IVUS guided Approach During Wiring

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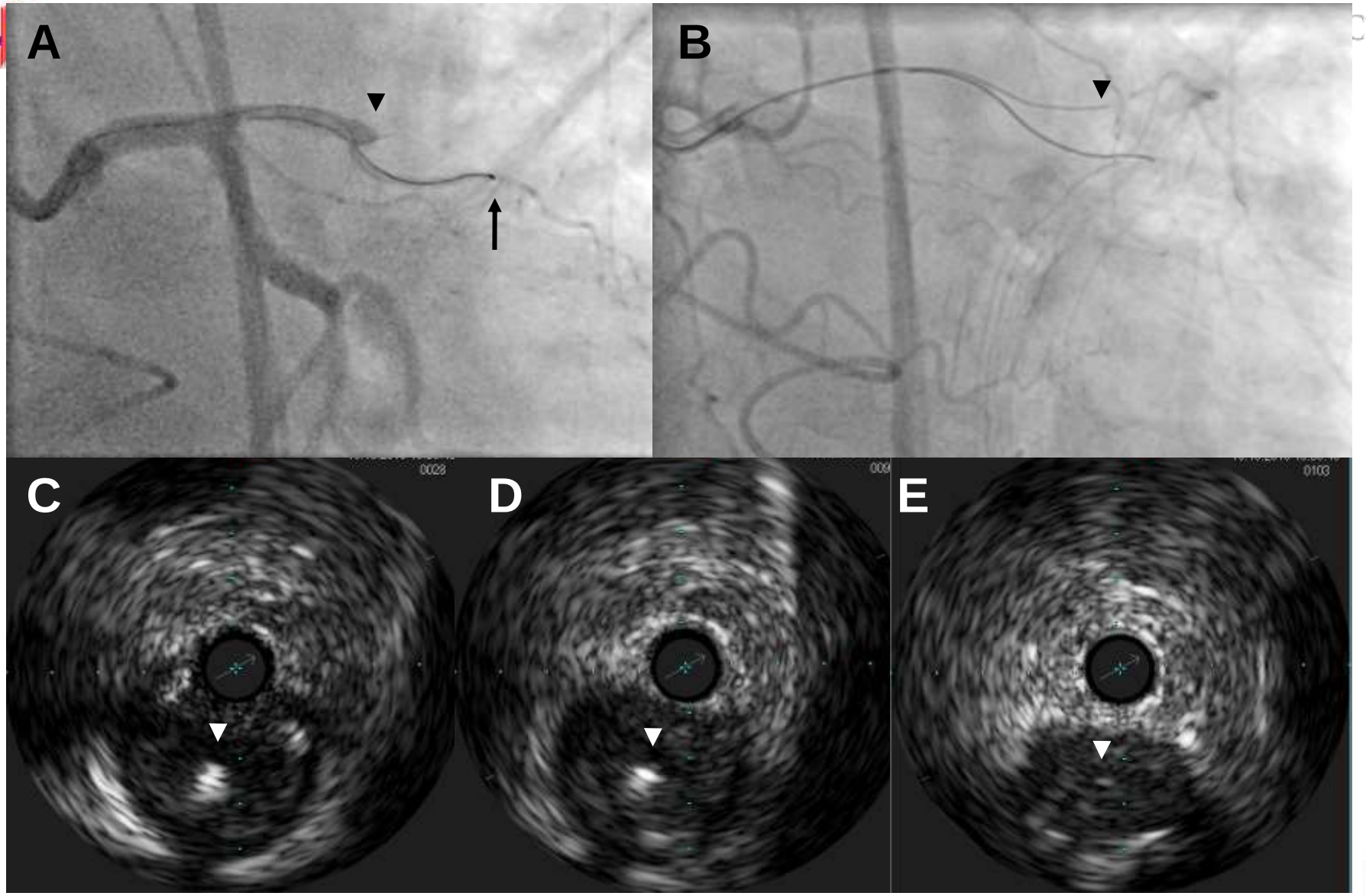
Conflict of interest

