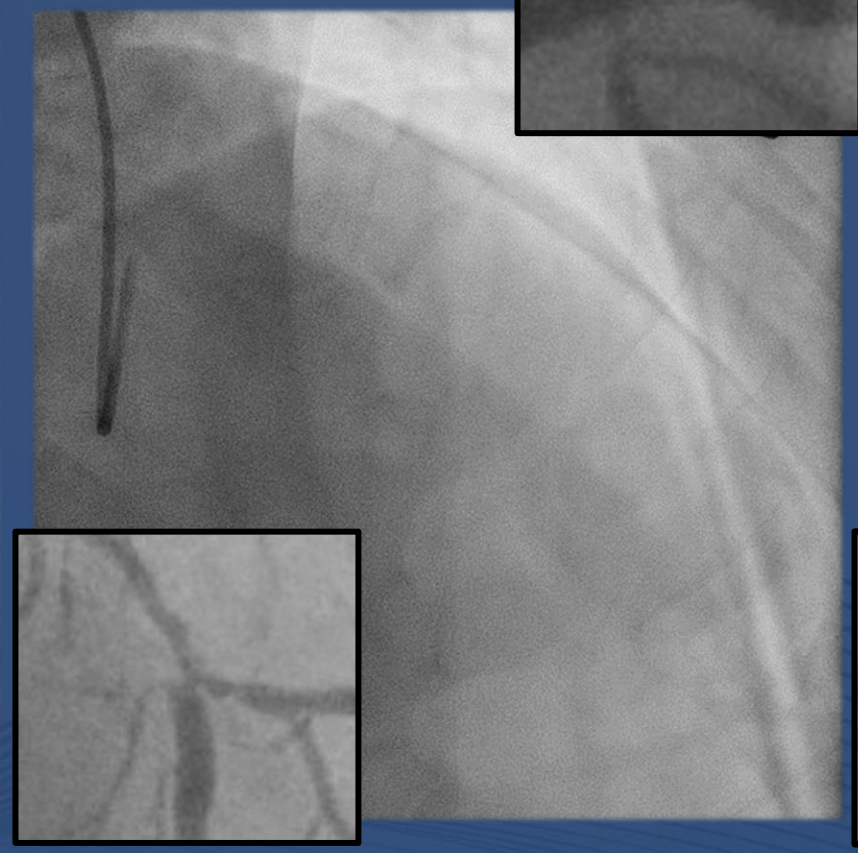
경력

2023.03 ~ 현재	성균관의대 삼성서울병원 내과학 부교수
2019.03 ~ 2023.02	성균관의대 삼성서울병원 내과학 조교수
2019.07 ~ 2020.07	미국 Emory University 연수
2018.03 ~ 2019.02	삼성서울병원 순환기내과 전임대우조교수
2016.03 ~ 2018.02	삼성서울병원 순환기내과 진료조교수
2013.02 ~ 2016.02	서울대학교 병원 순환기내과 전임의
2015.10	순환기내과 분과전문의 자격 취득
2009.03 ~ 2013.02	서울대학교 병원 내과 레지던트 과정 수료
2013.01	내과전문의 자격취득
2009.02	미국 ECFMG 자격 취득
2007.02 ~ 2008.09	육군 군의관
2005.02 ~ 2006.02	서울대학교 병원 인턴과정 수료

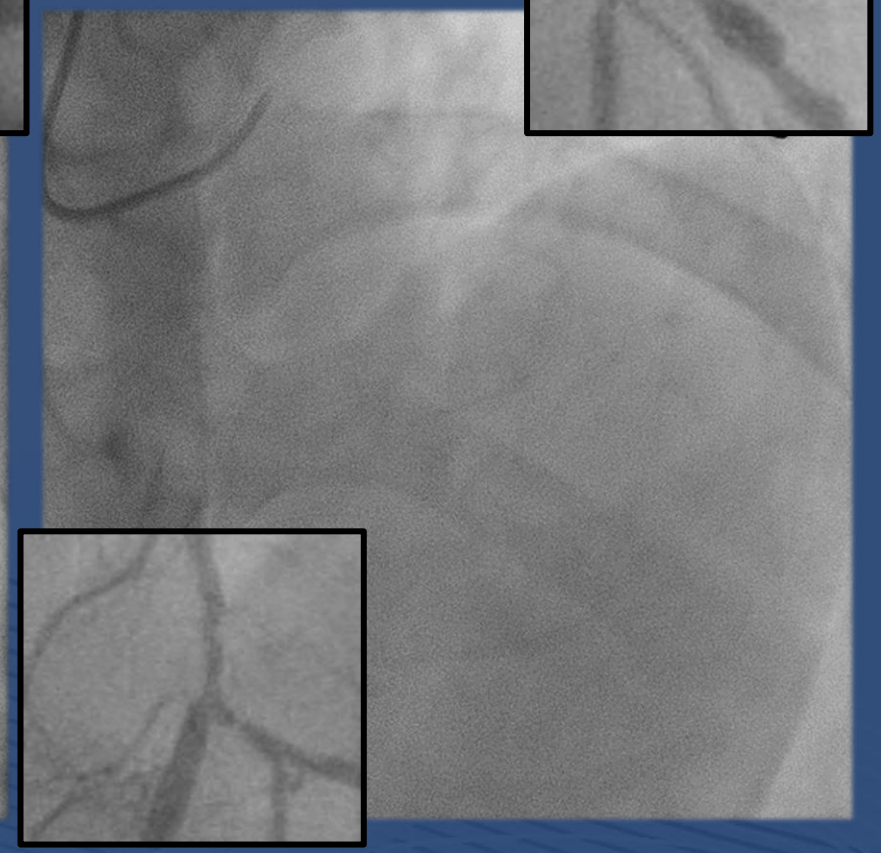


RCA Angio

RCA : Insignificant stenosis



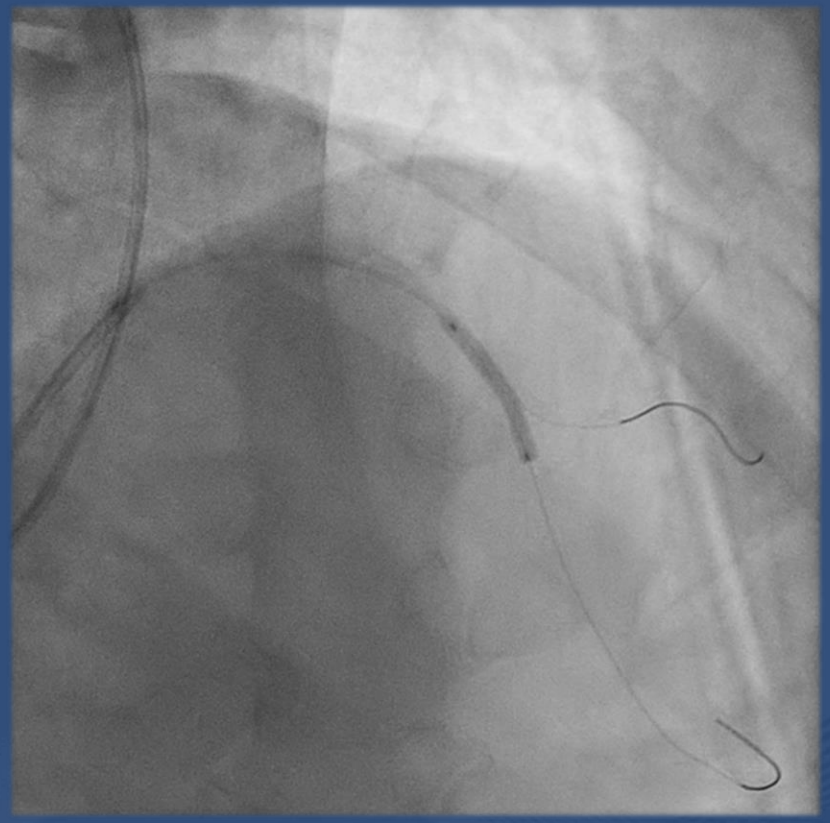
Pre-PCI Angio



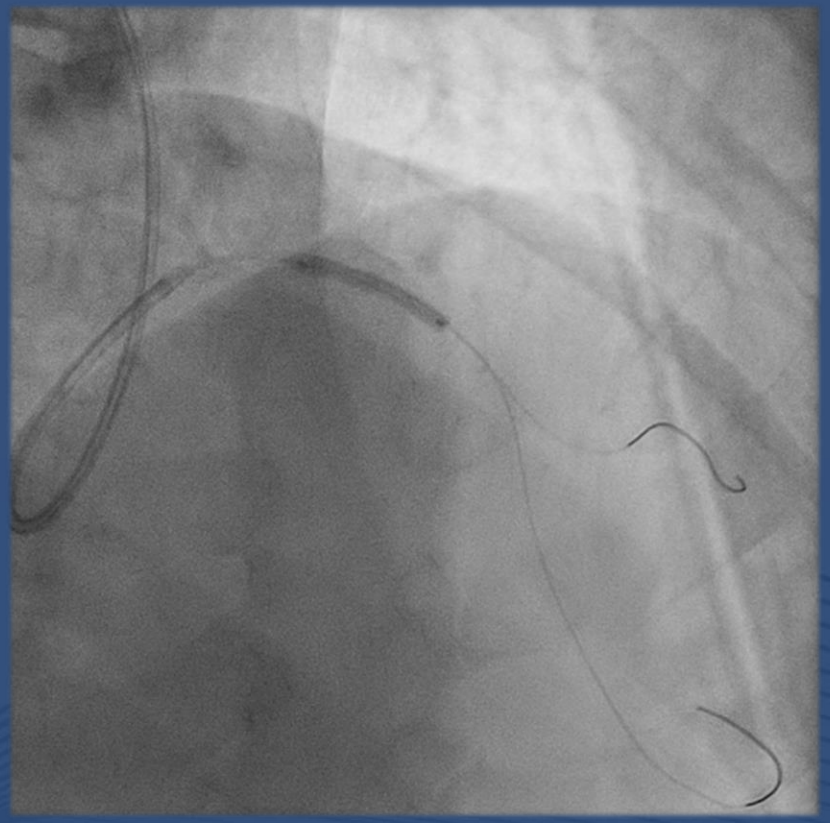
Pre-PCI Angio

LAD prox - mid: Diffuse stenosis up to 90% Medina (1,1,1)

