

# IVUS to Guide CTO PCI

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CASE WESTERN RESERVE  
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# Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

## Affiliation/Financial Relationship

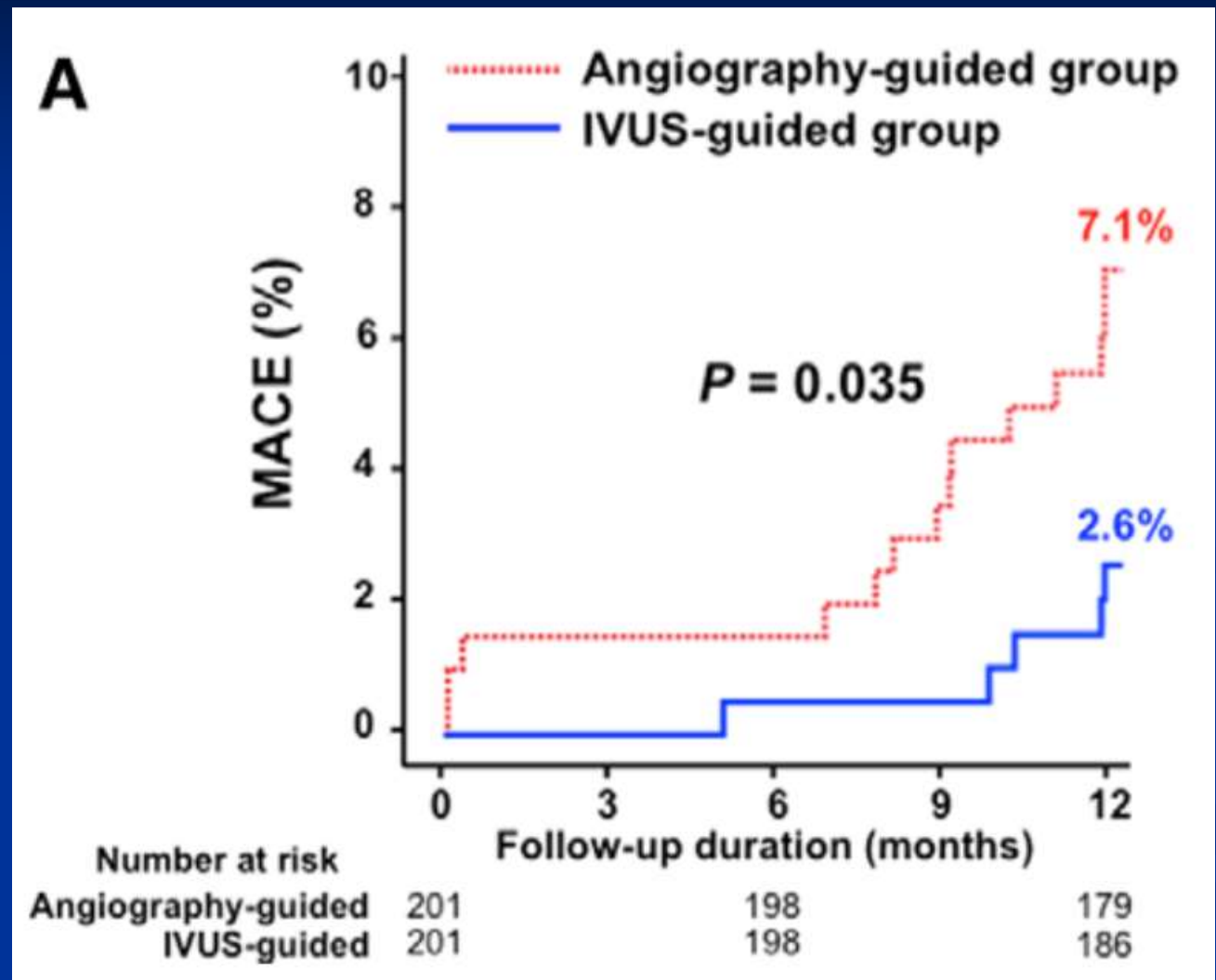
- Grant/Research Support
- Consulting Fees/Honoraria
- Major Stock Shareholder/Equity
- Royalty Income
- Ownership/Founder
  
- Intellectual Property Rights
- Other Financial Benefit

## Company

Volcano, InfraRedx,  
Volcano  
Technology Solutions Group  
None  
Technology Solutions Group,  
BioInfo Accelerator Fund  
None  
None

# IVUS guided CTO improves outcomes

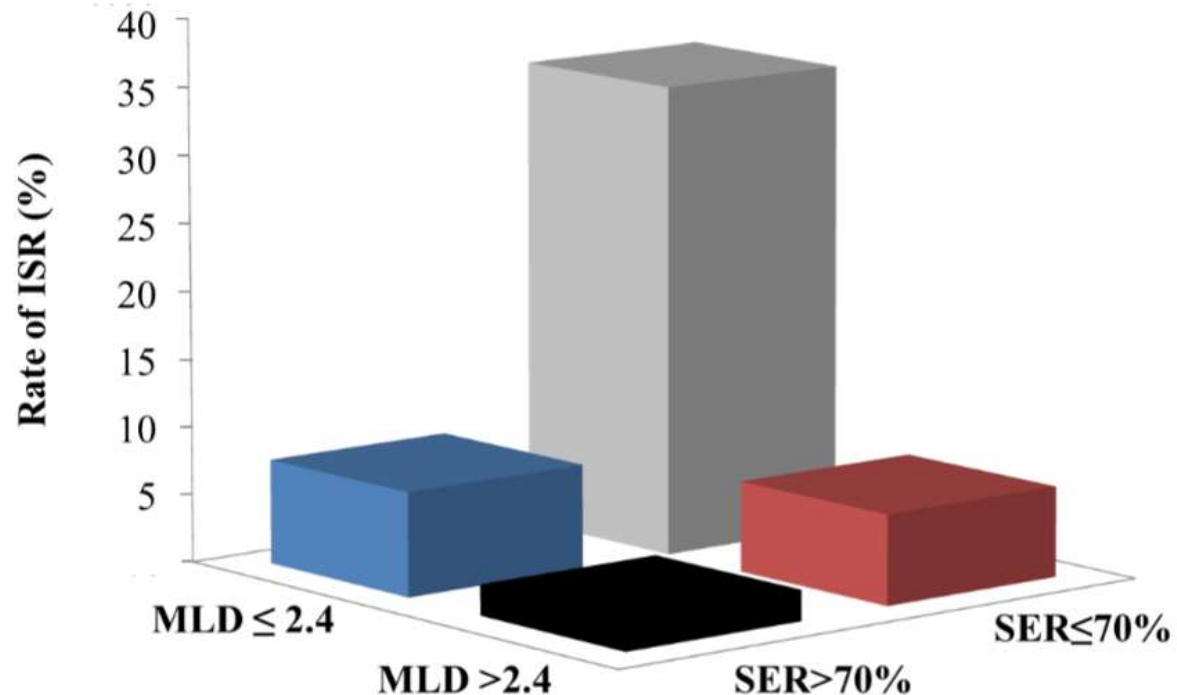
Randomized  
N=402  
All DES



# IVUS predictors of restenosis in CTO

N=126  
All DES

Small MLD,  
underexpansion



		MLD by QCA		Overall P by $\chi^2$	Interaction P value
		≤2.4mm	>2.4mm		
SER by IVUS	≤70%	34.62% (9/26)	6.67% (2/30)	0.004	0.038
	>70%	7.69% (2/26)	2.27% (1/44)		

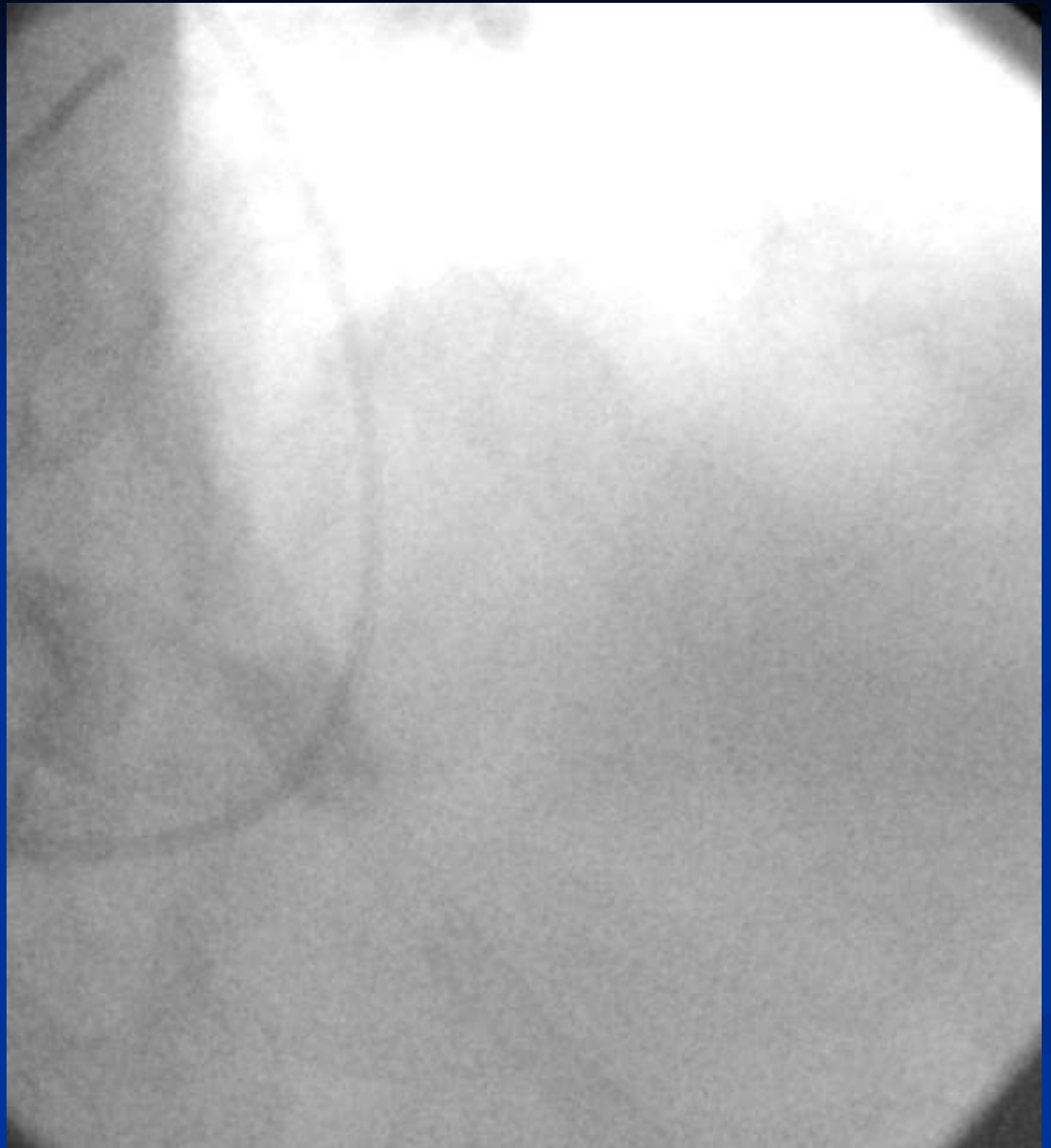
# Two ways I use IVUS which can NOT be done by angiography alone