- I, Gerald S. Werner, MD, have no conflict of interest to declare with regard to the following presentation

IVUS in CTOs

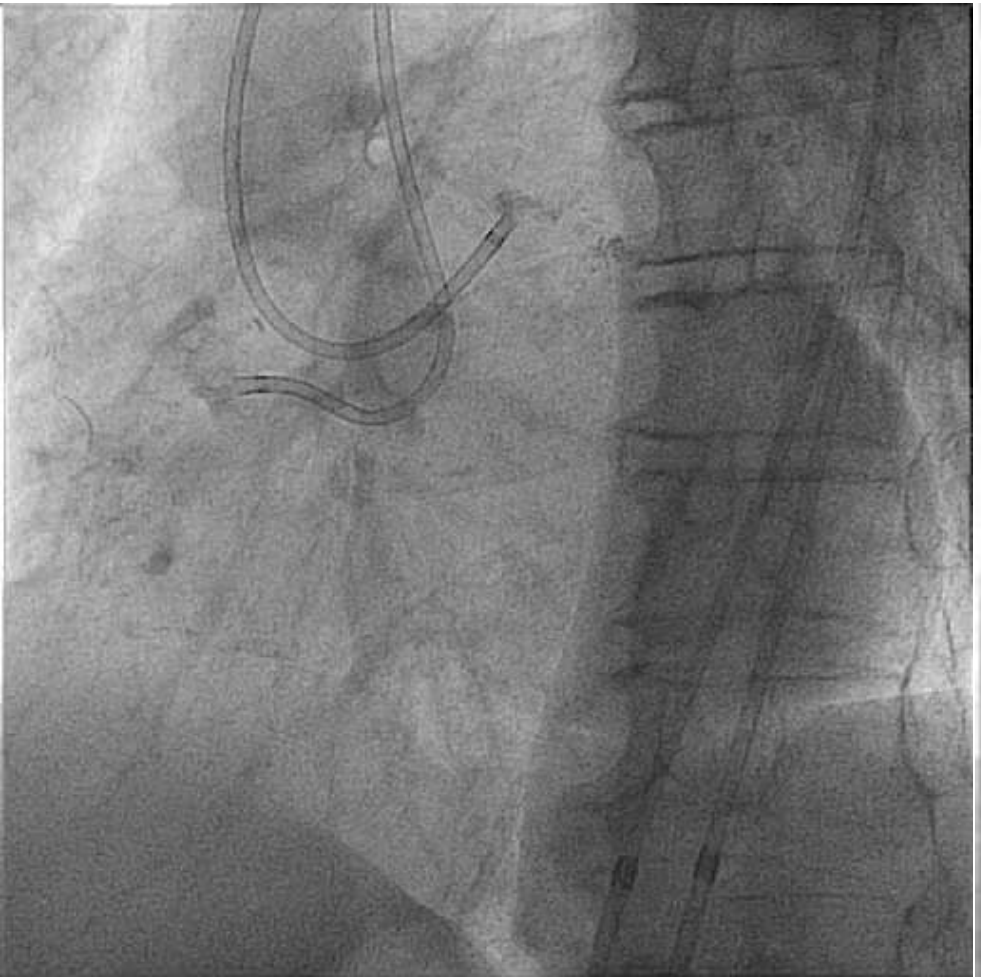
- IVUS in the antegrade approach
  - Identify the proximal cap
  - Verify true lumen entry
  - Try to guide reentry into true lumen
  - Verify true lumen position after reentry
- IVUS in the retrograde approach
  - Identify issues with hampered retrograde wire
  - IVUS guided reverse CART
  - **Mandatory when approaching left main**
- IVUS to optimize stenting in diffusely diseased CTOs
  - What is the true vessel size
  - How extensive should we cover the vessel by stents
  - Can we leave a bifurcation or should we treat it