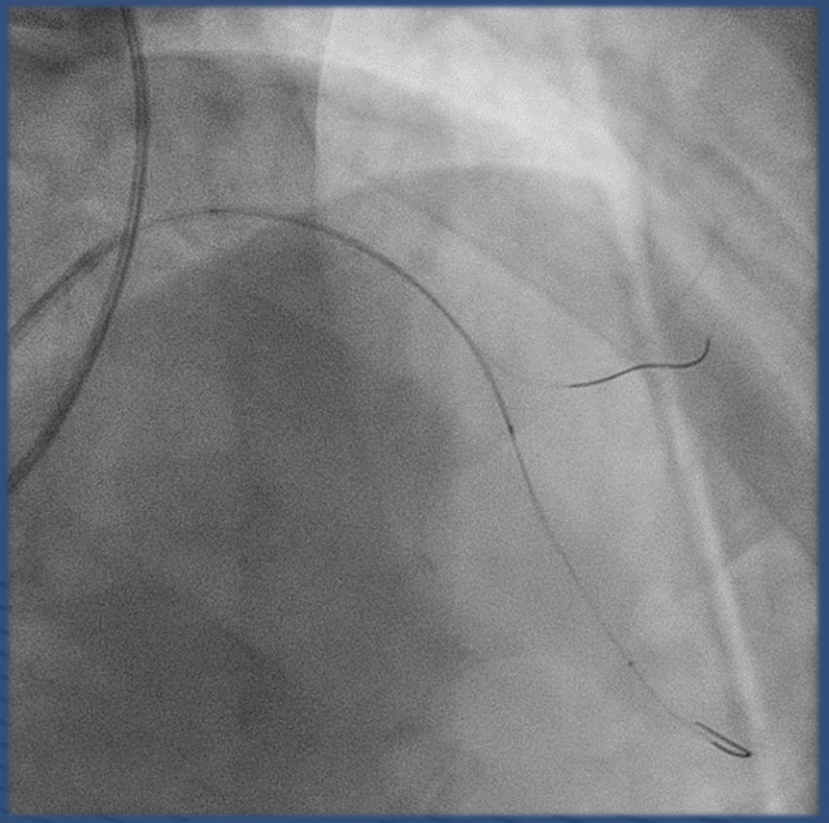
D2 os : Segmental stenosis is up to 70%



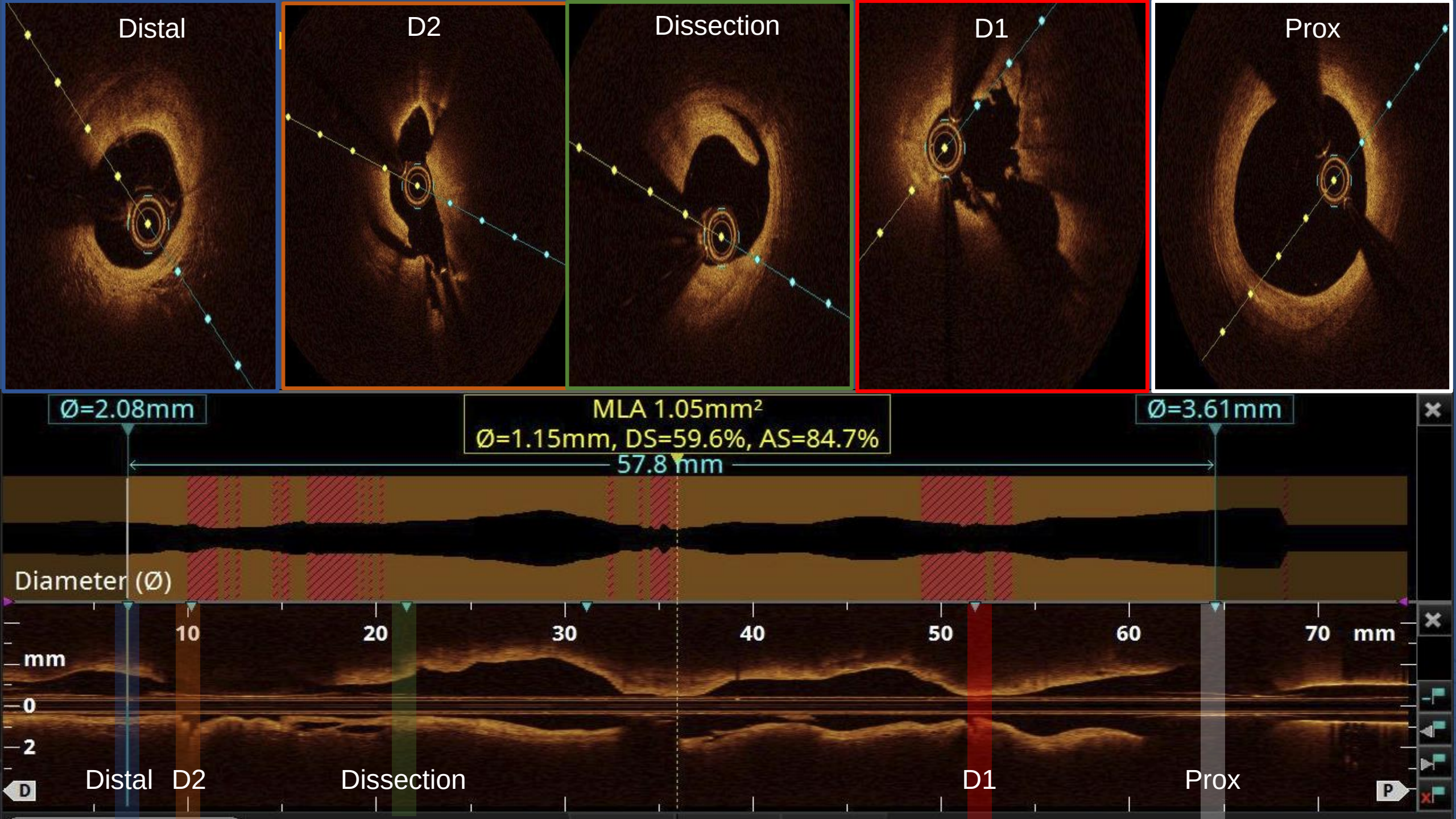
LAD Ballooning
2.5 mm x 20 mm

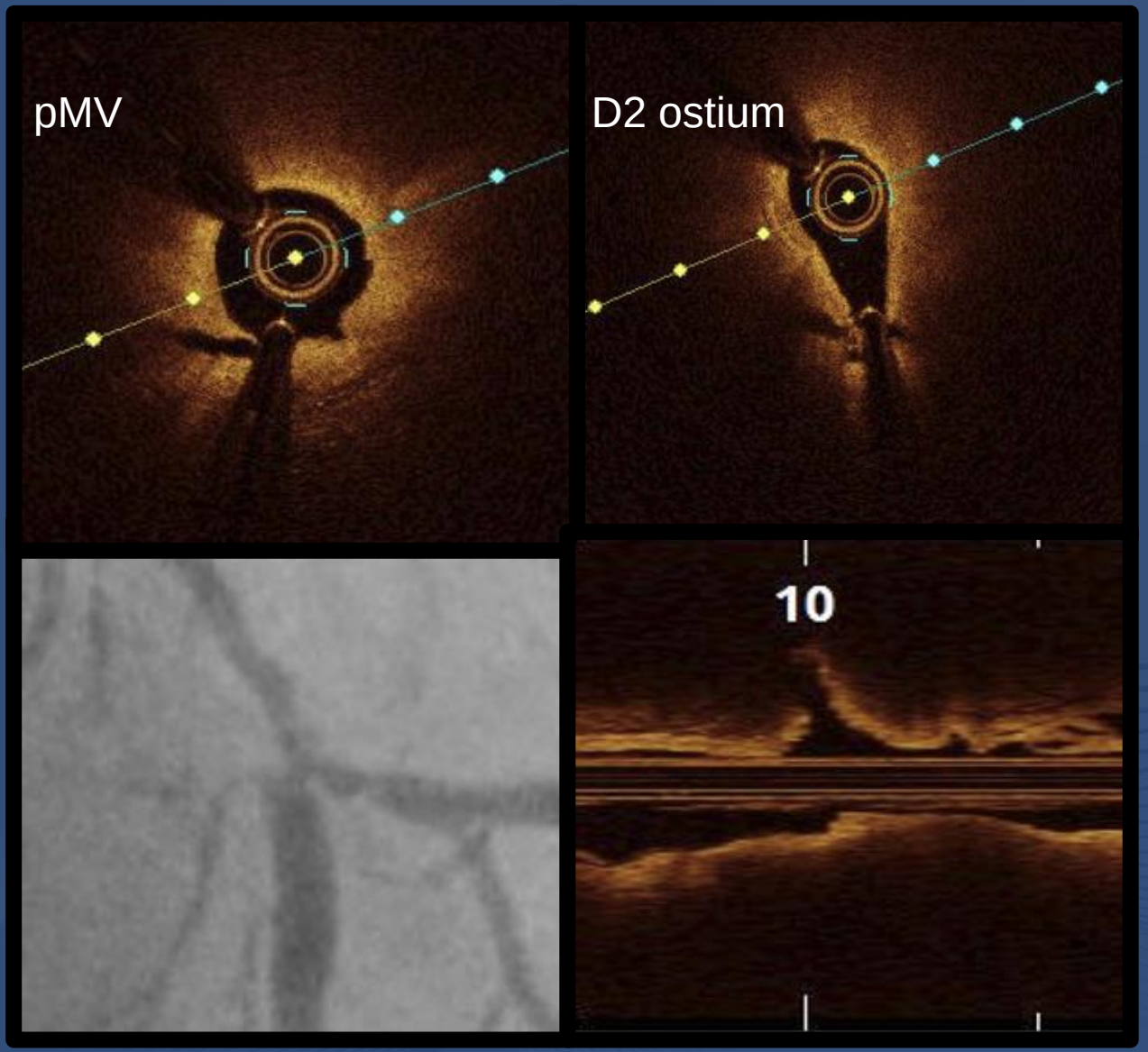


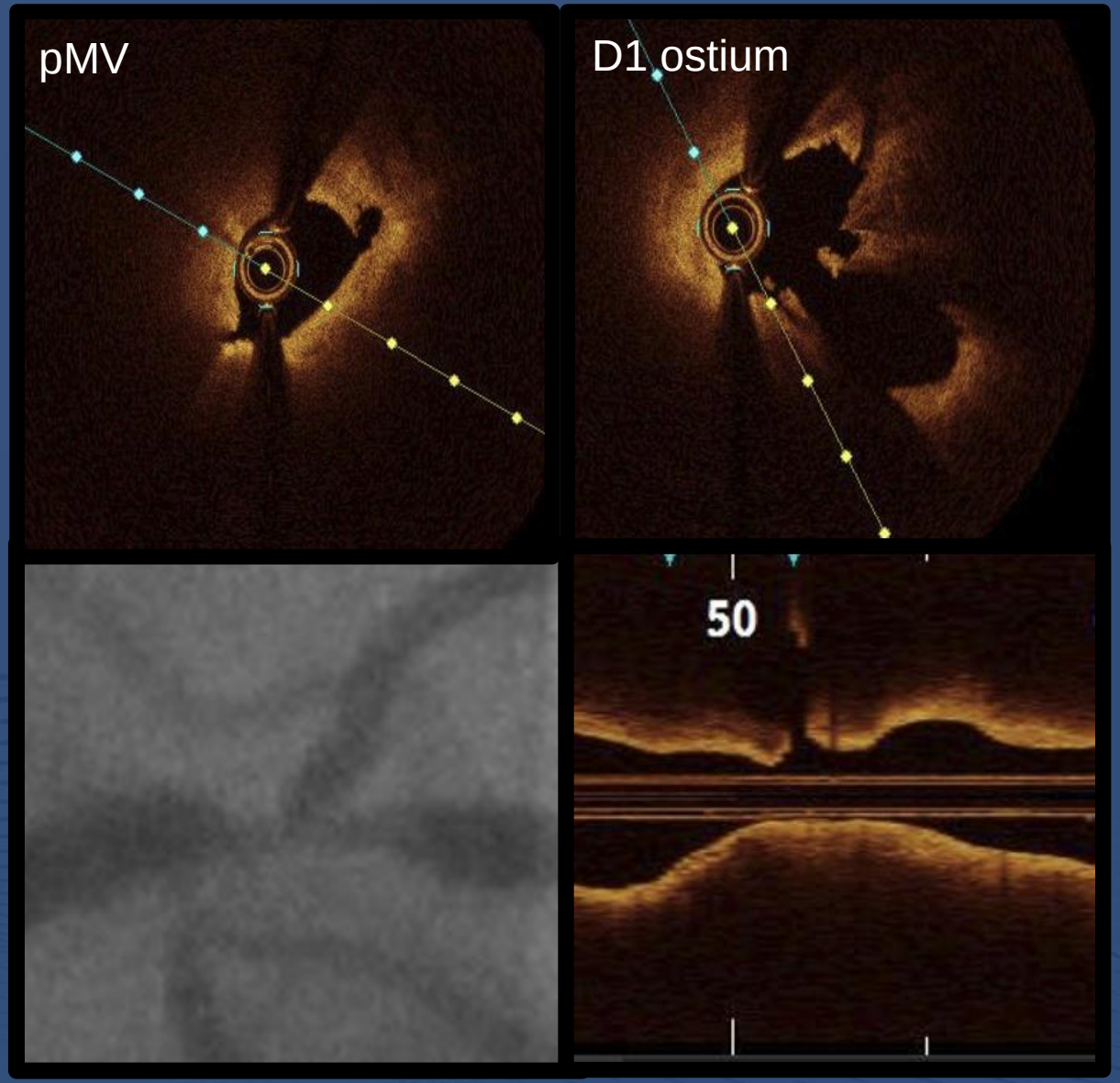
LAD Ballooning