- Guide “flush occlusion” CTO PCI
- Assess extent of subintimal wire course

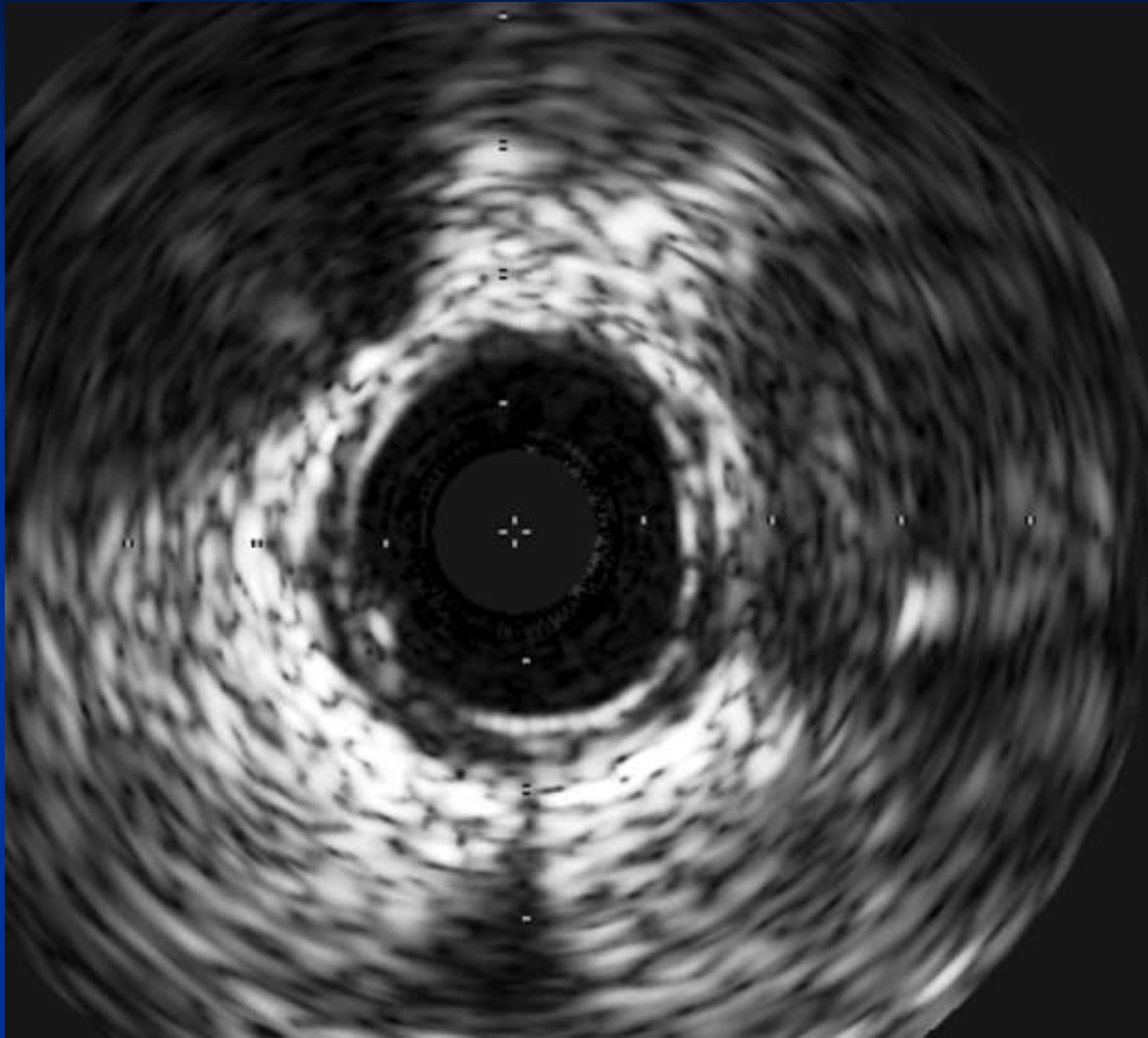
JP: CTO of  
LAD



JP: CTO of  
LAD



# JP: IVUS to guide proximal cap penetration

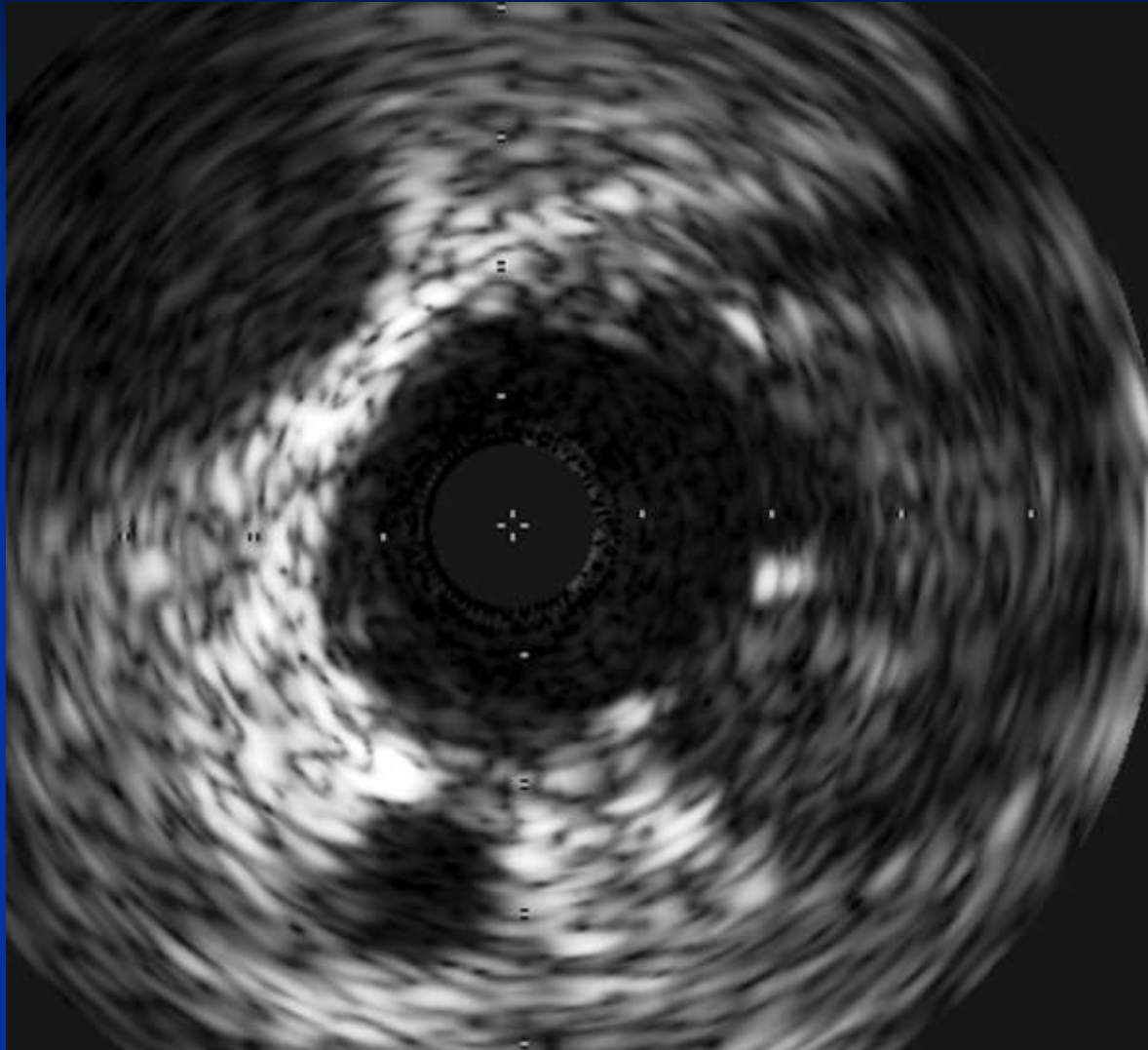


IVUS in  
Diagonal

Phased  
array: no  
wire  
artifact

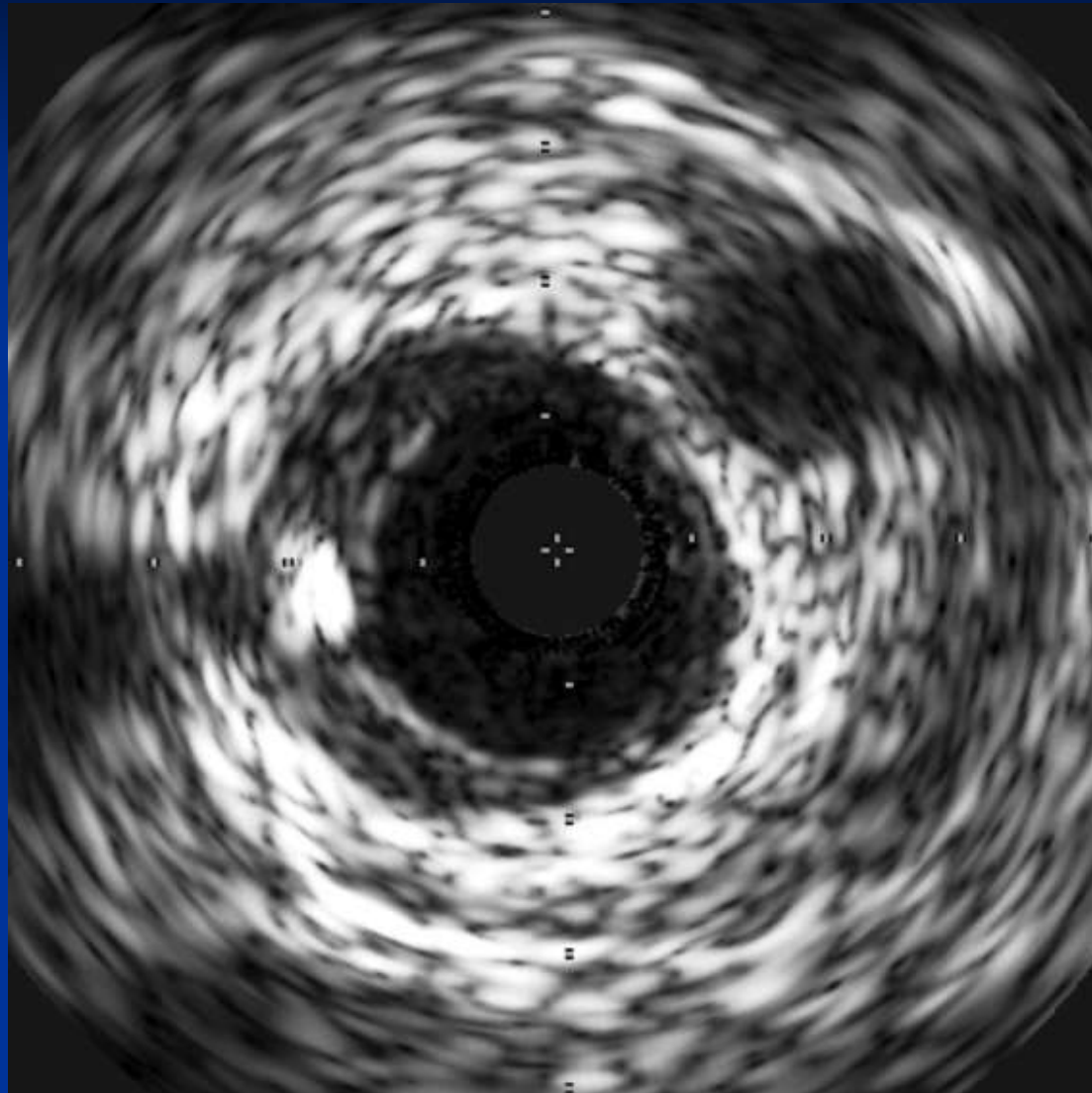


# JP: IVUS guided wire penetration

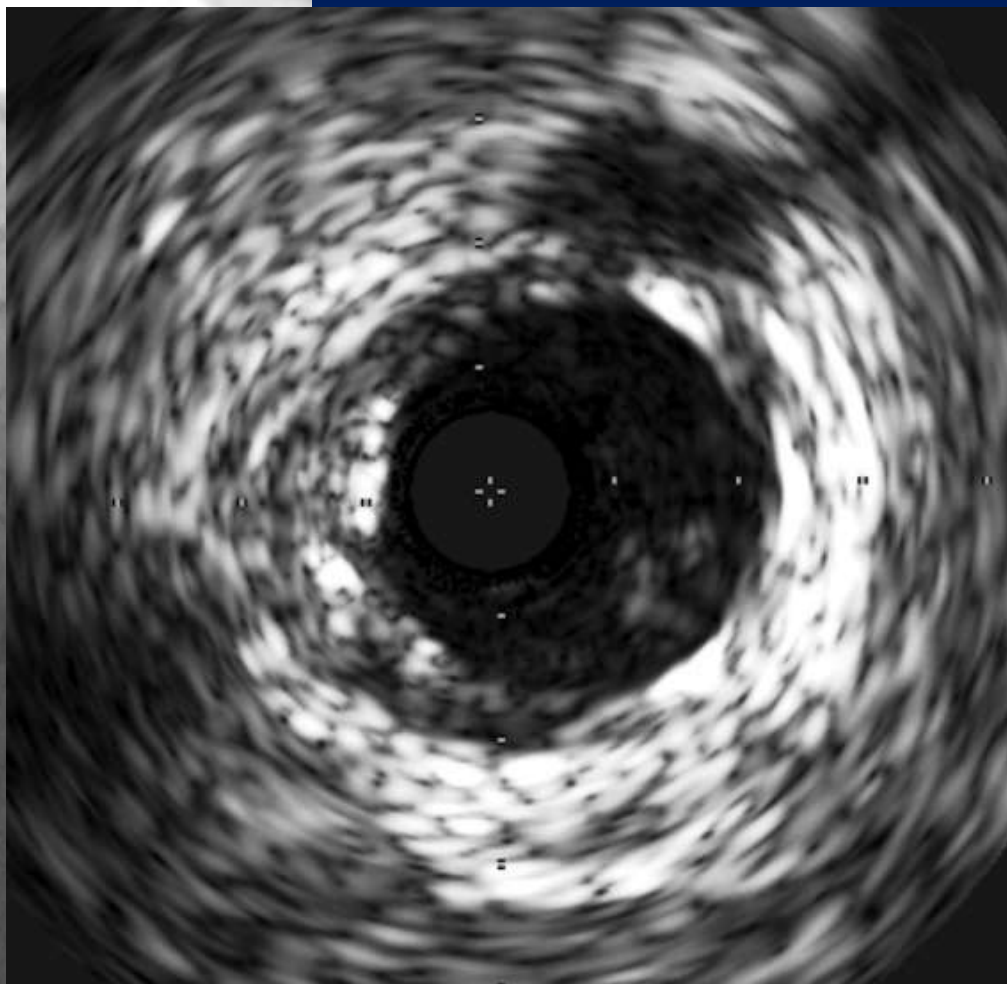
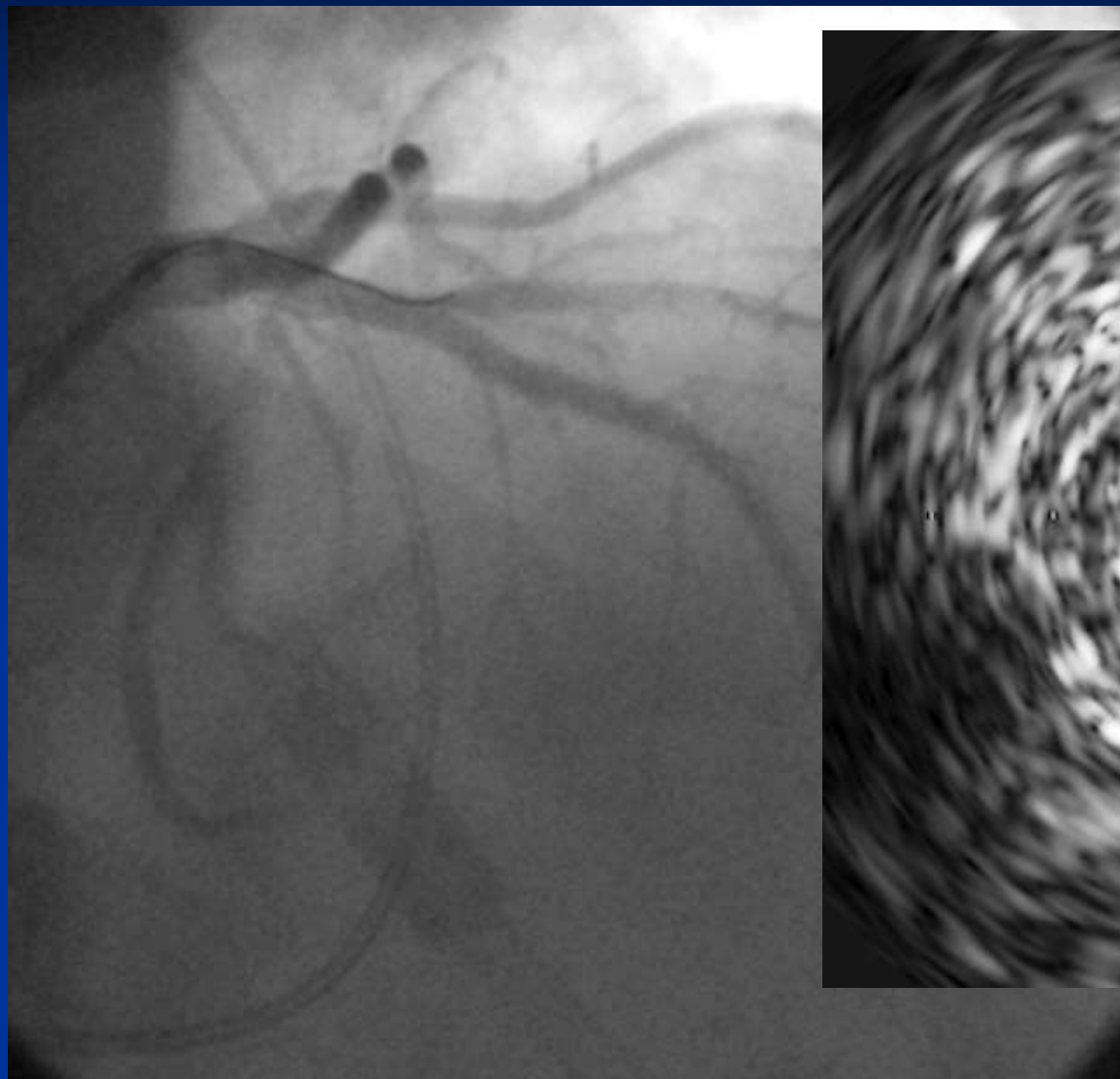