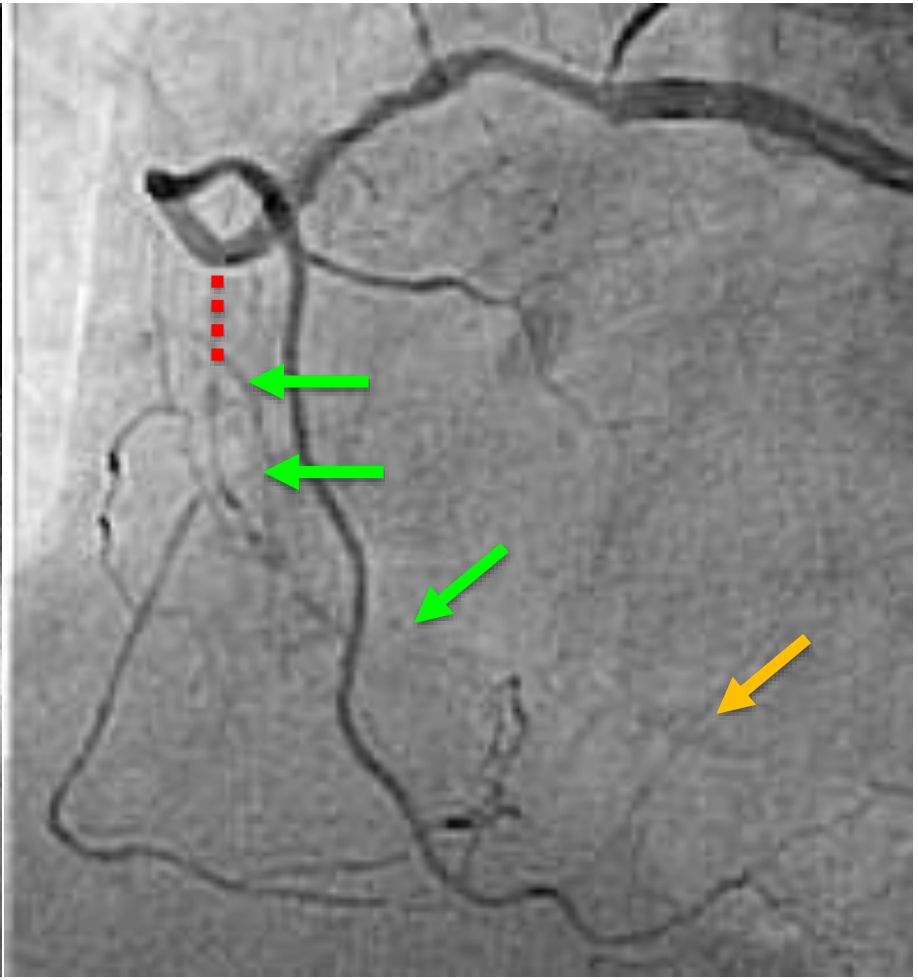
IV US guided cap penetration



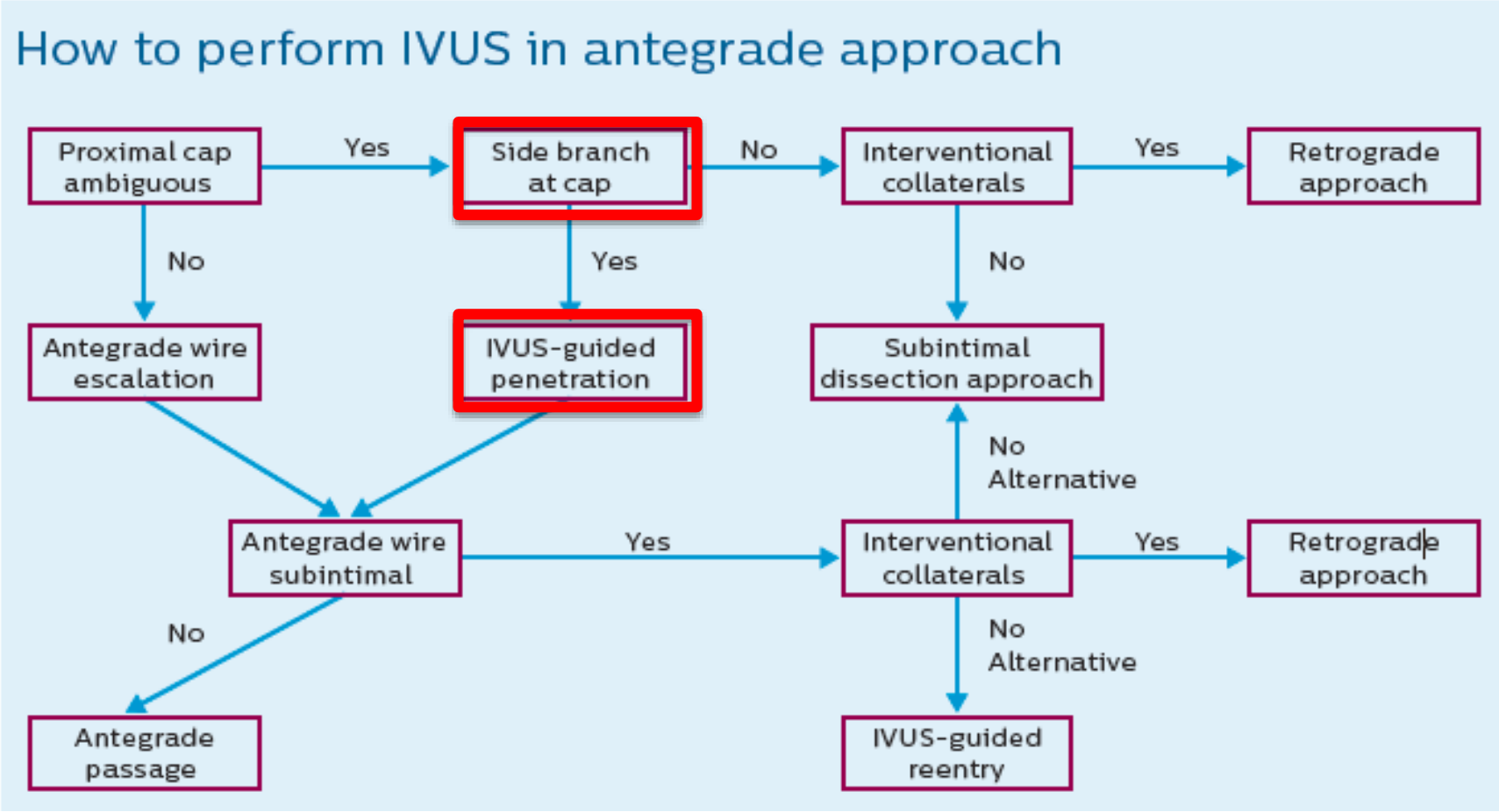