2.5 mm x 20 mm

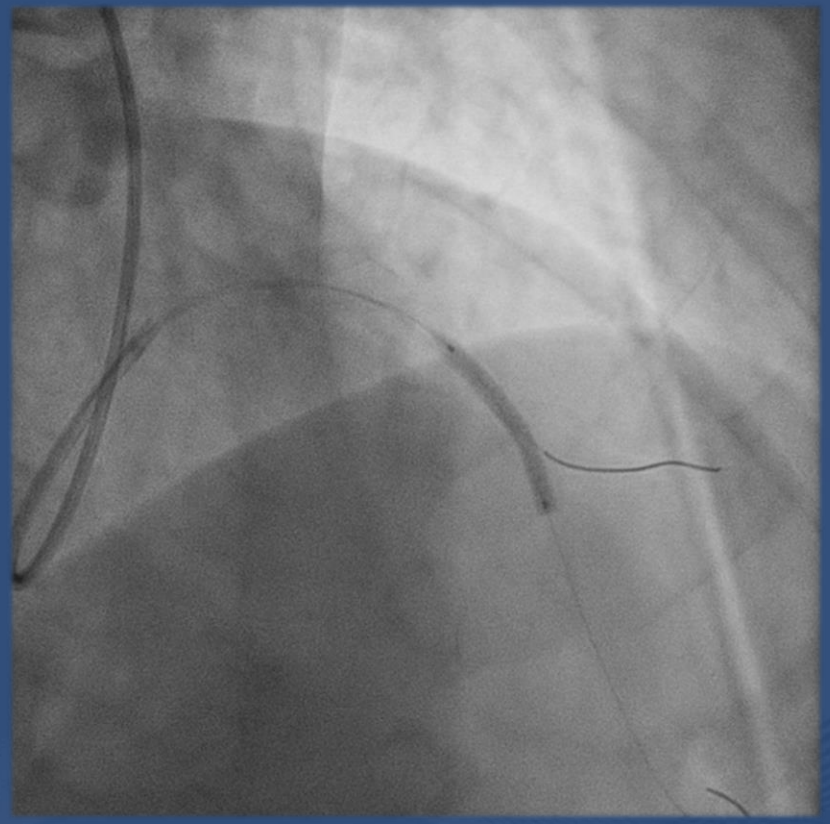


OCT (+)


Distal
D2
Dissection
D1
Prox
Ø=2.08mm
MLA 1.05mm²
Ø=1.15mm, DS=59.6%, AS=84.7%
Ø=3.61mm
57.8 mm
Diameter (Ø)
10
20
30
40
50
60
70
mm
mm
0
2
Distal
D2
Dissection
D1
Prox
D
P