# JP: IVUS confirmed intraluminal

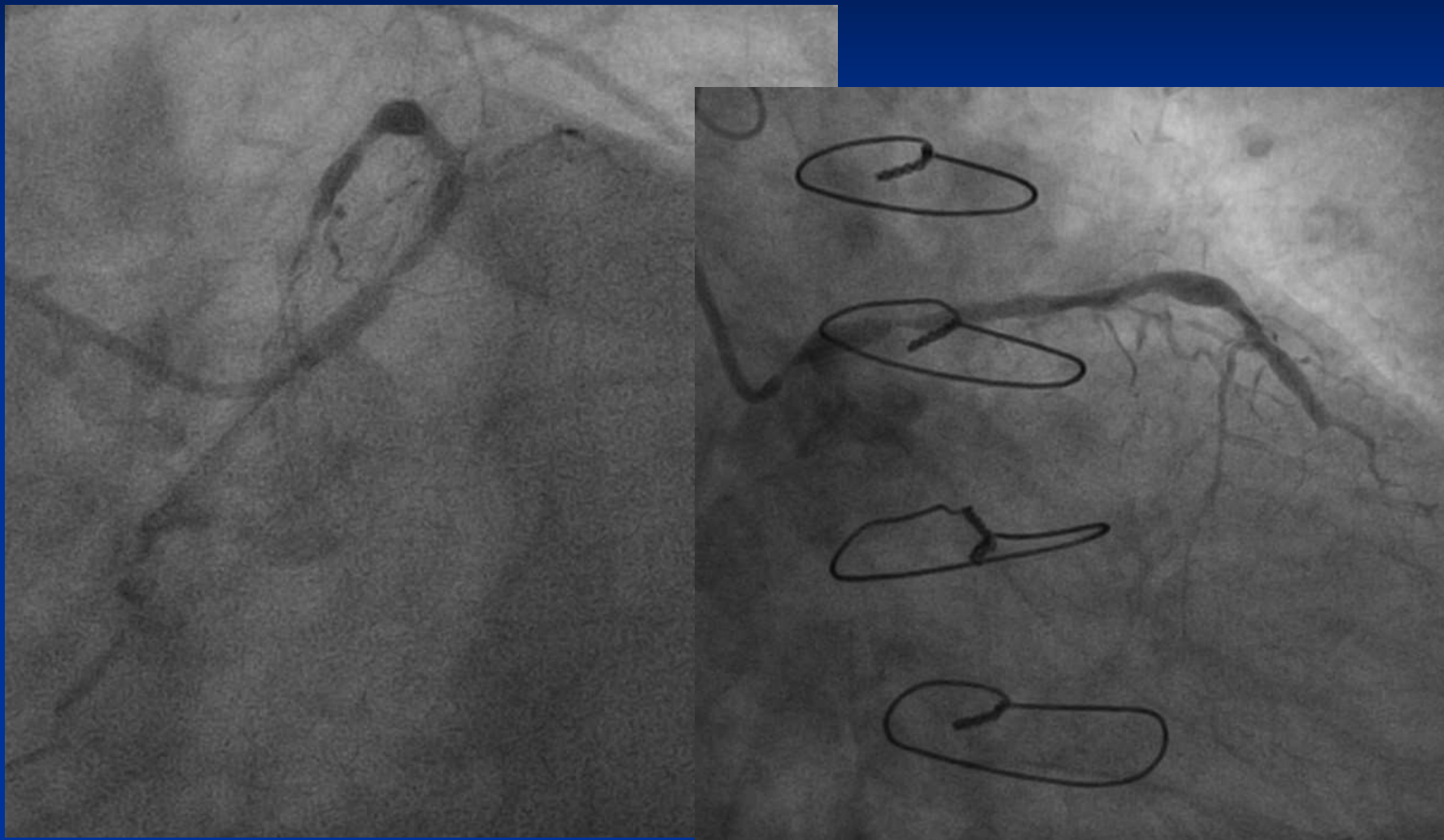
IVUS in  
LAD



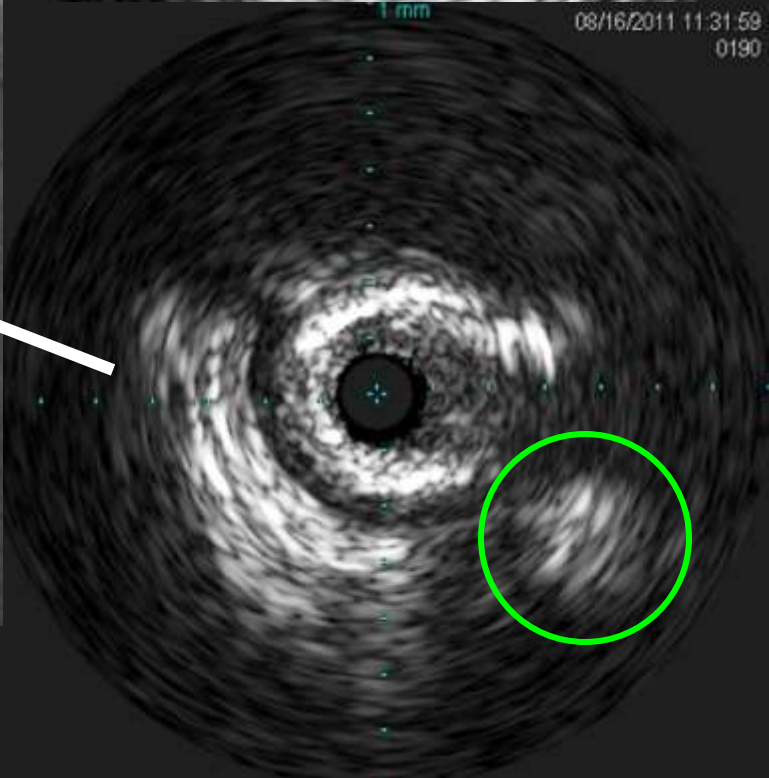
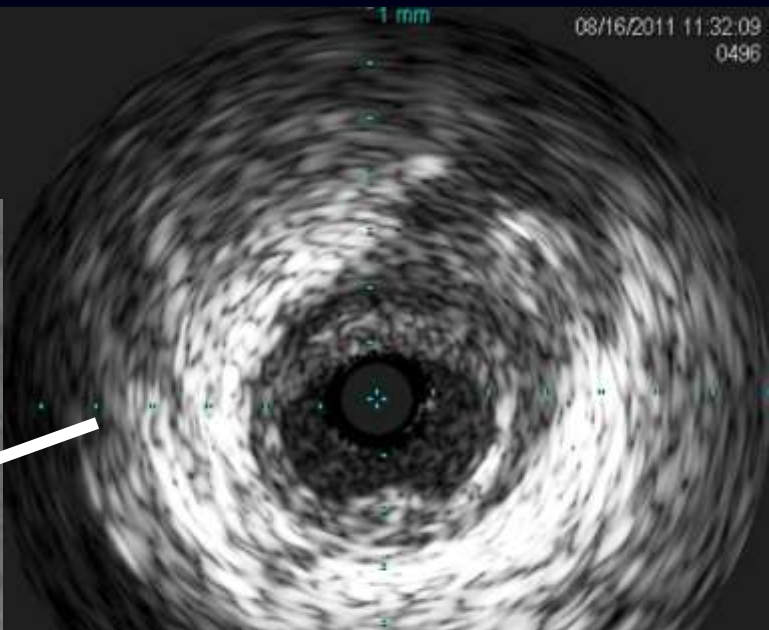
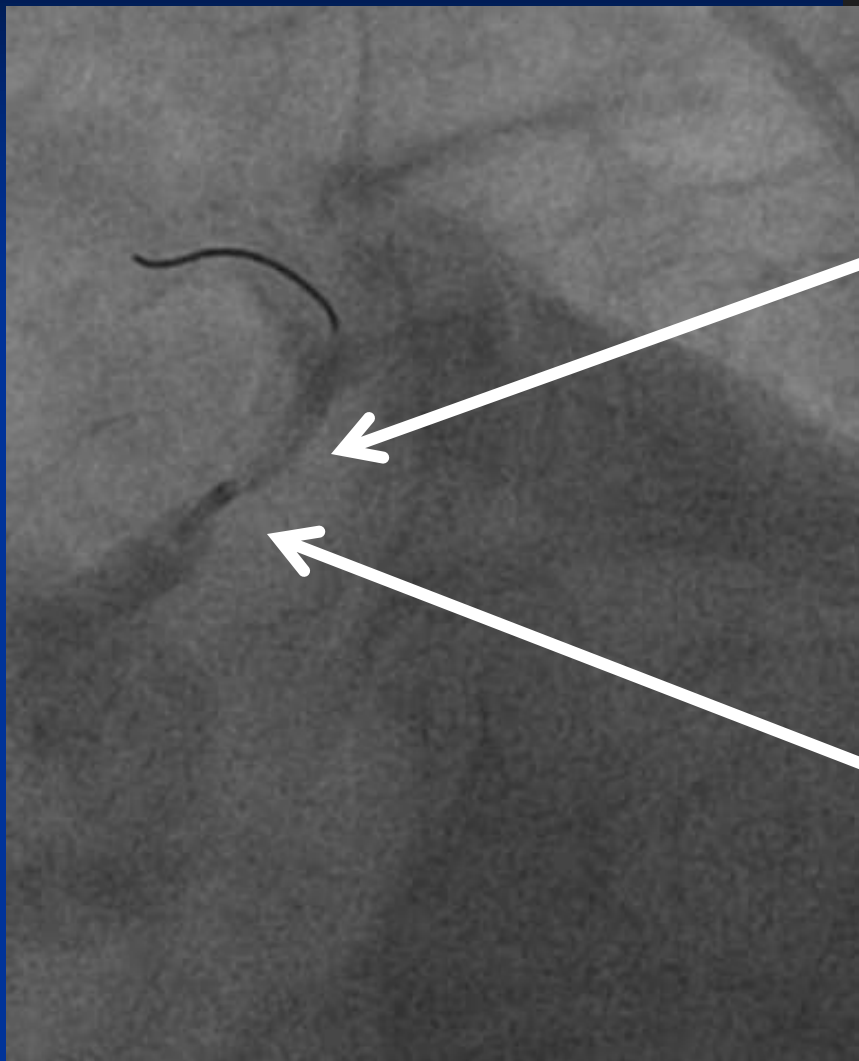
# JP: Final post stenting



# Complex left main stenting: CTO; culottes



# Step 1: find LCX

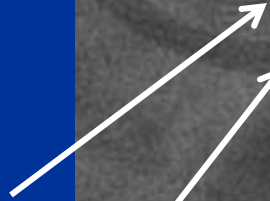


## Step 2: Set up for IVUS-guided cap penetration

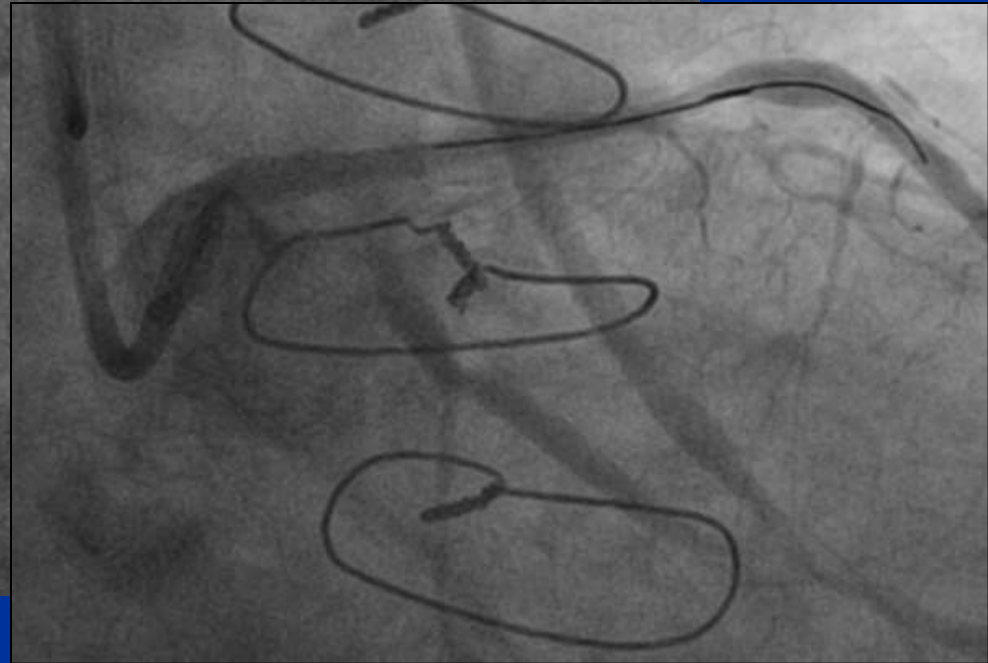
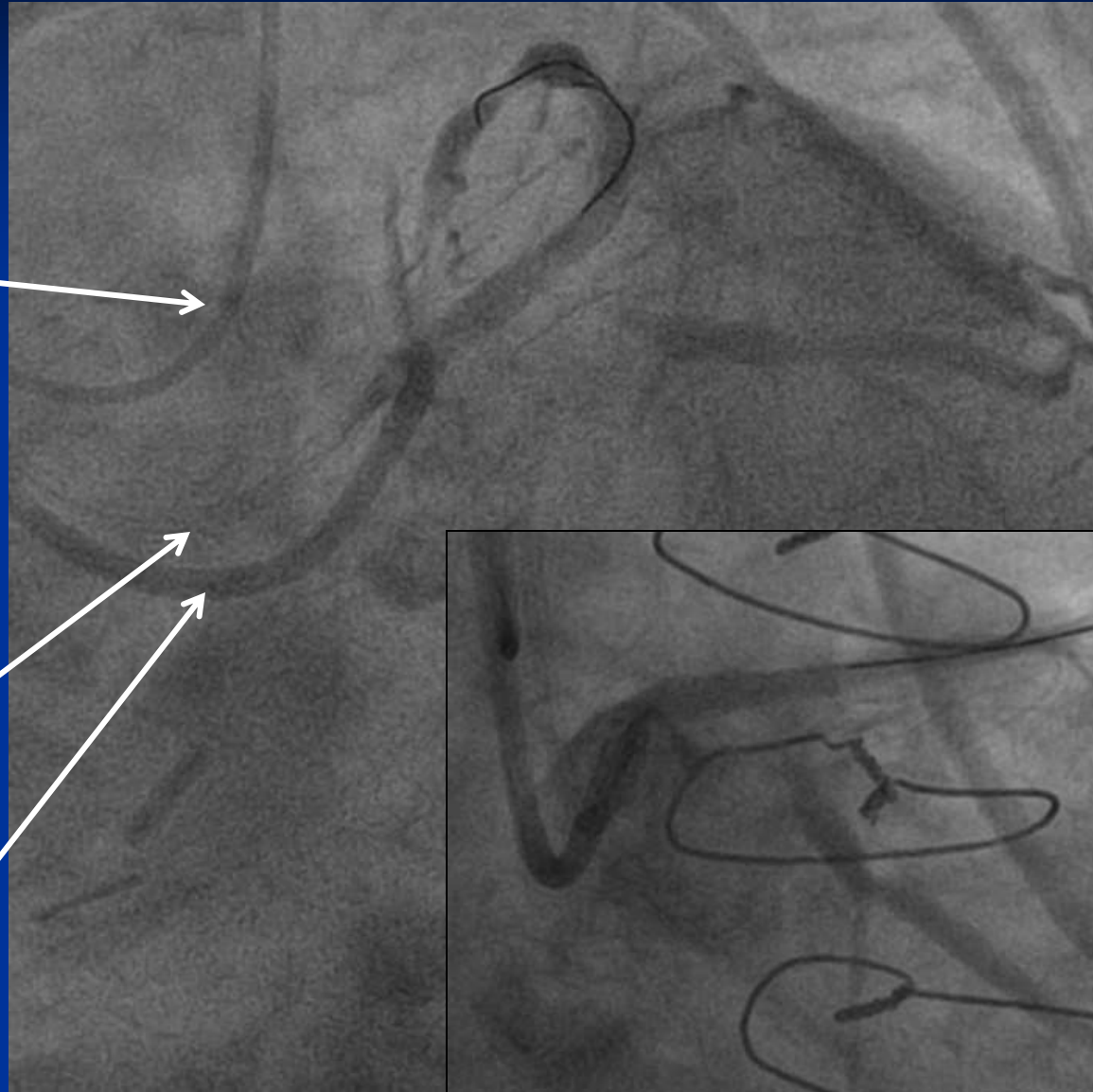
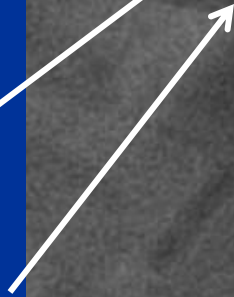
*5 F SVG*