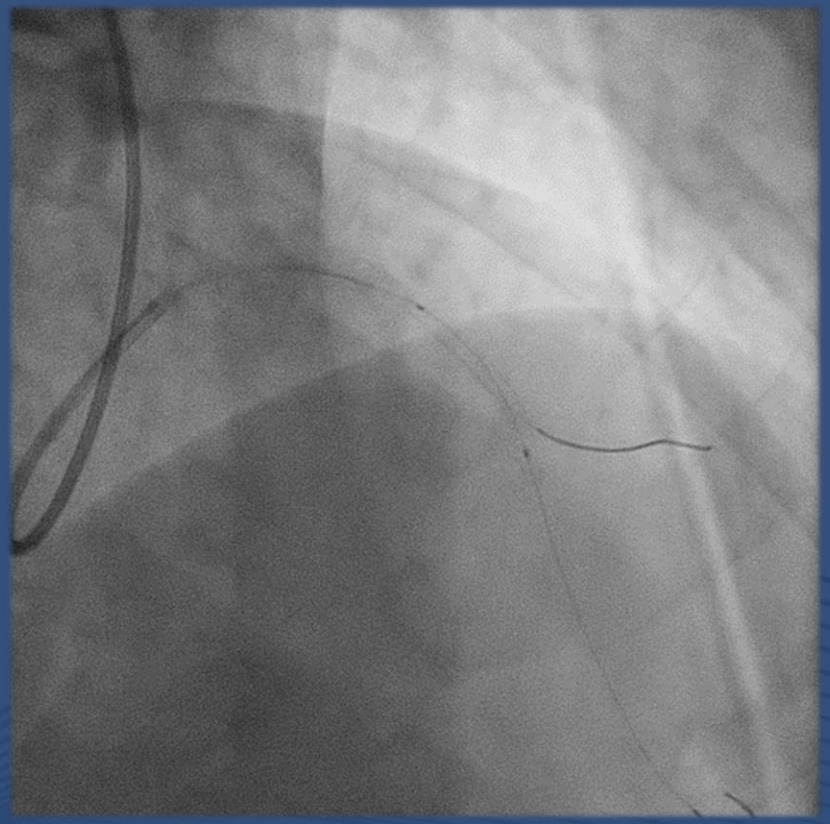

pMV
D2 ostium
10


pMV
D1 ostium
50

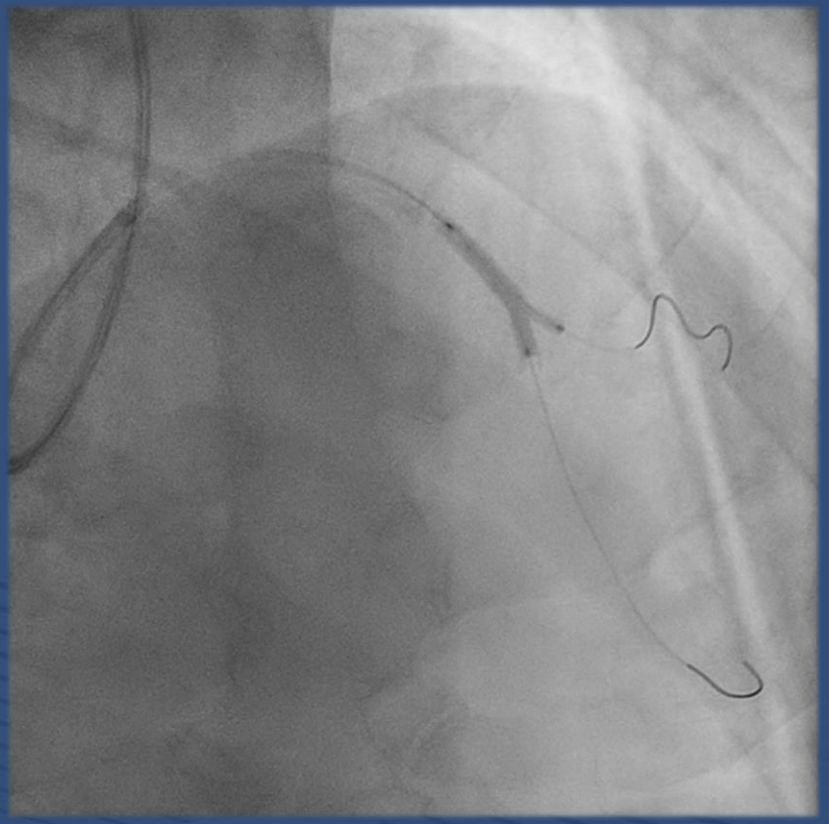


mLAD Stent

2.5 mm x 23 mm (Xience Skypoint)



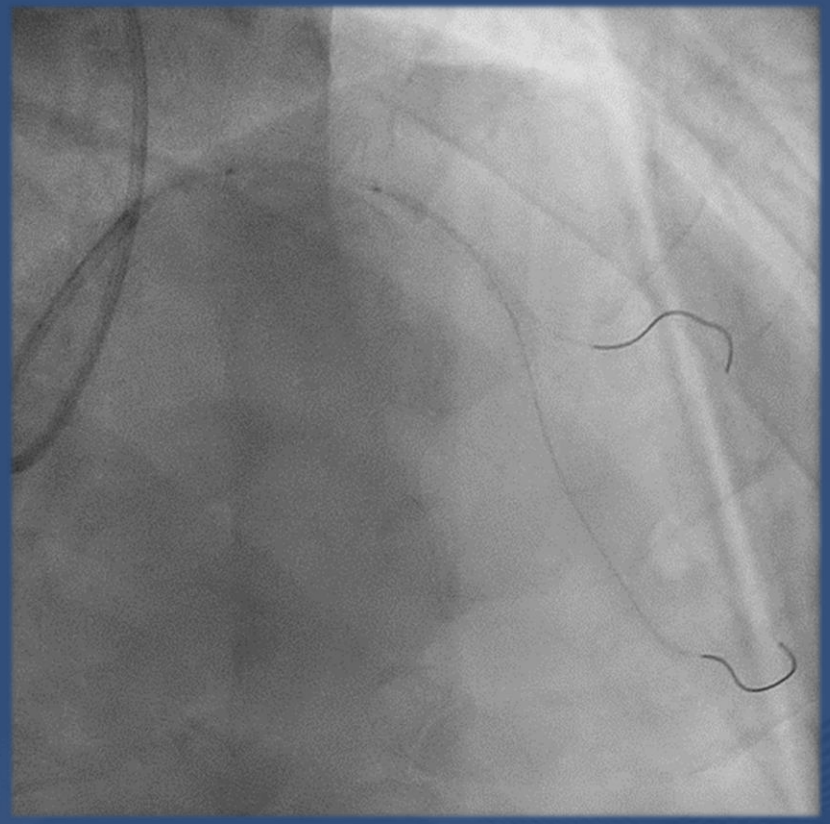
Post mLAD Stent

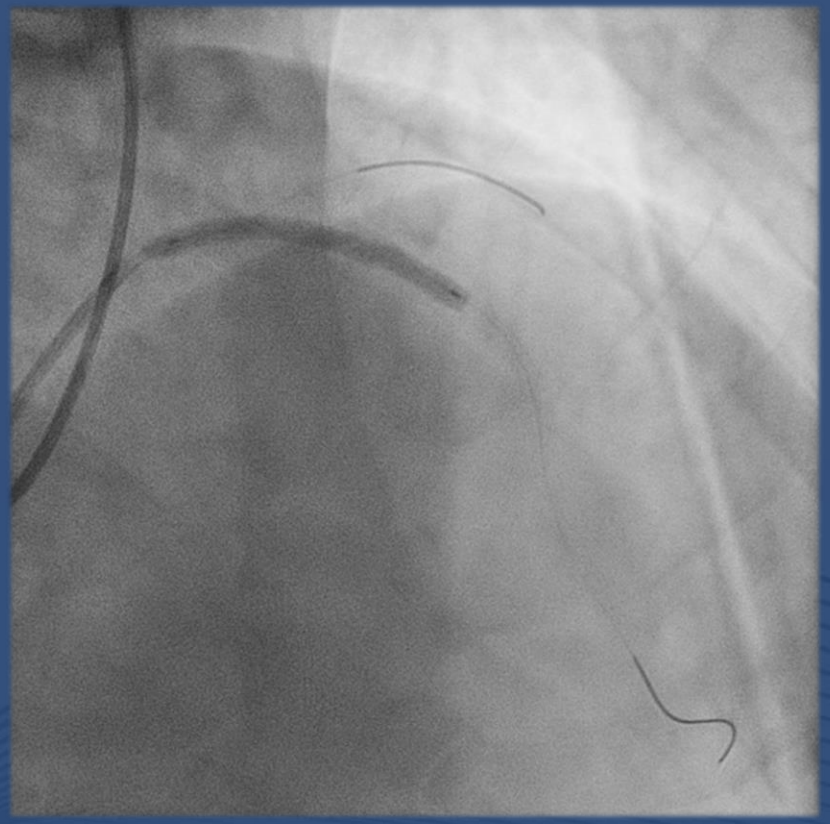


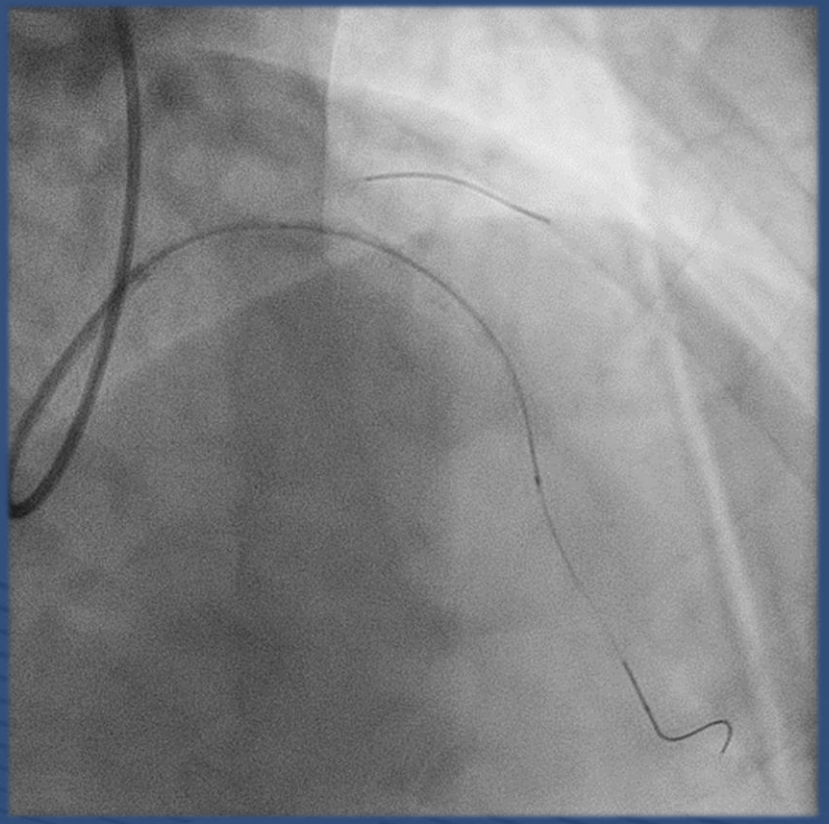
Kissing Balloon

2.5 mm x 20 mm (LAD)

2.0 mm x 20 mm (D2)





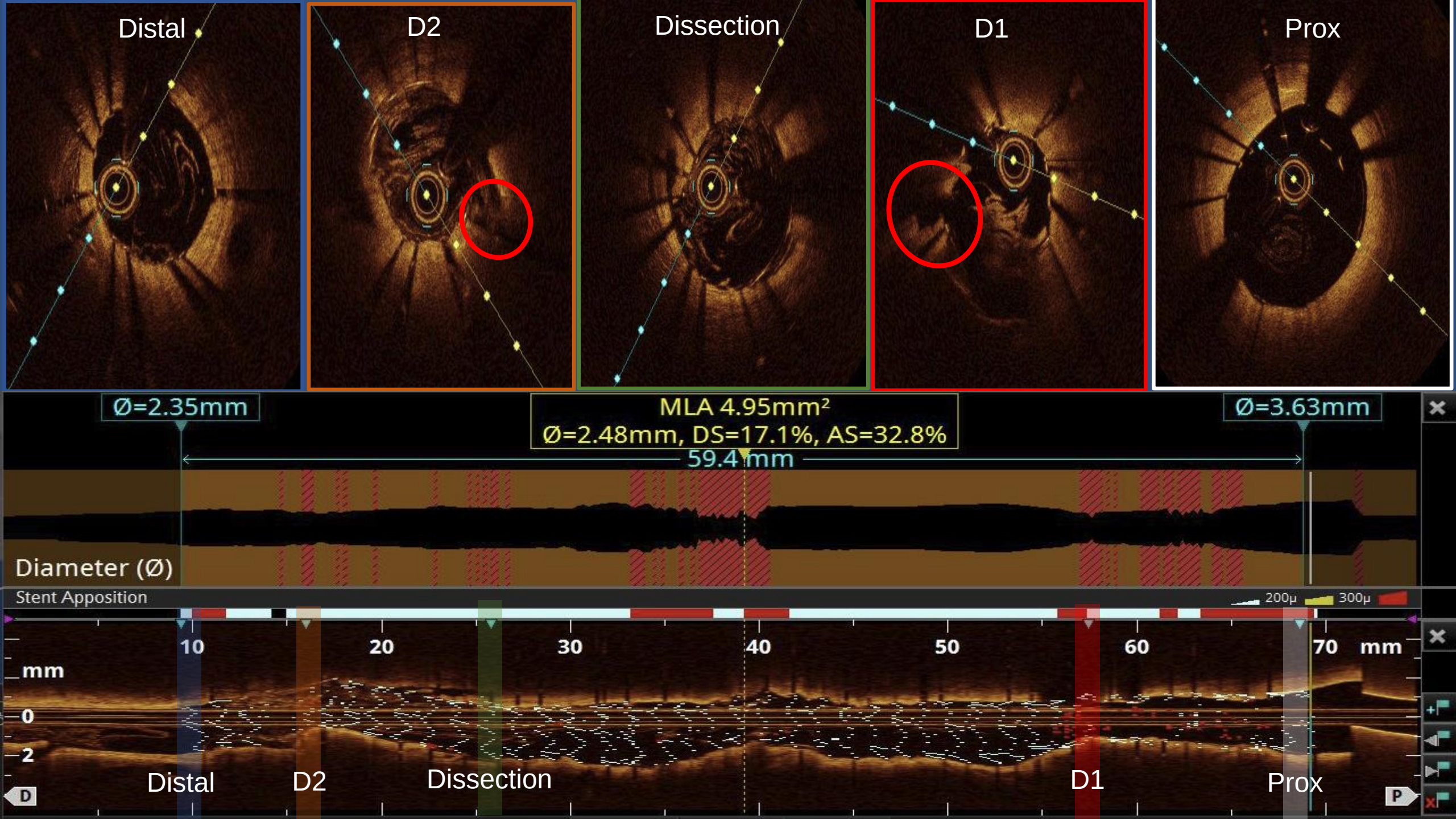


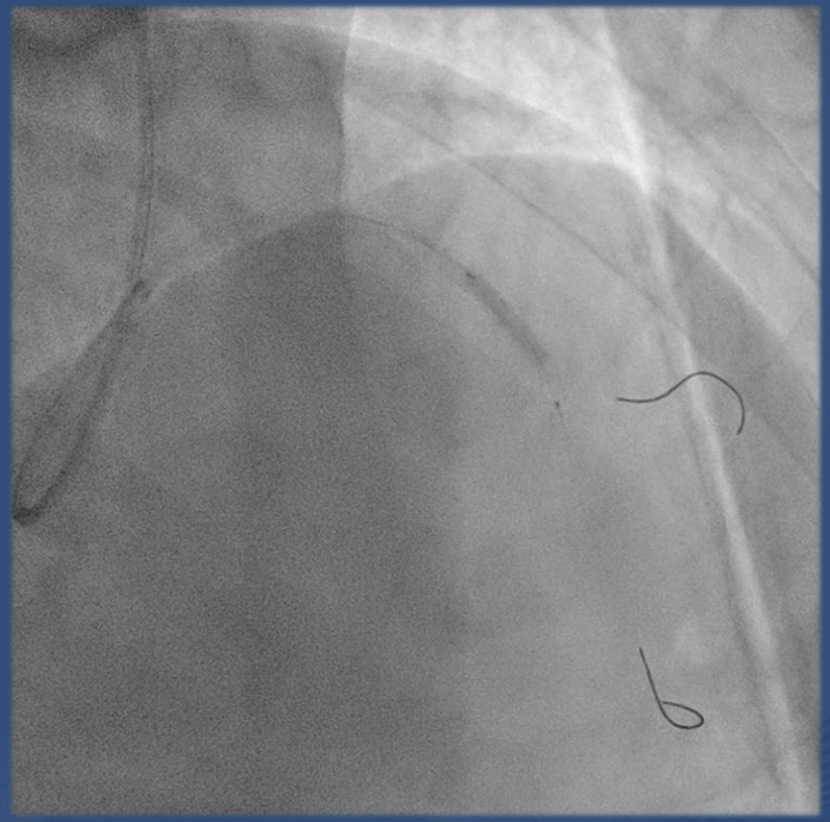
Post Kissing Balloon

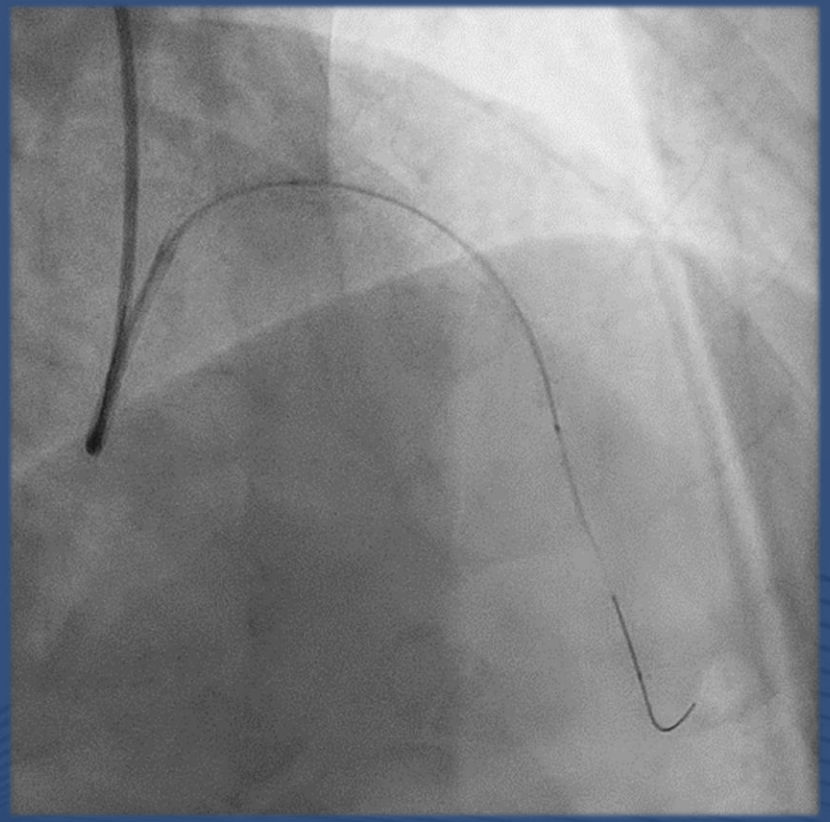
D1 wiring & p-mLAD Stent

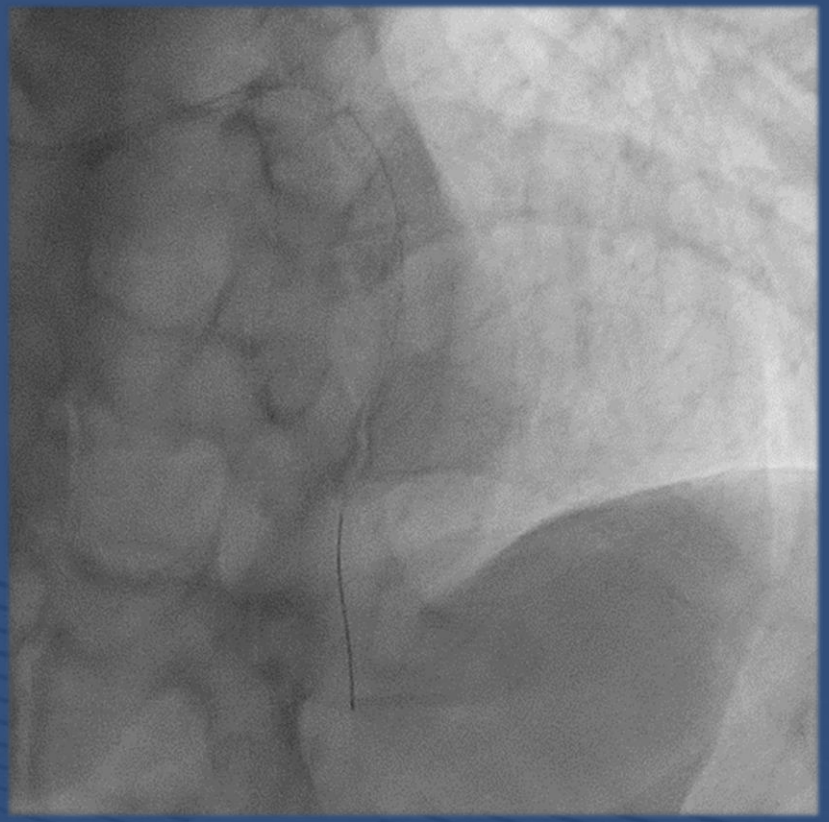
3.25 mm x 38 mm (Xience Skypoint)