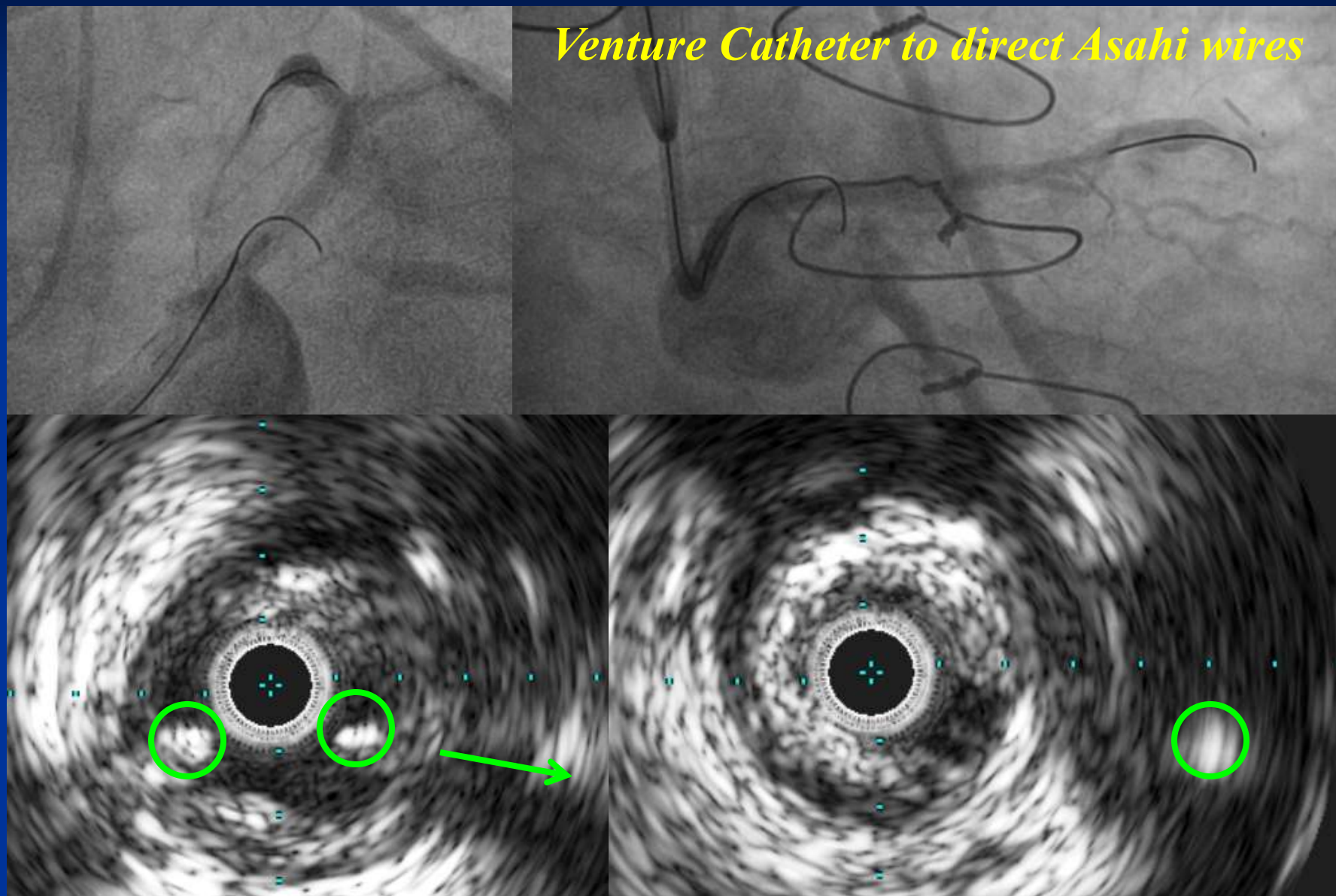
*6 F IVUS*



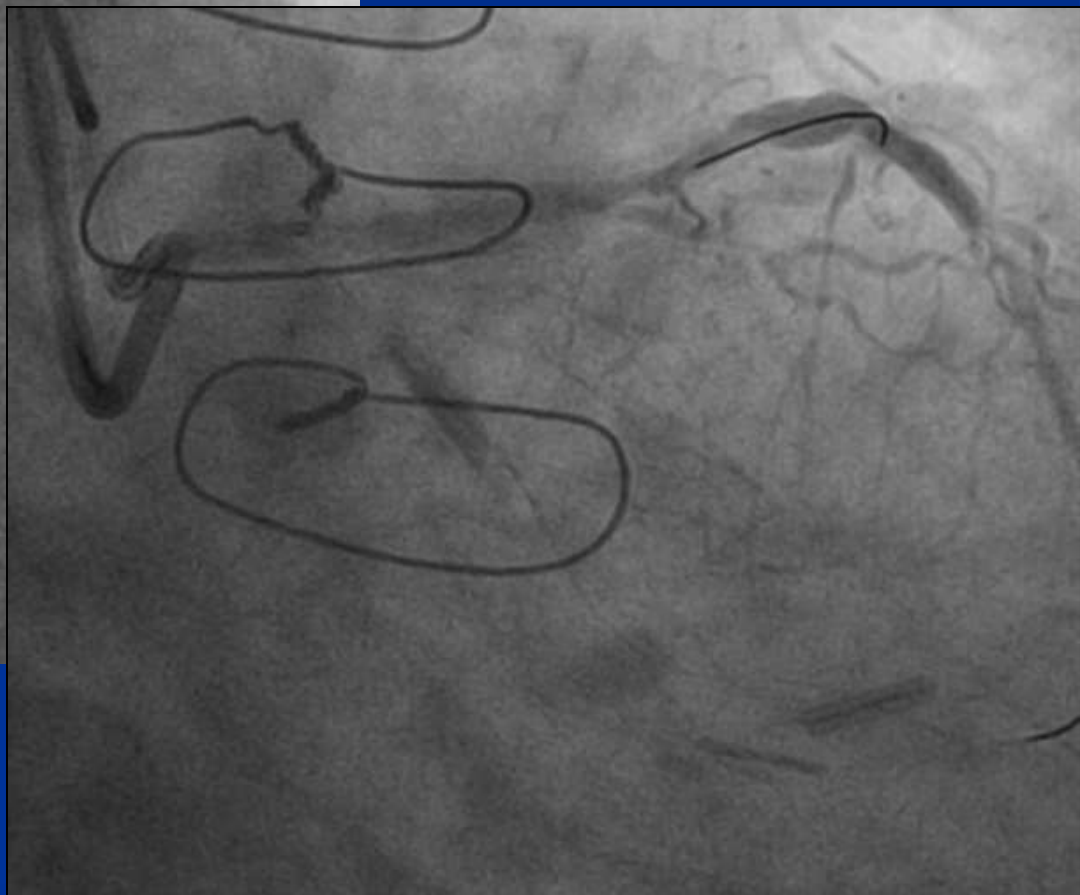
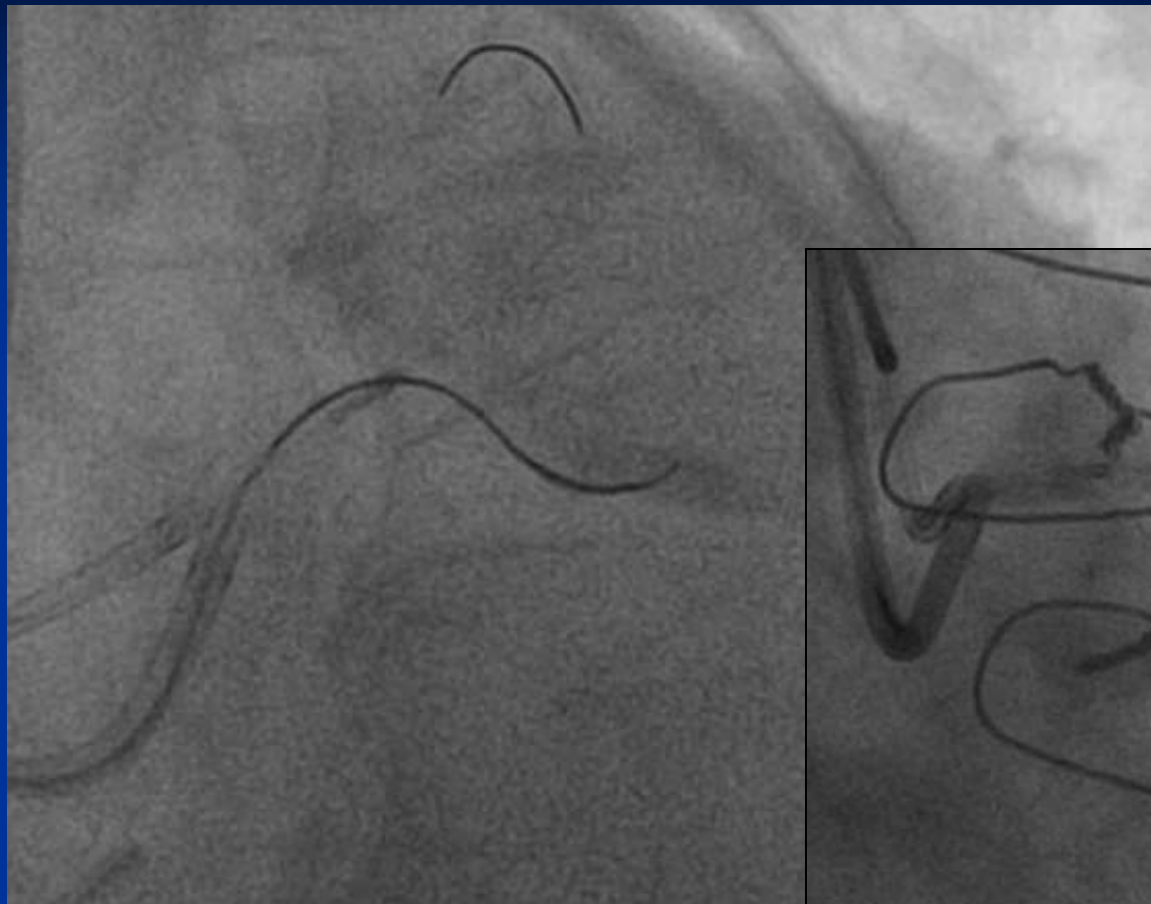
*8 F working*



# Step 3: use IVUS to “watch” wire penetrate cap

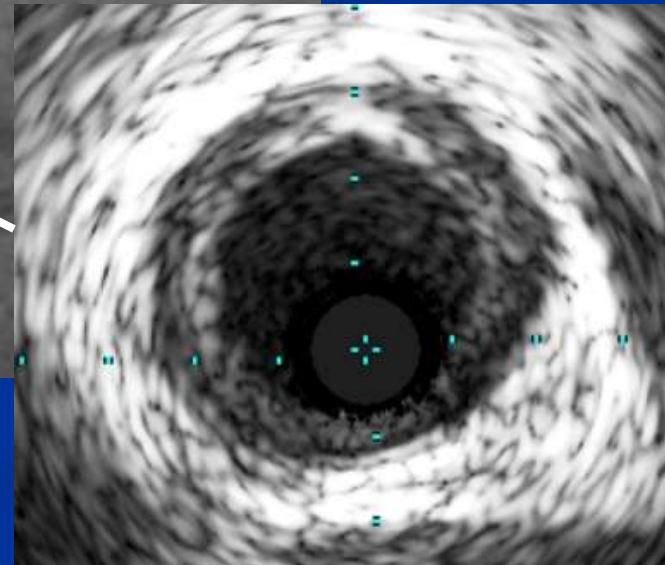
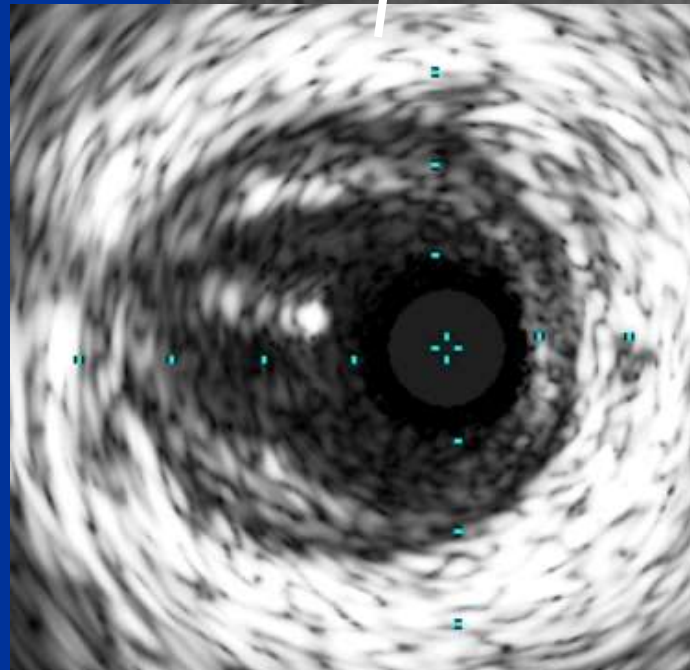