OCT (+)


Distal
D2
Dissection
D1
Prox
Ø=2.35mm
MLA 4.95mm²
Ø=2.48mm, DS=17.1%, AS=32.8%
Ø=3.63mm
59.4 mm
Diameter (Ø)
Stent Apposition
200µ
300µ
10
20
30
40
50
60
70
mm
mm
0
2
Distal
D2
Dissection
D1
Prox
D
P







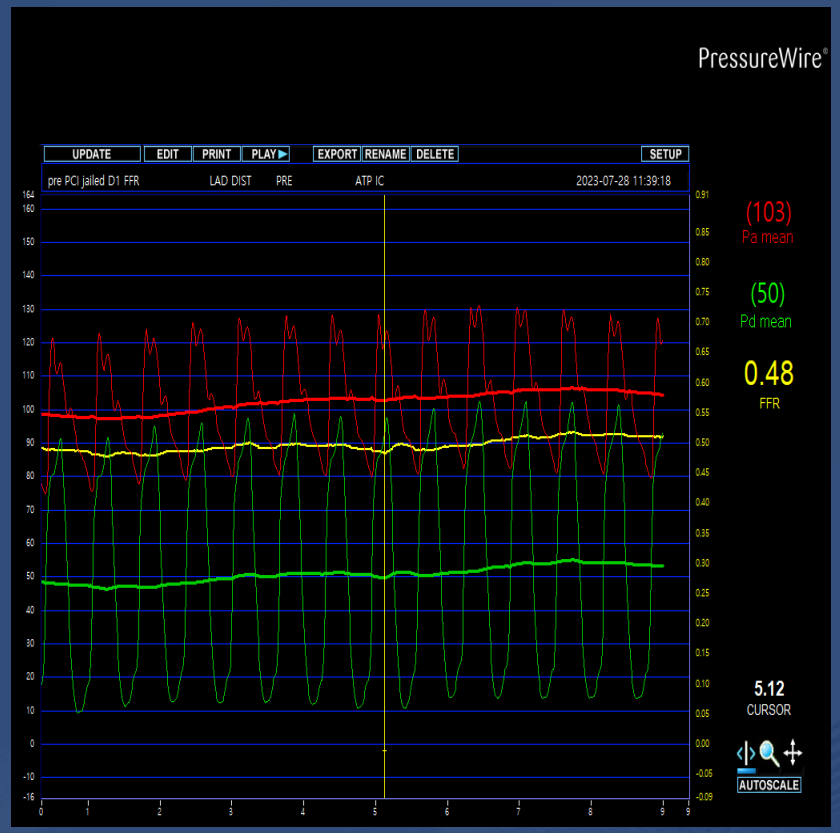
Post Dilation

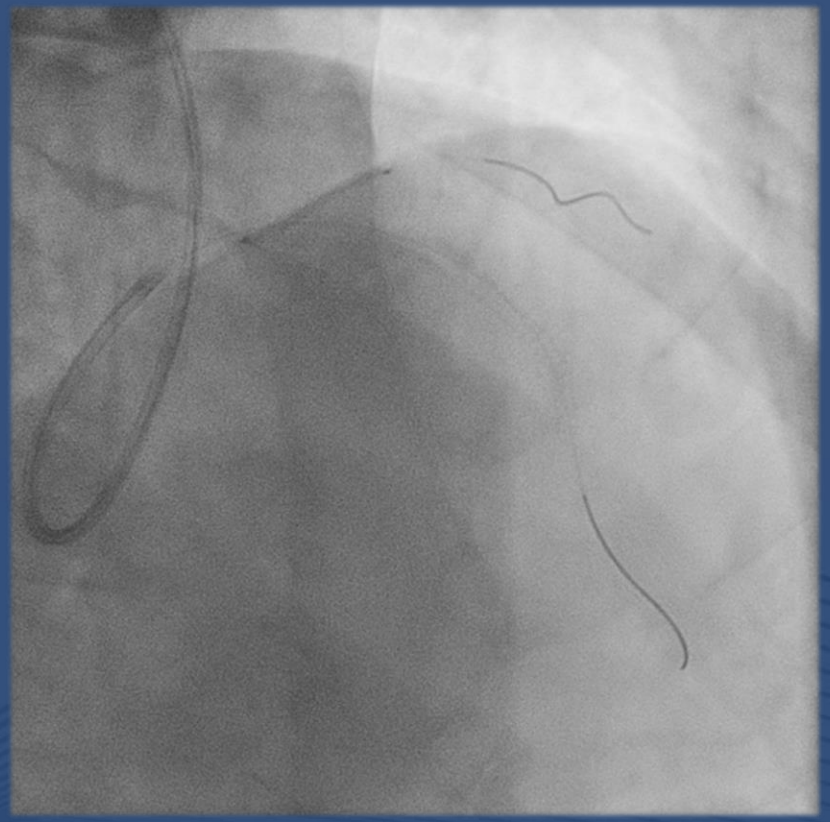
OCT (+)

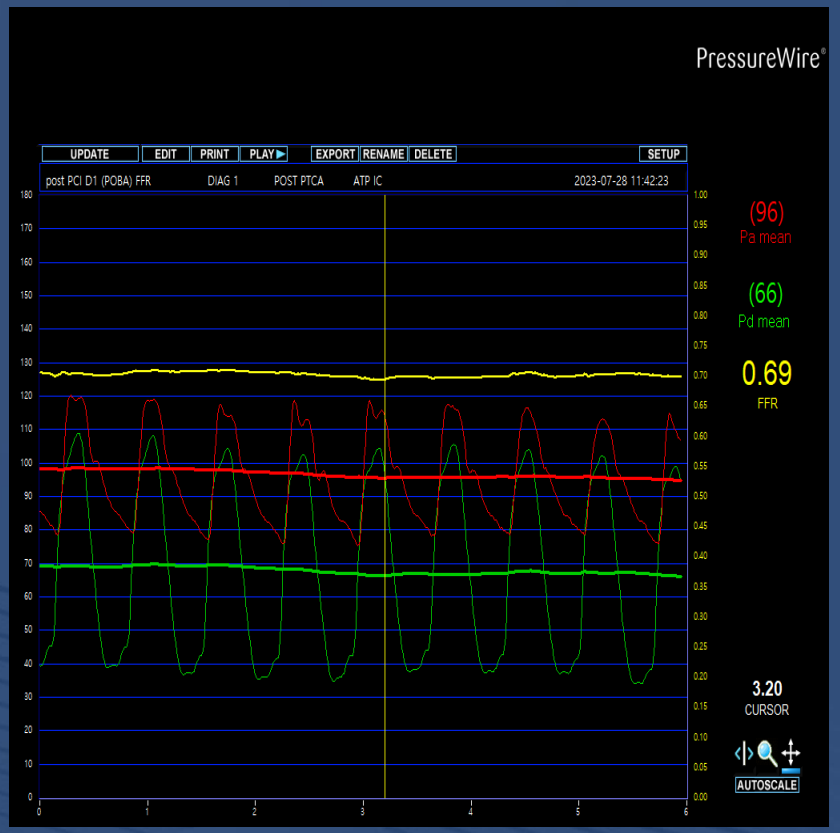
Procedure Finish ??

2.75 mm x 20 mm (NC)
3.25 mm x 38 mm (Stent Balloon)

CVRF





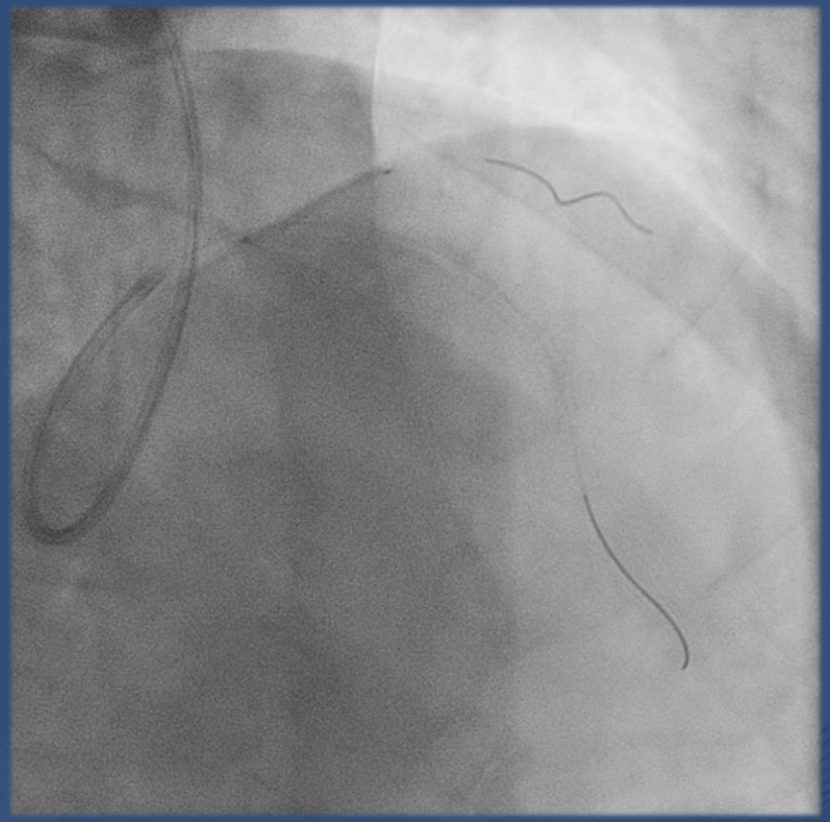


Pre D1 FFR

D1 Ballooning

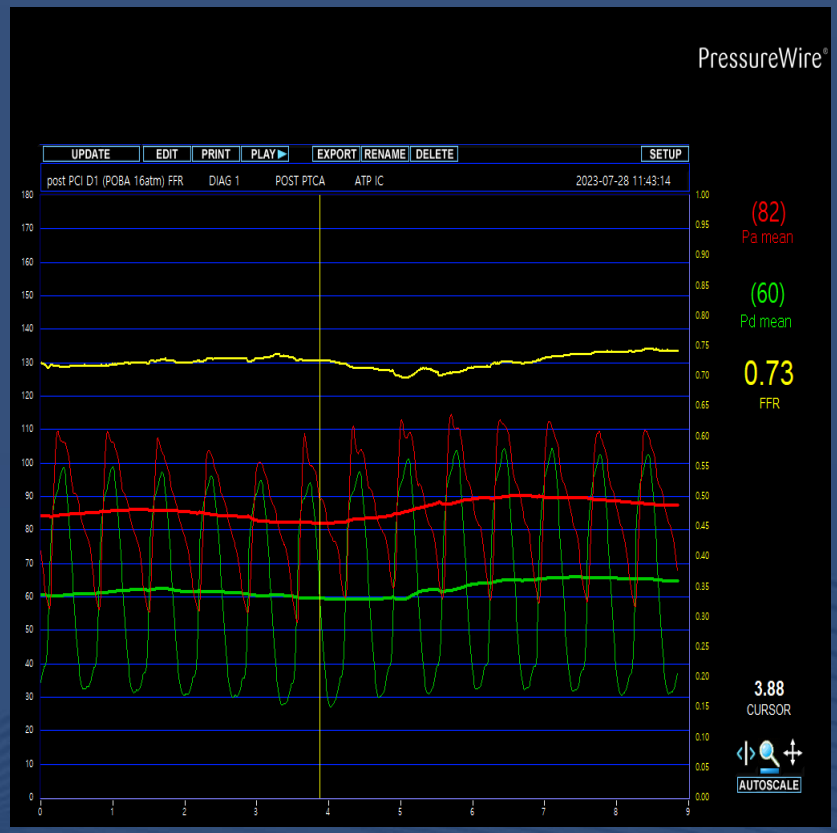
1.5 mm x 20 mm (8atm)

Post D1 FFR (8atm)

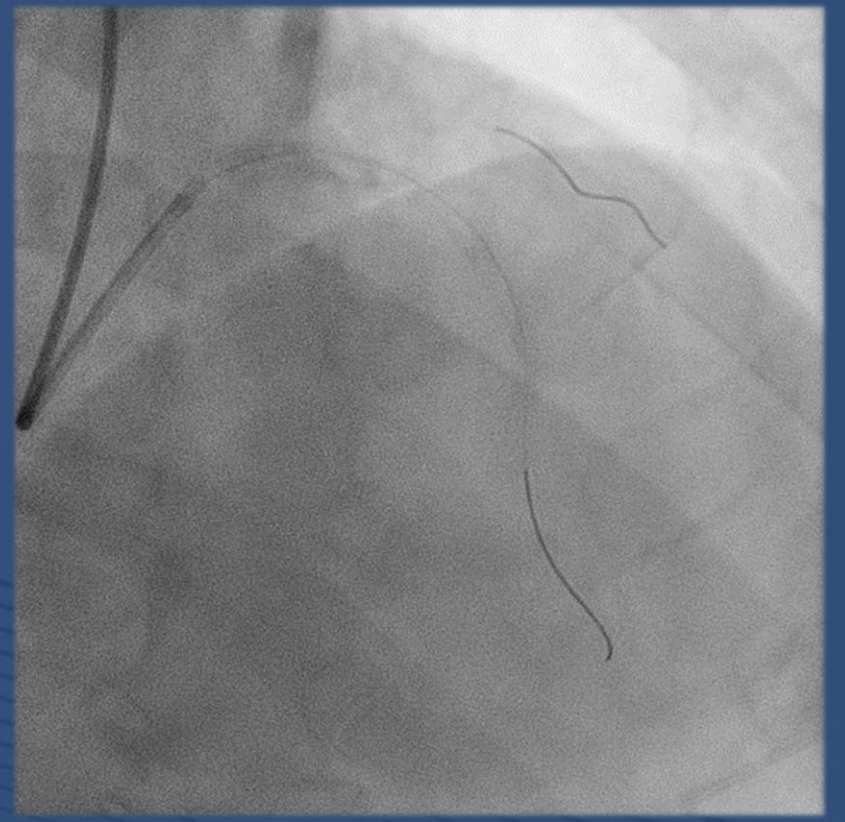


D1 Re Ballooning

1.5 mm x 20 mm (16atm)



Post D1 FFR (16atm)



Post-PCI Angio

1

# of Proximal Optimization Technique Guided by Intravascular Ultrasound on Stent Expansion, Stent Symmetry Index, and Side-Branch Hemodynamics in Patients With Coronary Bifurcation Lesions

Diaa Hakim, Arka Chatterjee, Olusuen Alli, Joshua Turner, Assad Sattar, Nicolas Foin and Massoud A. Leesar

Originally published 16 Oct 2017 | https://doi.org/10.1161/CIRCINTERVENTIONS.117.005535 | Circulation: Cardiovascular Interventions. 2017;10:e005535

Circulation: Cardiovascular Interventions

Abstract

Background—

Bench models of coronary bifurcation lesions demonstrated that the proximal optimization technique (POT) expanded the stent and opened the side branch (SB). We investigated the role of POT guided by intravascular ultrasound on the main vessel (MV) stent expansion and SB fractional flow reserve (FFR) in patients with coronary bifurcation lesion.

SB FFR cut off > 0.75

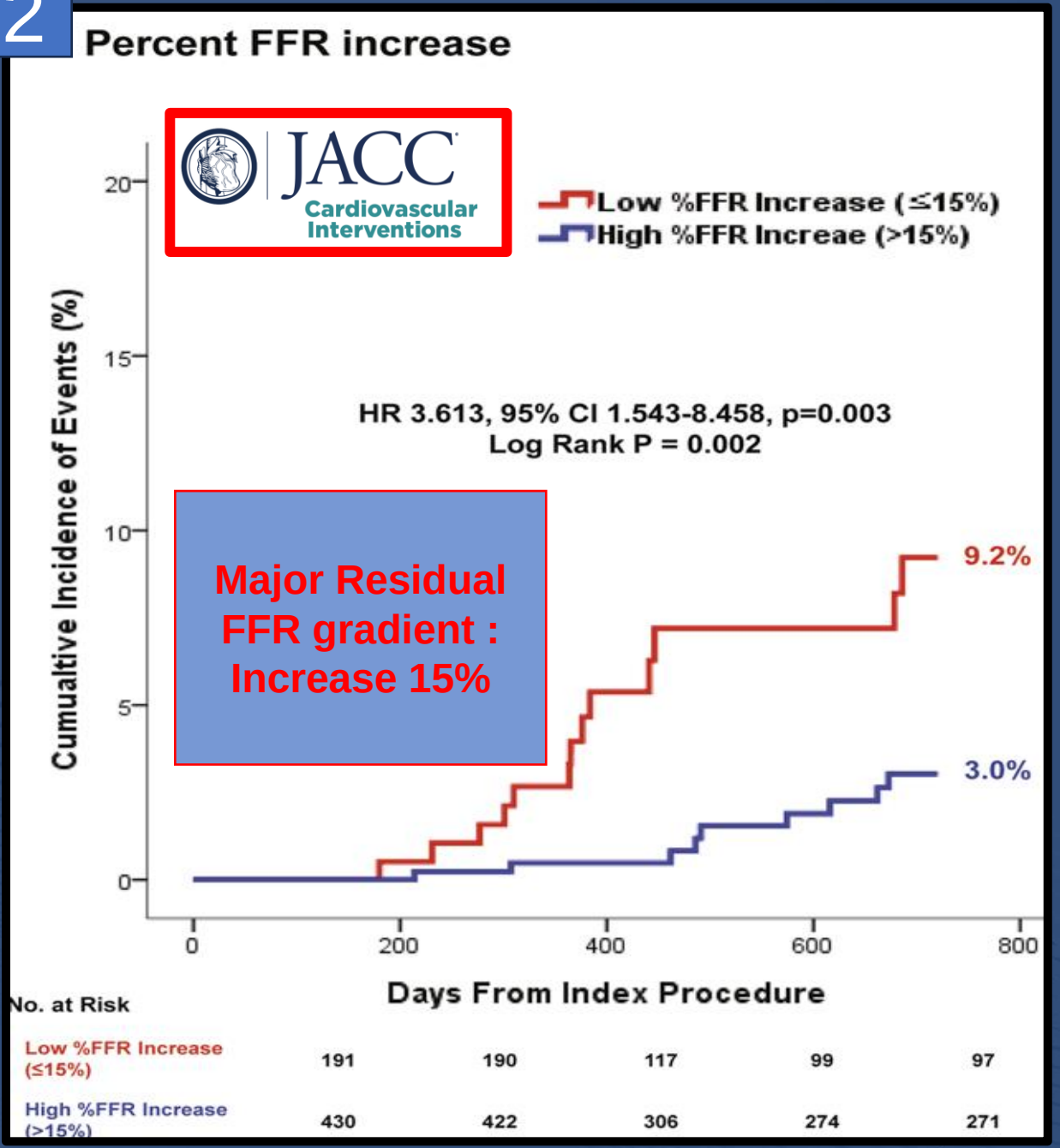
Methods and Results—

In 40 patients with coronary bifurcation lesion, 120 intravascular ultrasound examinations of the MV were performed at baseline, after MV stenting, and POT followed by 95 FFR measurements of the SB. In the proximal stent segment, stent volume index and minimum stent area were larger after POT versus MV stenting (9.2±3.4 versus 7.40±2.0 mm^3/mm and 7.65±1.8 versus 6.38±1.7 mm^2, respectively; $P<0.01$). In the bifurcation segment, minimum stent area was larger after POT versus MV stenting (6.45±2.1 versus 5.9±2.0 mm^2, respectively; $P<0.05$). POT expanded the stent symmetrically. After POT, SB FFR was <0.75 in 12 patients (30%), which improved to >0.75 after SB dilation or SB stenting+final POT. SB FFR was significantly higher after POT+SB dilation or SB stenting+final POT versus after MV stenting and POT.