# Step 4: cross into distal LCX





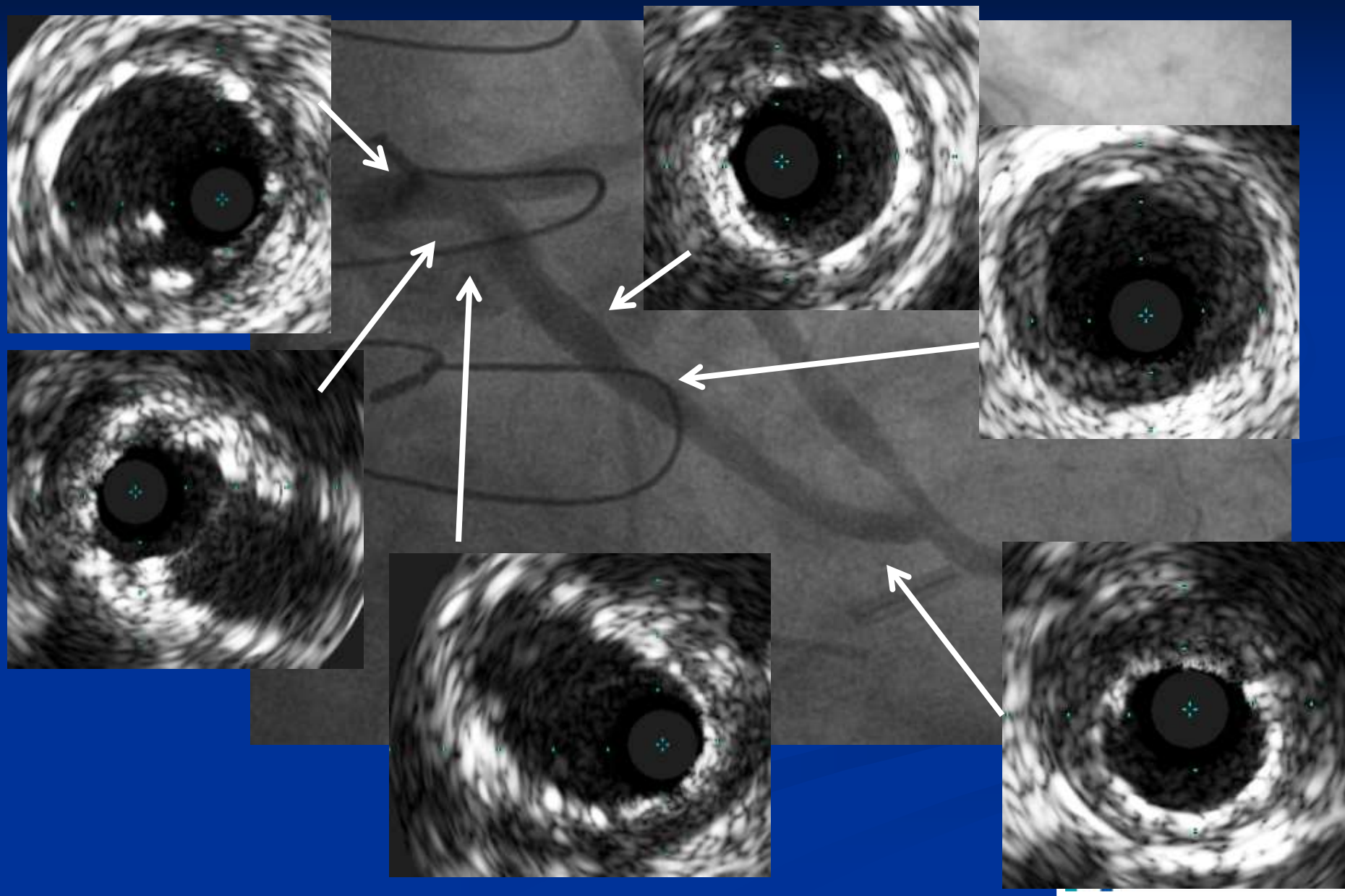
# Step 5: Confirm with IVUS; size stents



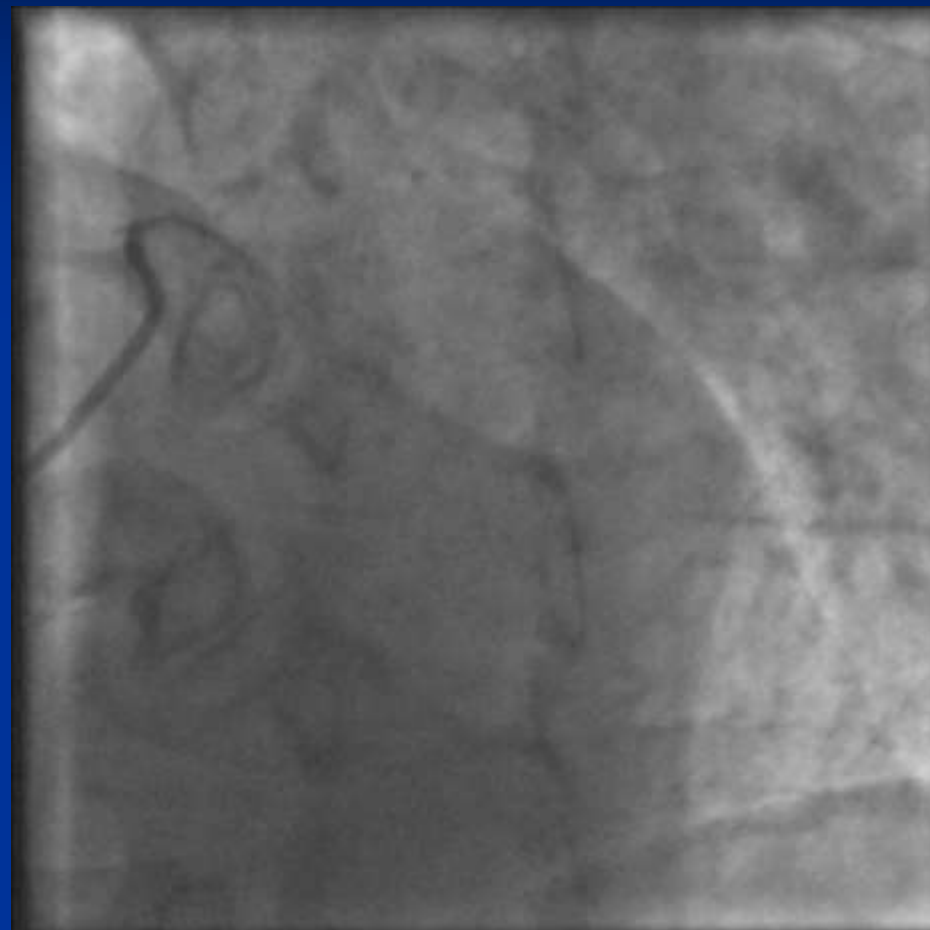
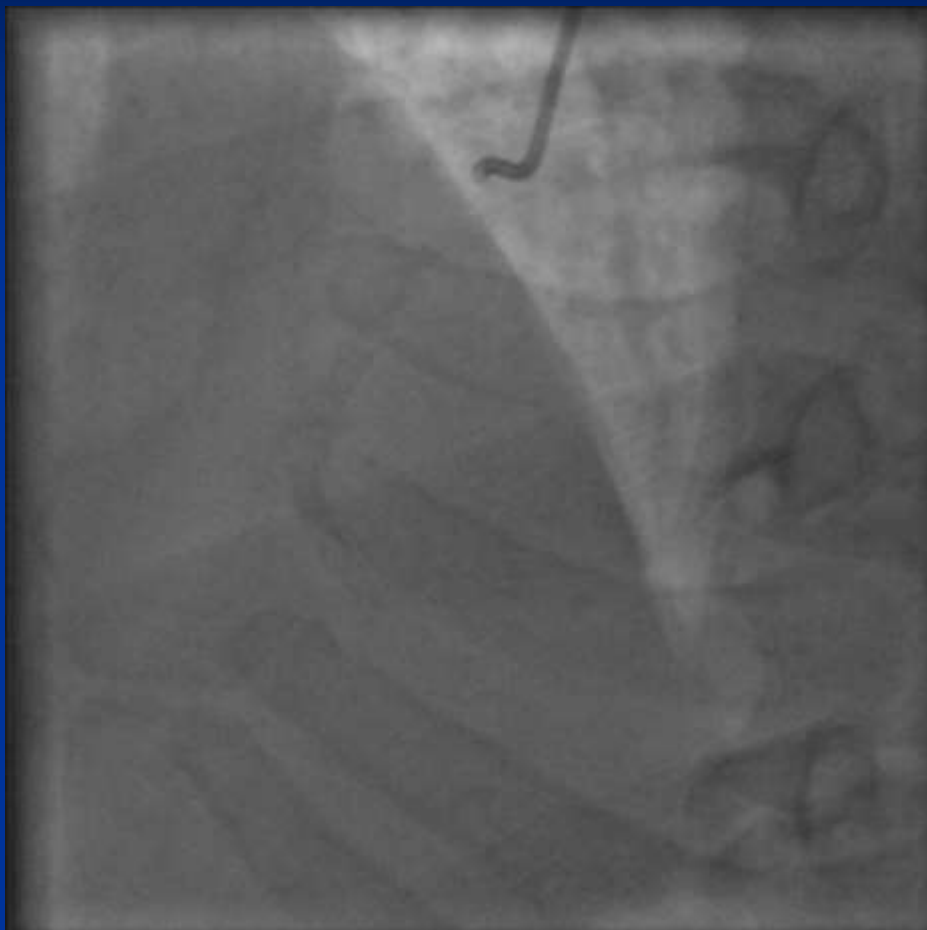
# Step 6: stent LCX to LM; culottes to LAD



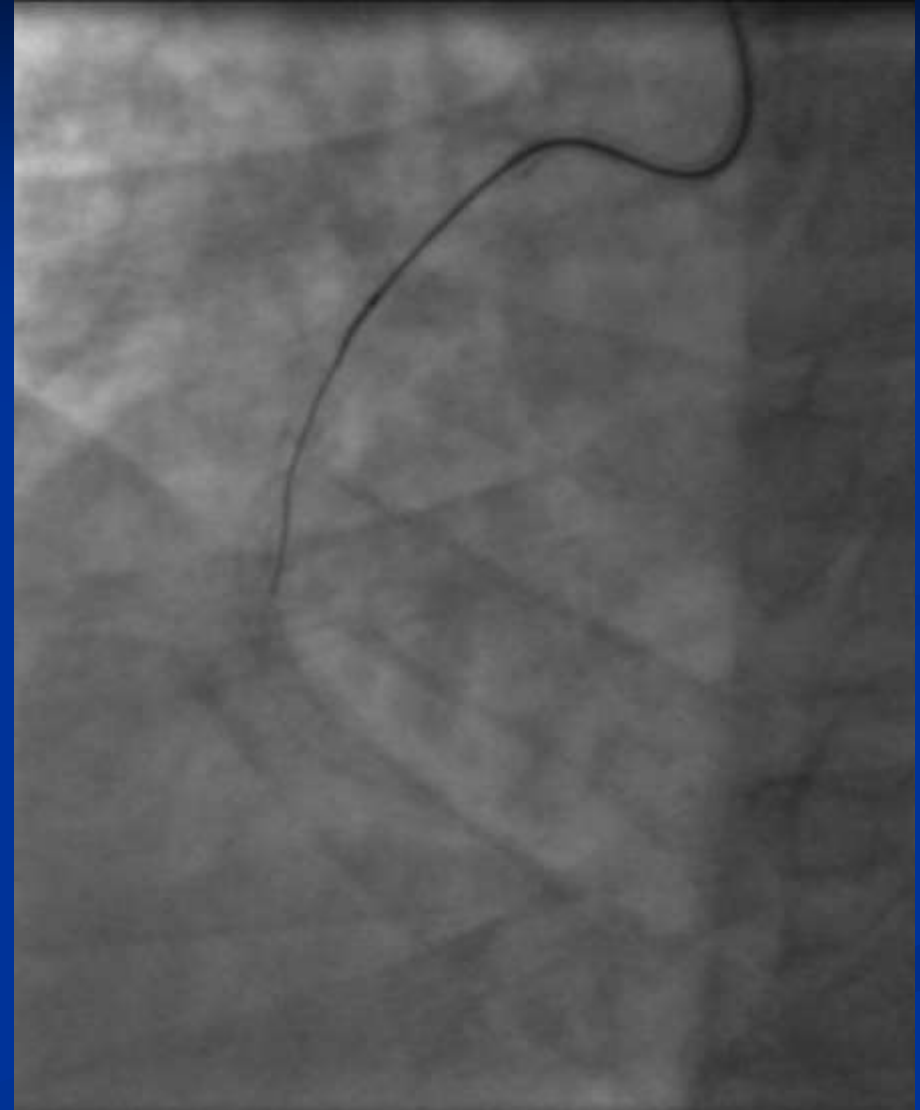
# Step 7: Confirm with IVUS



# SB: RCA ISR CTO



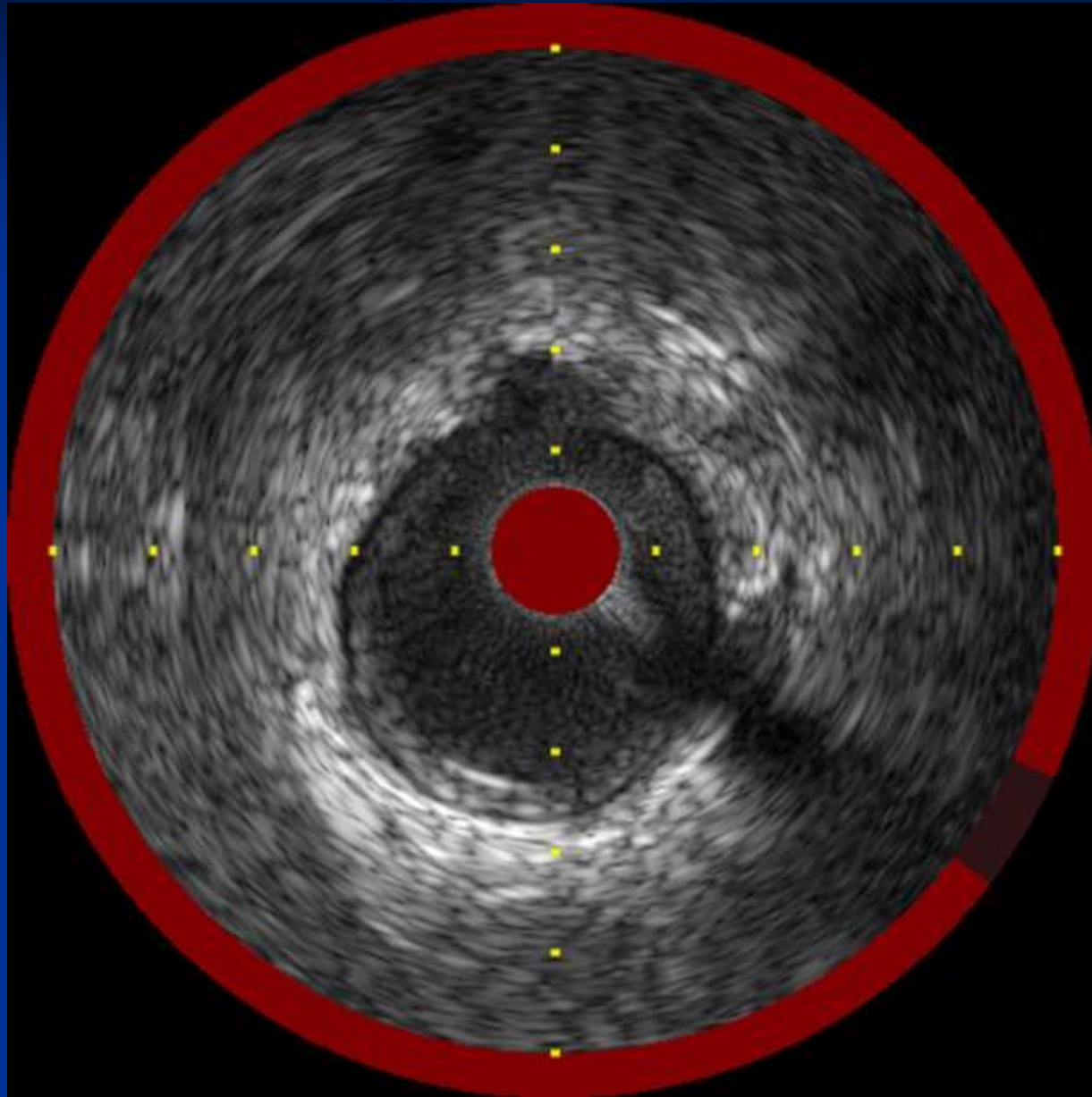
# SB: Corsair, Gaia 2nd



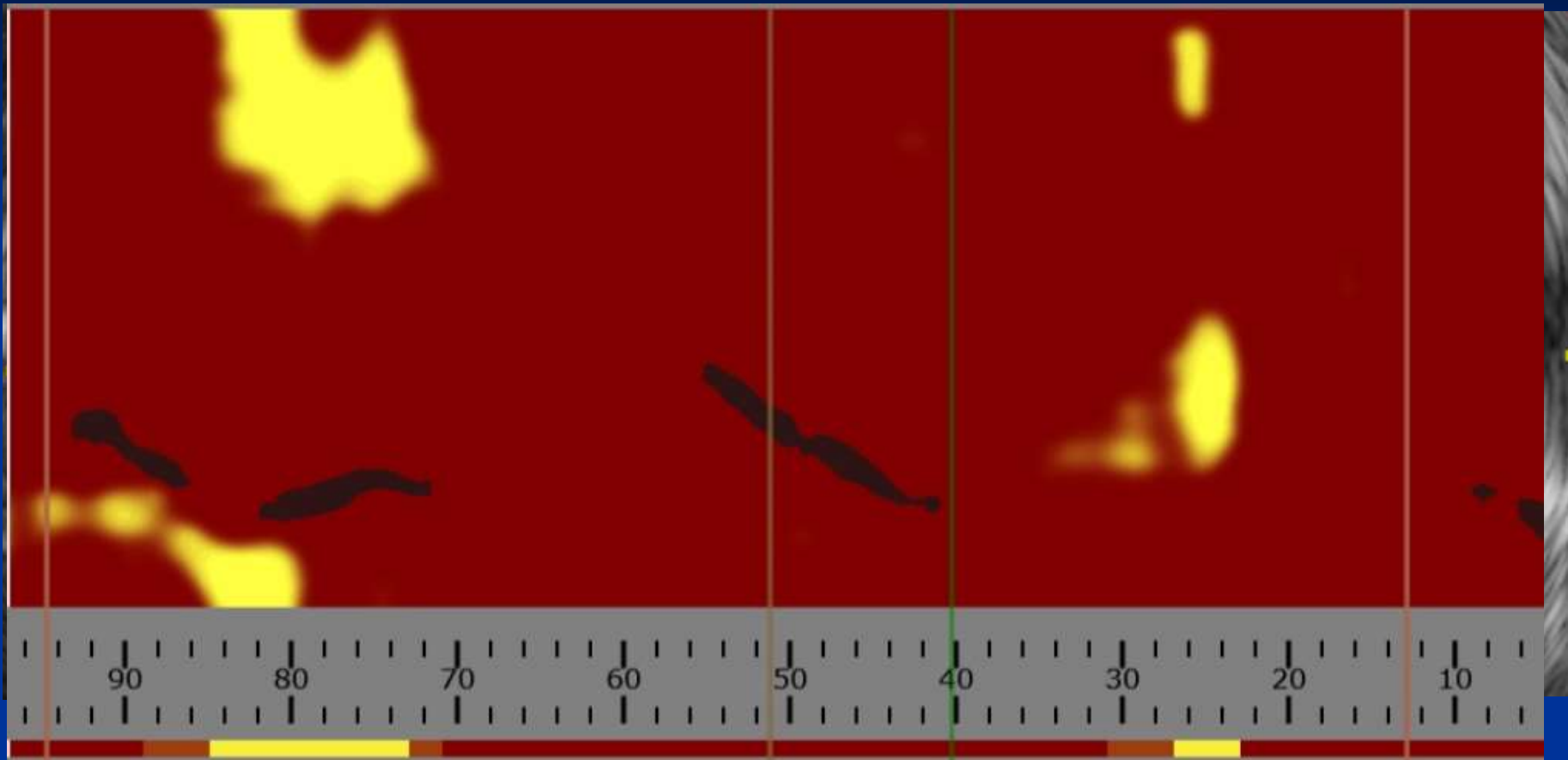
SB: MB12 to penetrate distal cap