Conclusions—

This is the first study of POT guided by intravascular ultrasound in patients with coronary bifurcation lesion, demonstrating that POT symmetrically expanded the proximal and bifurcation segments of the stent. After POT, SB FFR was <0.75 in a third of patients, which improved to >0.75 after SB dilation or SB stenting+final POT.

2



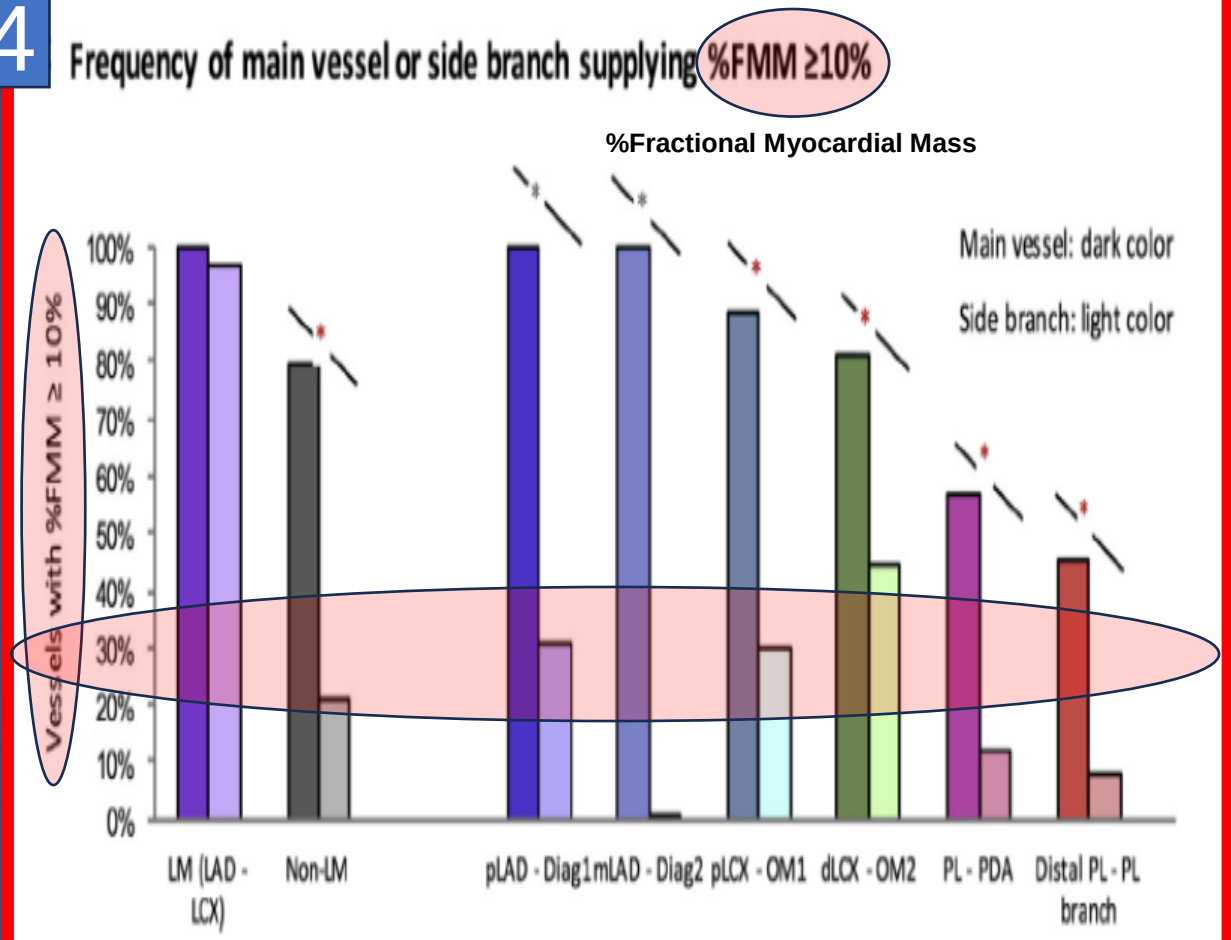
Joo Myung Lee et al. *J Am Coll Cardiol Intv* 2018; 11:2099-2109

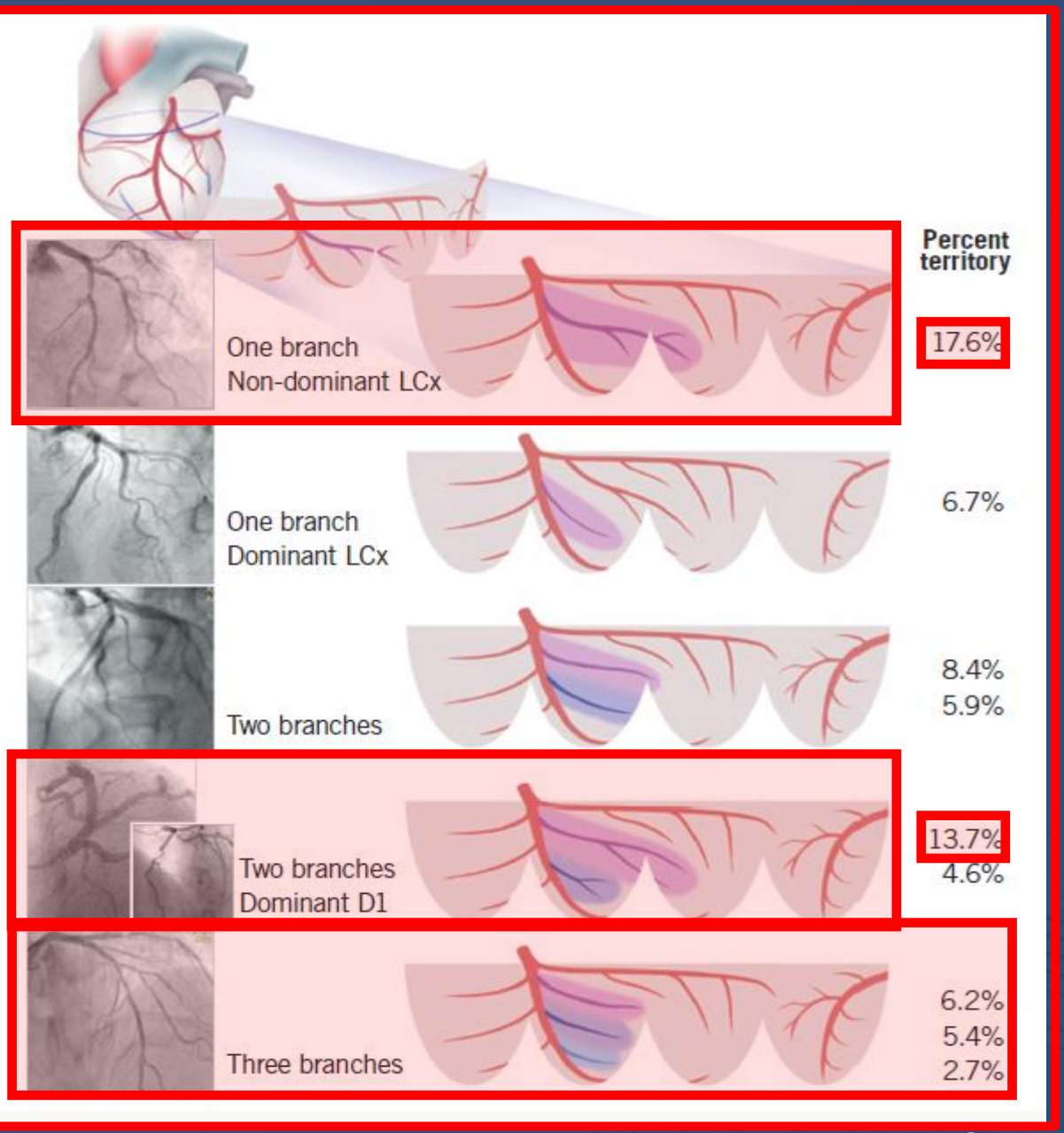
3

Compromise SB after Provisional Stenting

"TIMI 3" "No EKG Change" "No Chest pain "

4





HY Kim. JACC cvi 2017

Joen WK, Lee JM,,, Koo BK, Eurointervention 2020;16:e1-e9

Conclusion

- Provisional stent PCI 1ST Goal -> Main vessel stent optimization
- Provisional stent PCI 2nd Goal -> No SB occlusion
- SB occlusion risk prediction : Angiography , IVUS , OCT
- SB protection : Jailed Wire technique & Jailed Balloon technique
  (+) Jailed Micro Catheter (Corsair) technique
- SB compromise : 1st Concept -> TIMI 3 & No EKG change & No Chest pain
  2nd Concept -> FFR (>0.75 ? , FFR gradient Increase 15%)
  3rd Concept -> Clinically Relevant Side branch
  Anatomical territory ≠ Ischemic territory (%FMM)