# SB: Pre IVUS



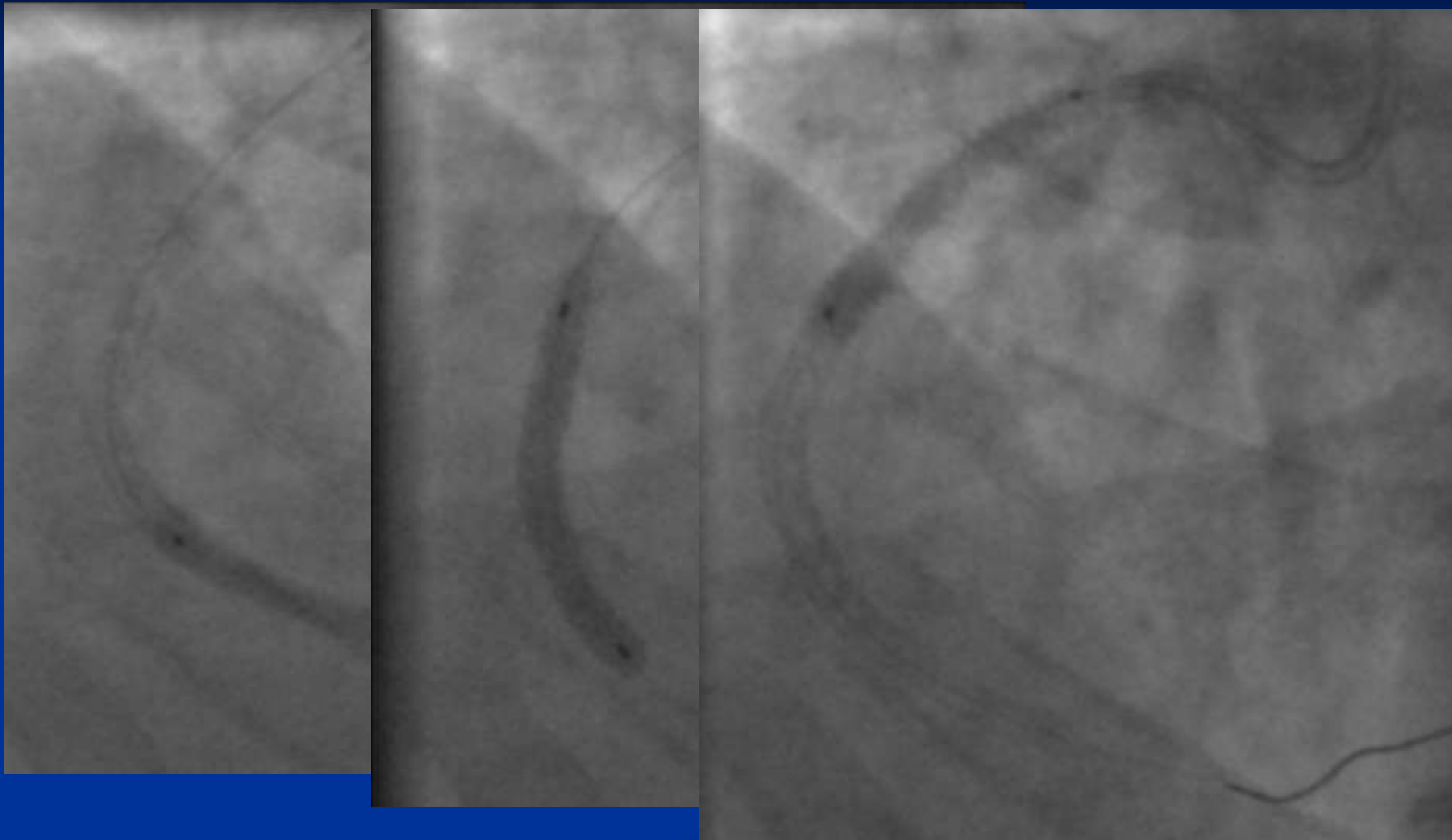
# SB: Stent sizing & coverage



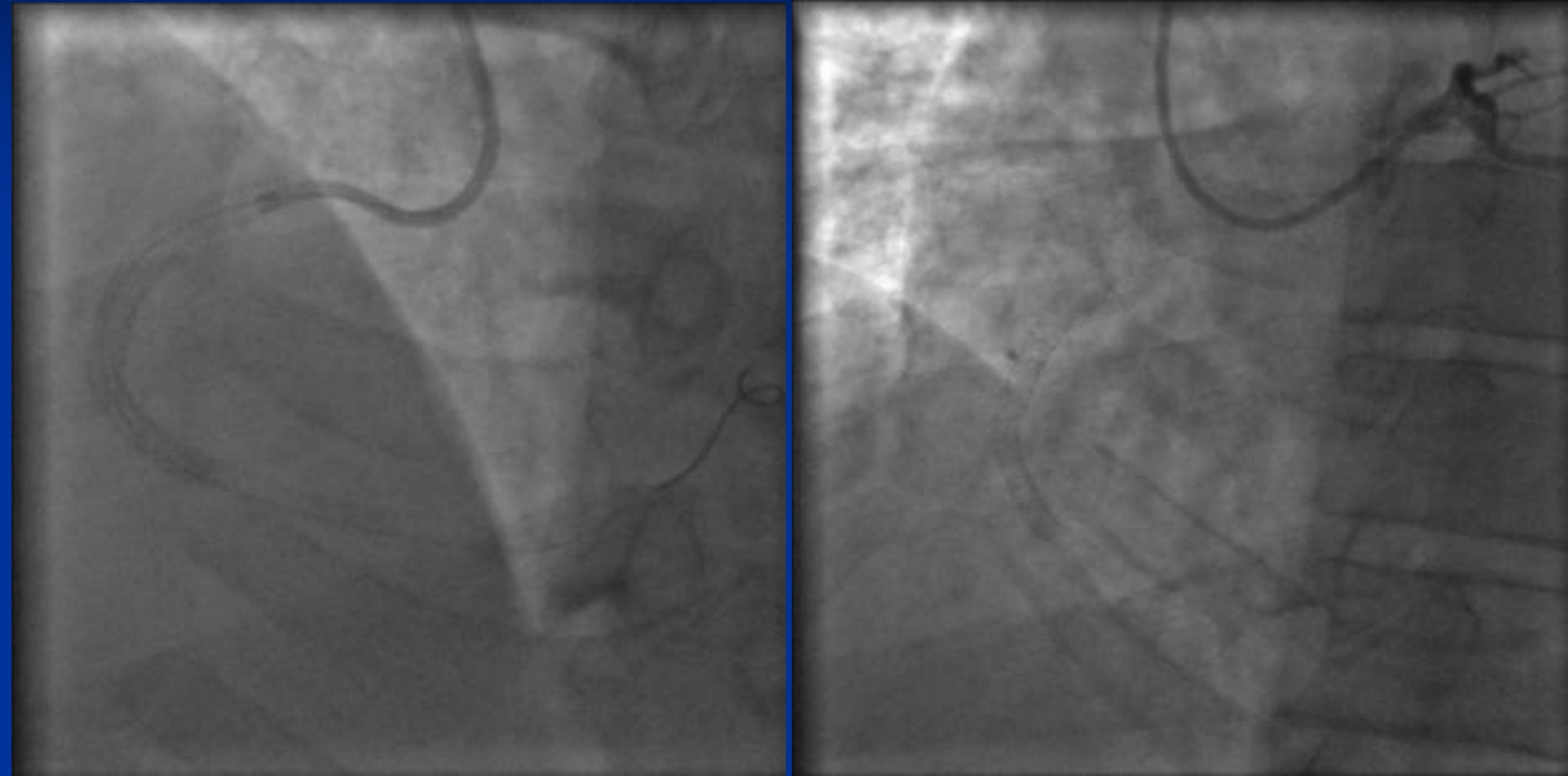
Original stent



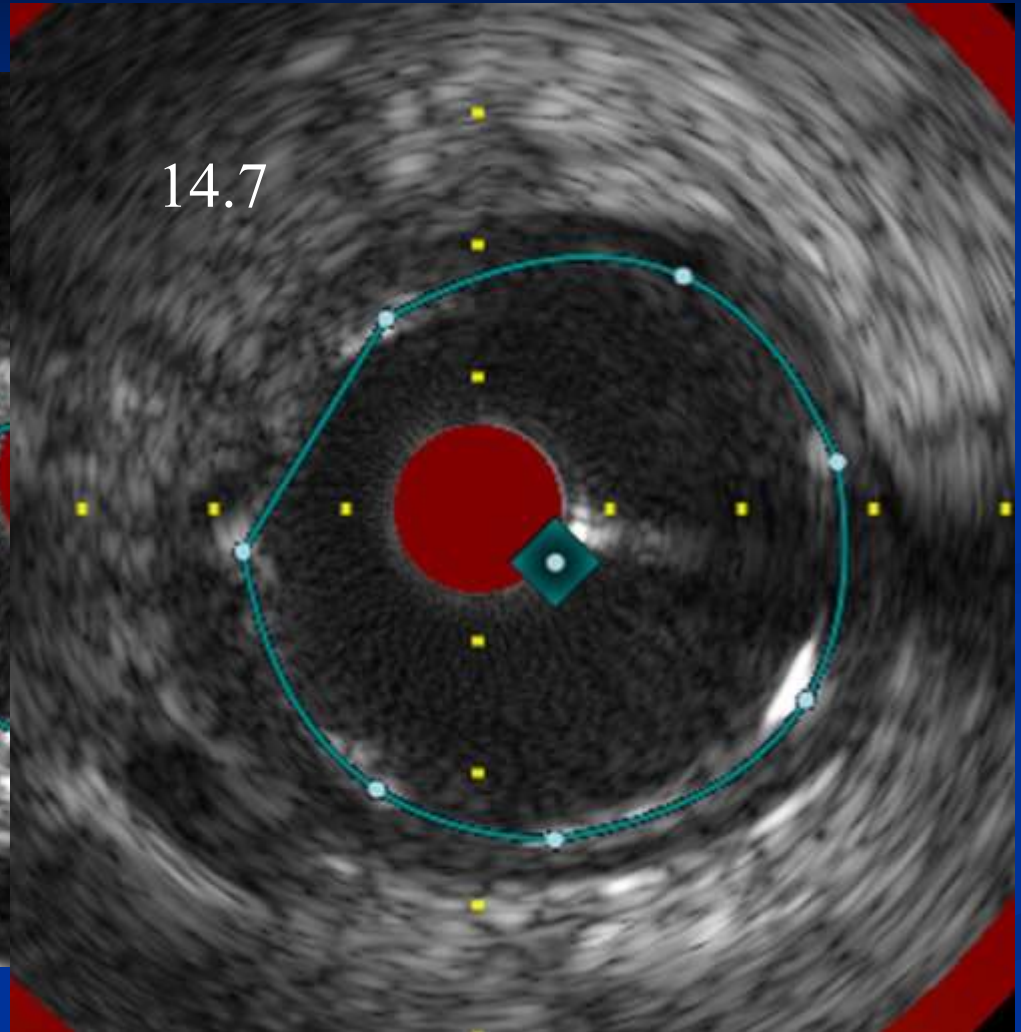
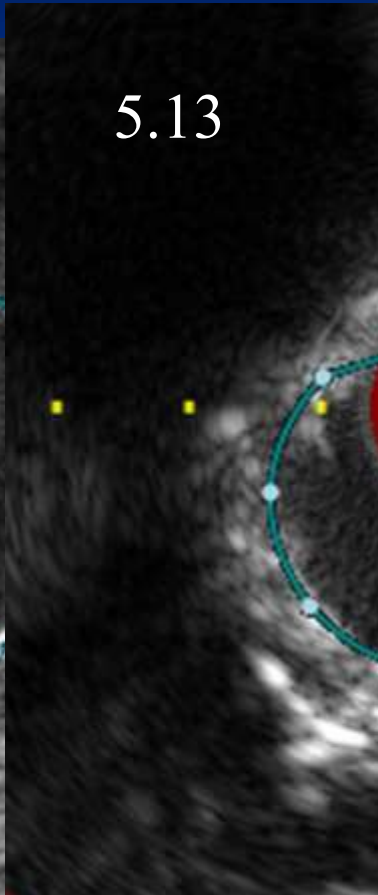
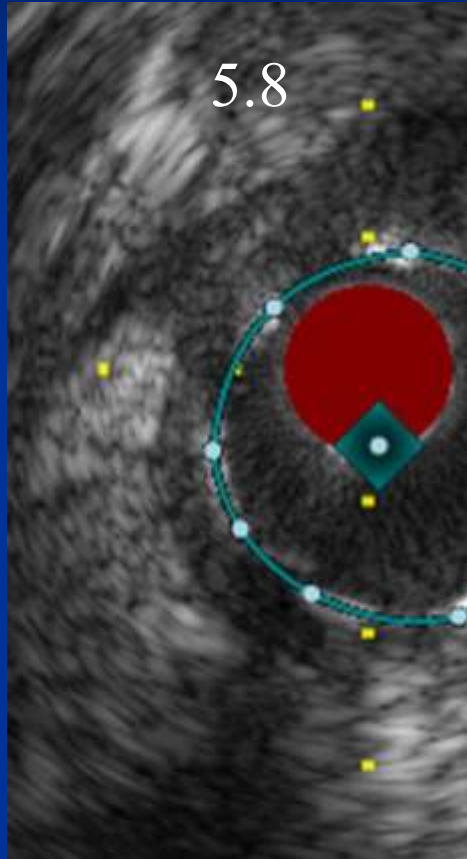
# SB: stents placed



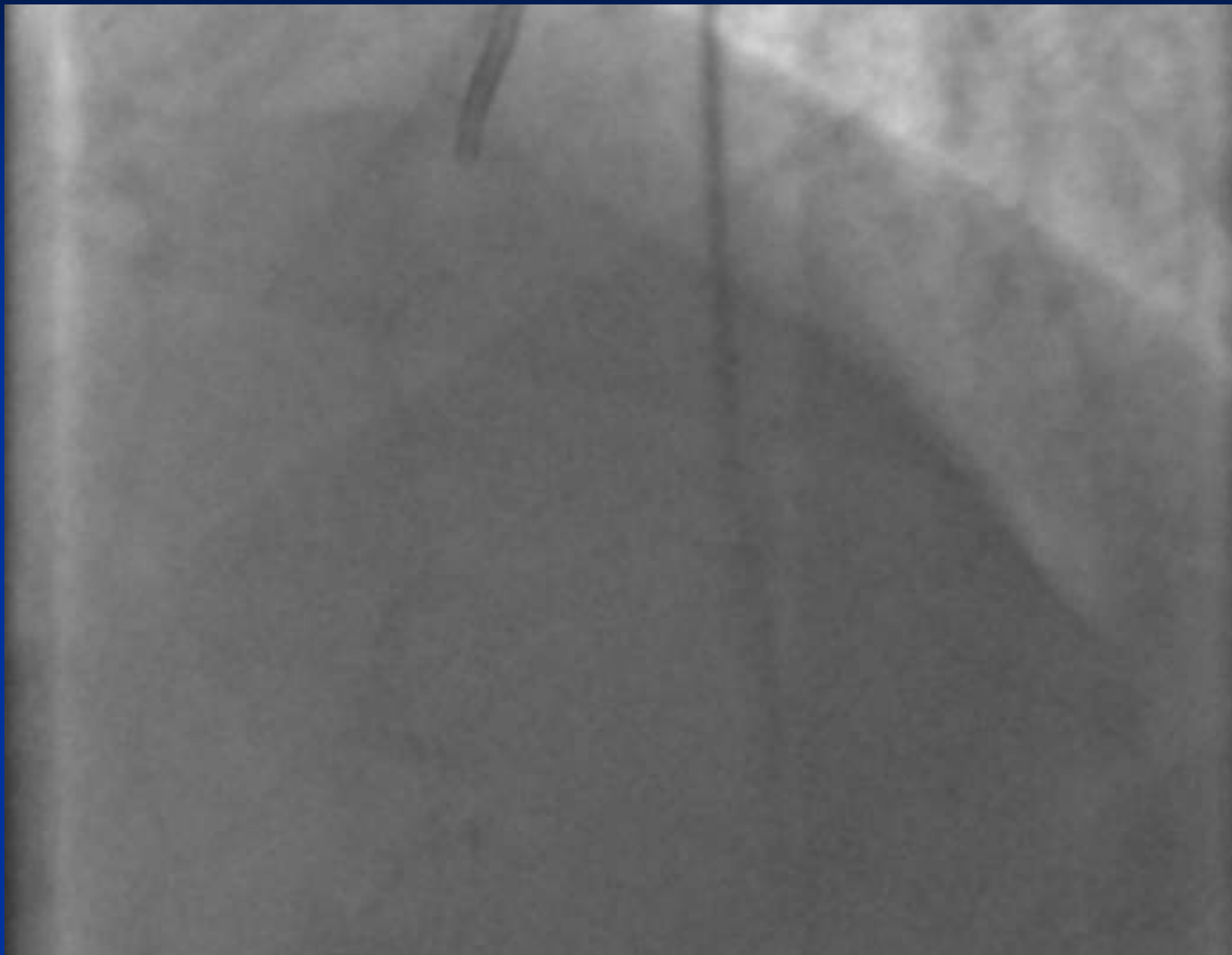
# SB: final angio



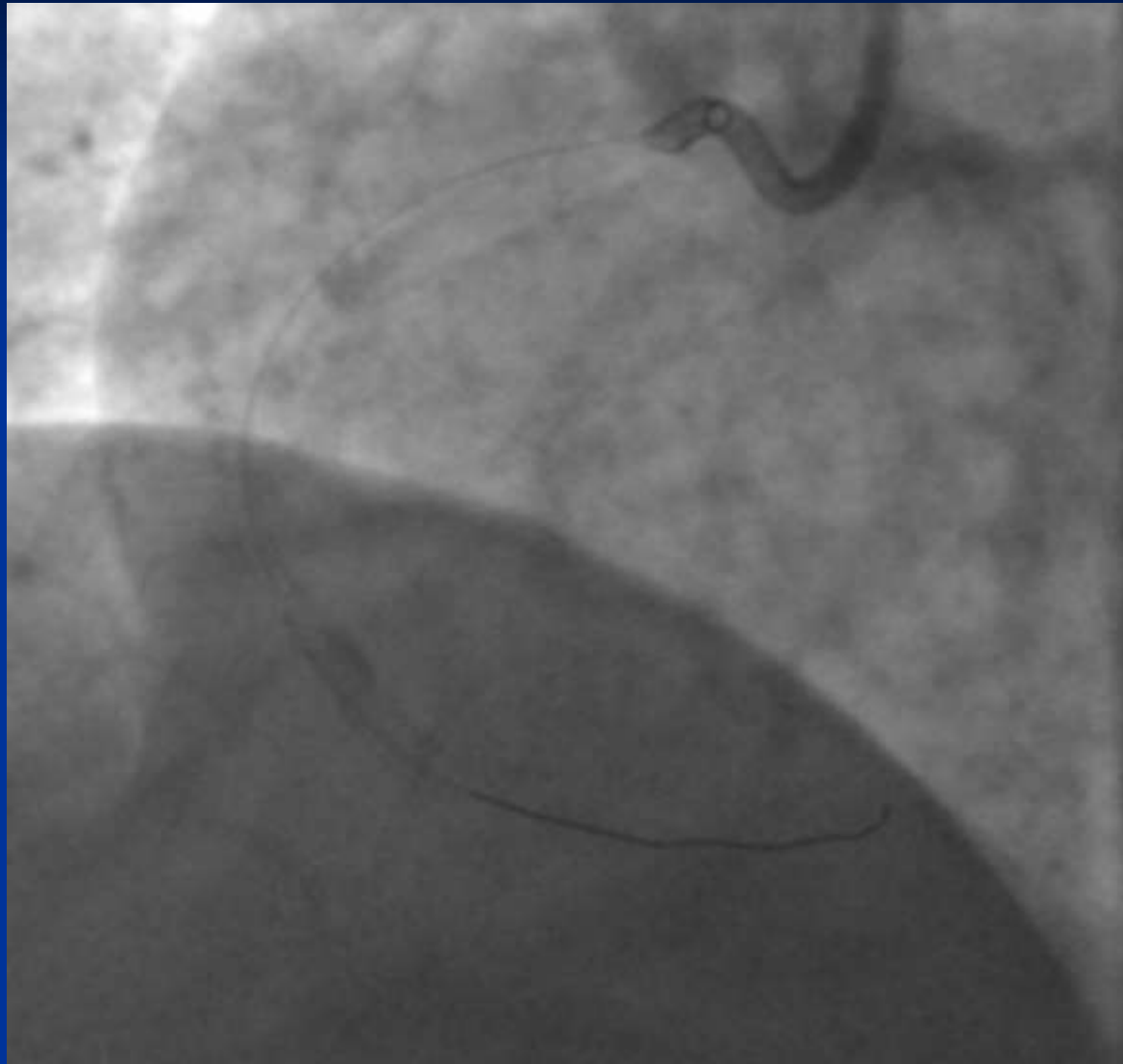
# SB: final measures



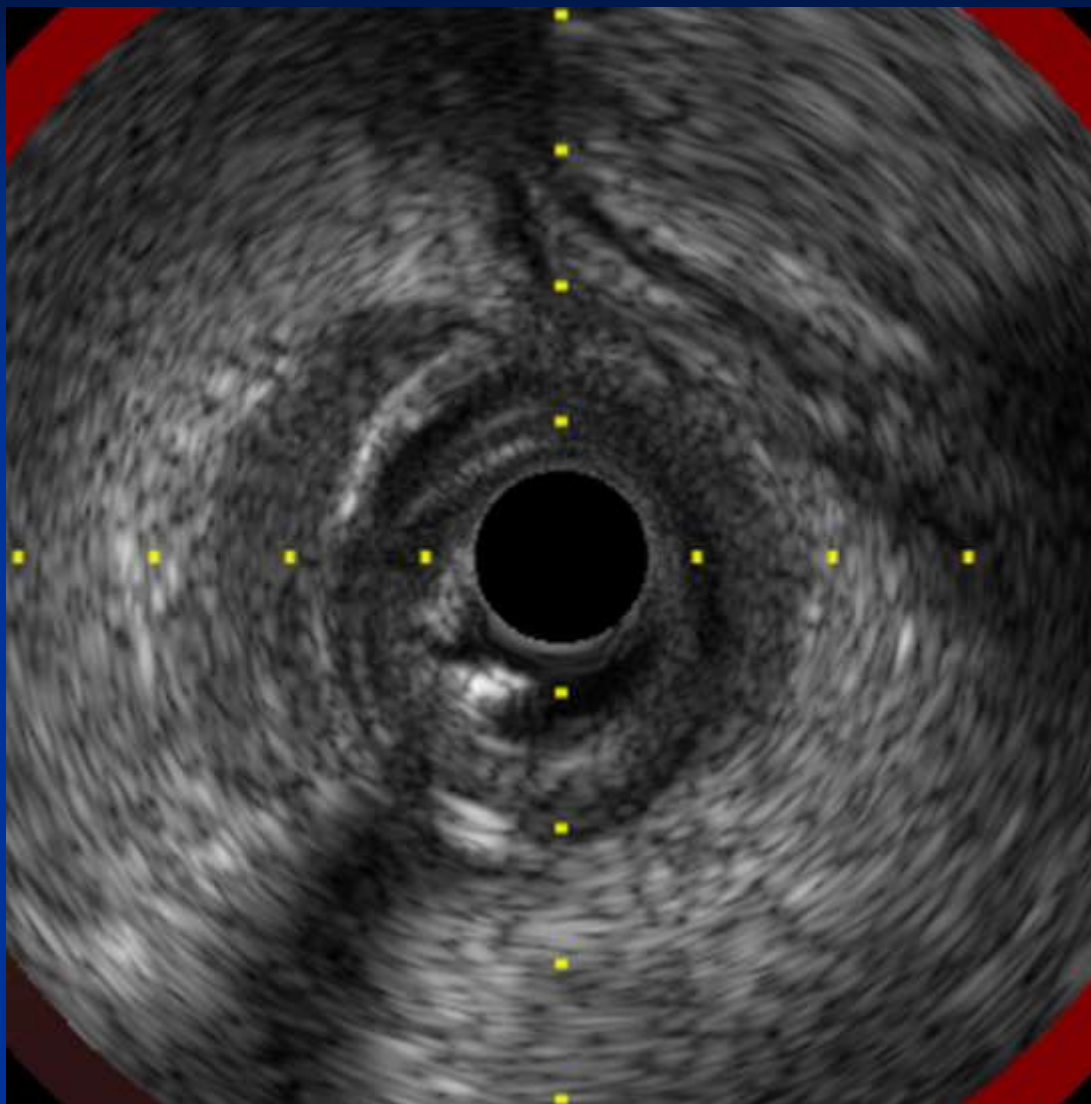
WN: RCA pre



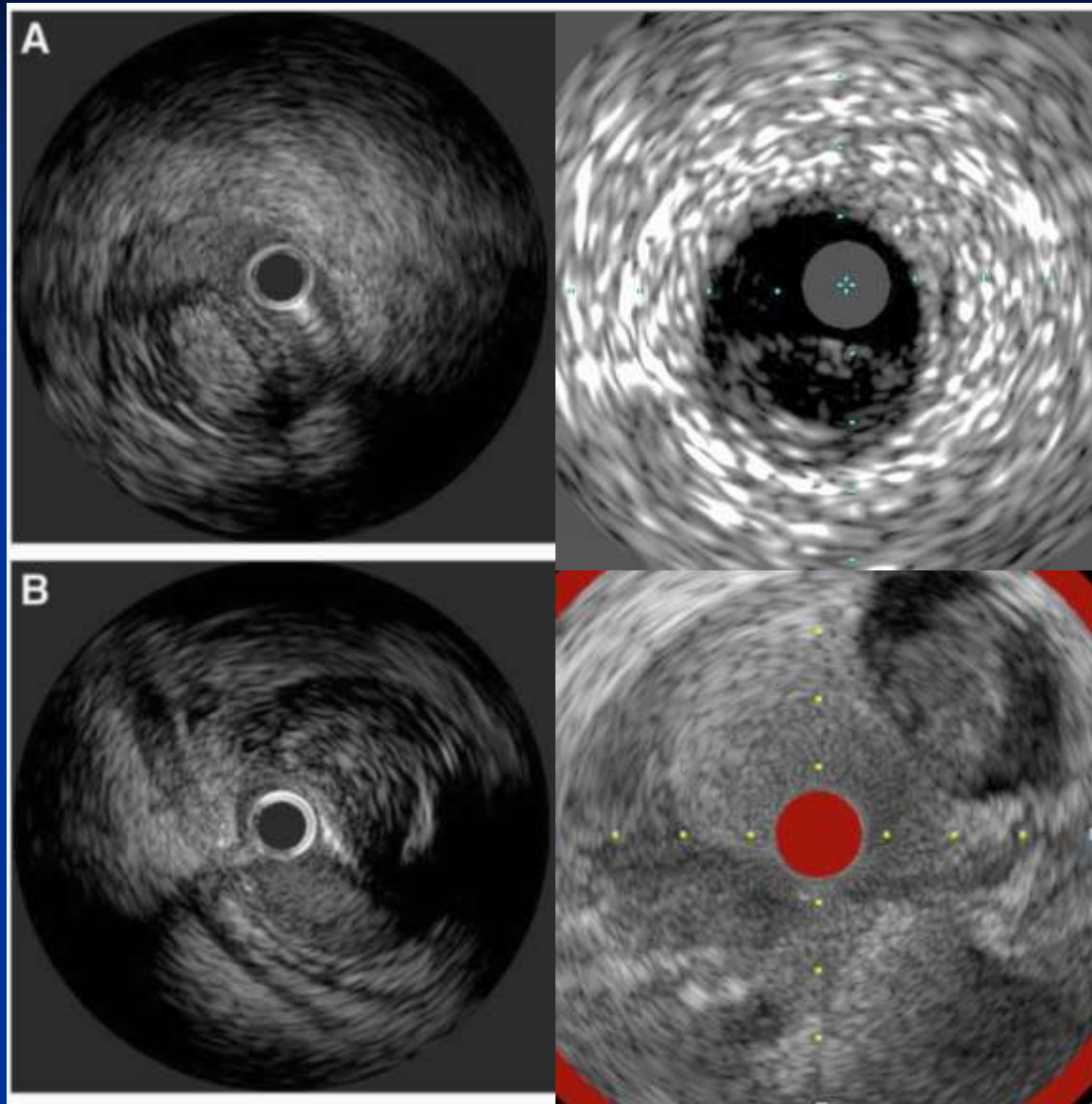
WN: after subintimal tracking and Stingray re-entry



# WN: IVUS to assess subintimal course

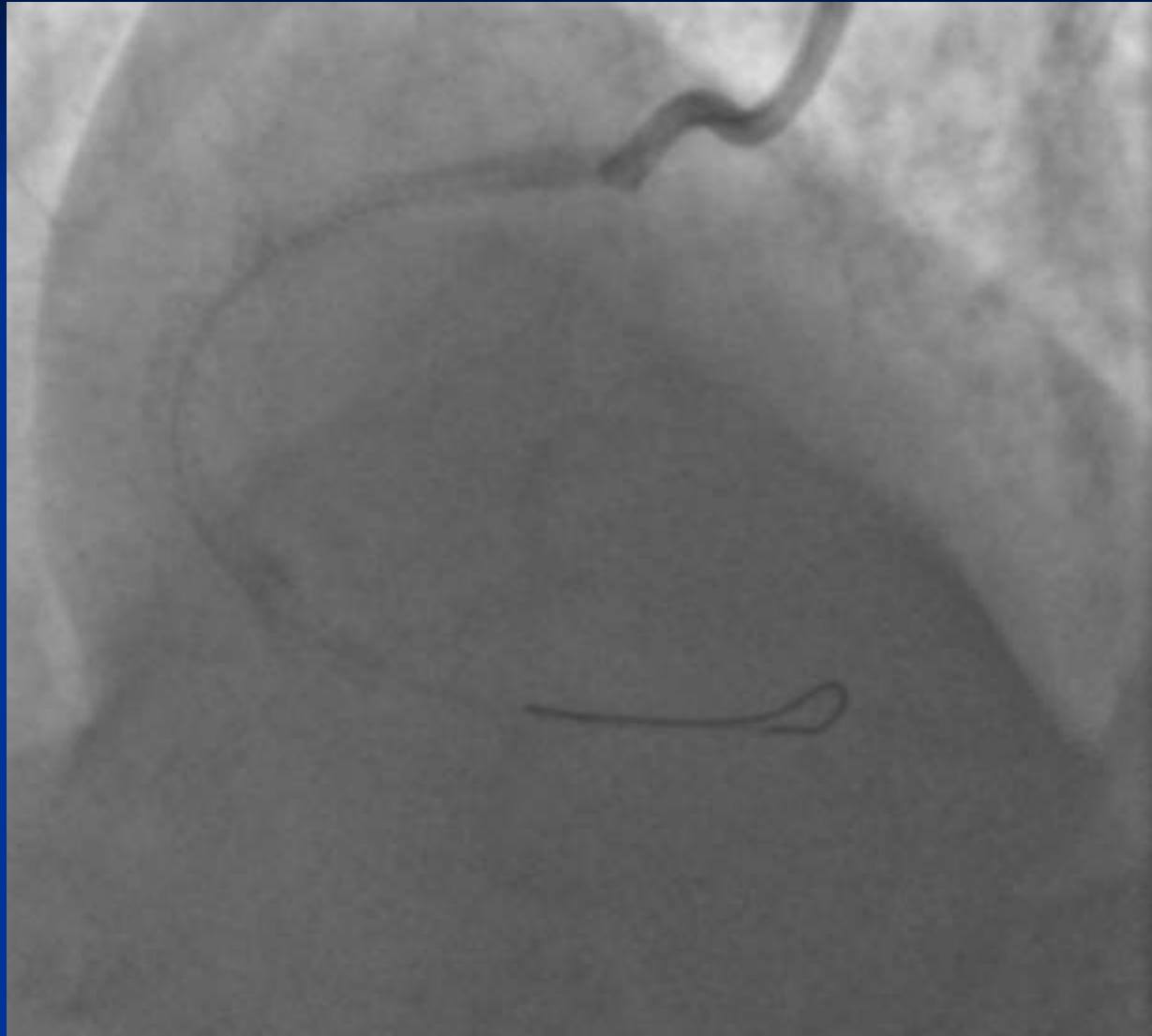


# Subintimal Imaging



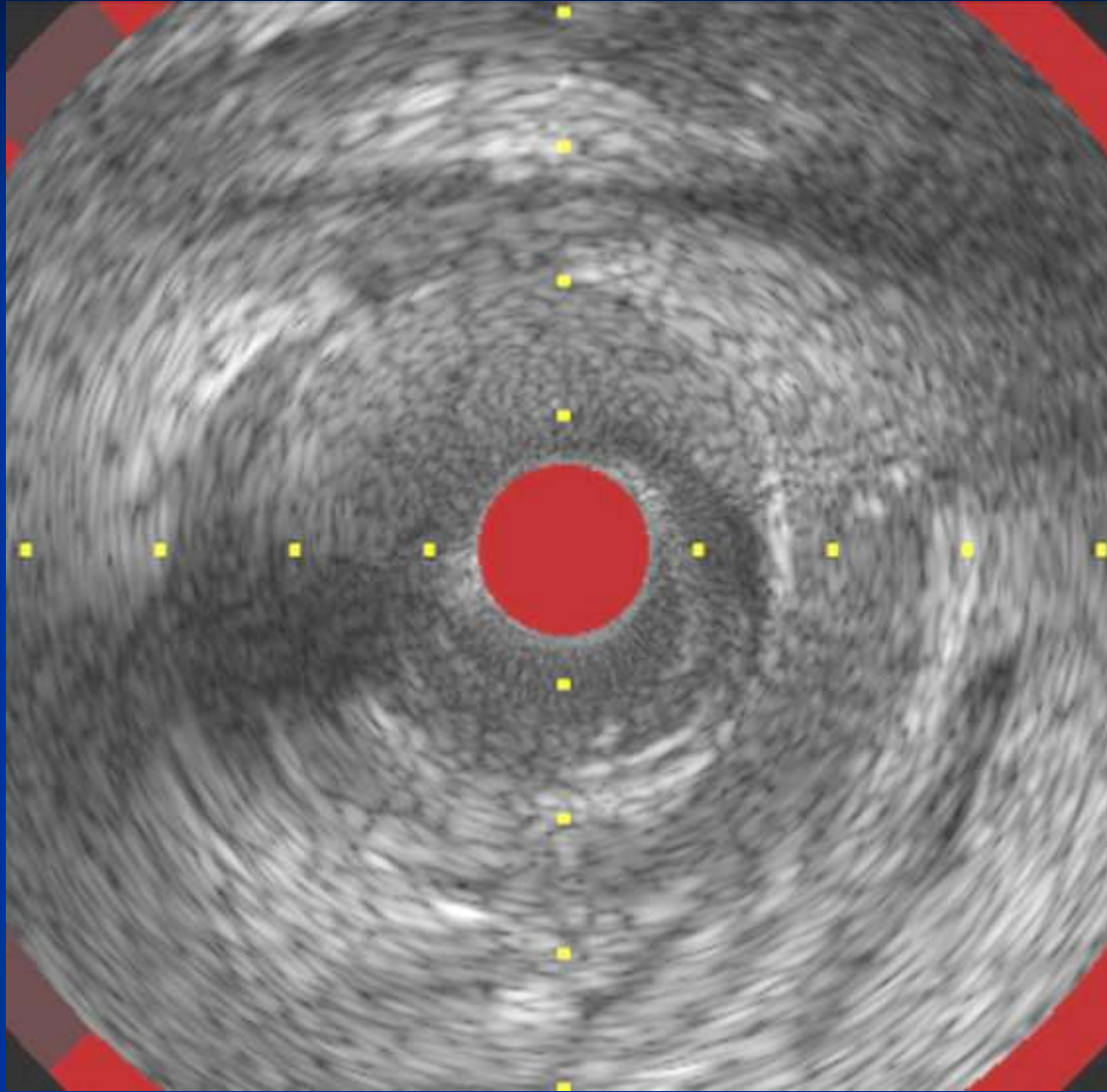
Muhammad et.al. CCI 2012;79:43

# WN: Final angio





# WN: Final IVUS



# Take Home Points

- IVUS is critical for CTO intervention:
  - Ensure adequate stent expansion
  - Reduce MACE
  - Identify flush occluded ostium
  - Real time wire guidance
  - Verify intraluminal position
  - Determine stent coverage over subintimal course and lipid rich plaque