Werner GS in PCR-EAPCI Textbook on Interventional cardiology 2015

Pre procedural angiography

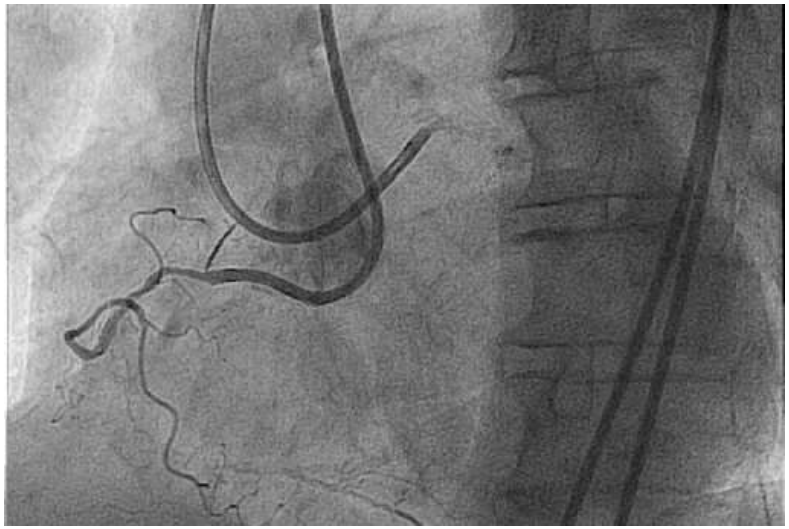


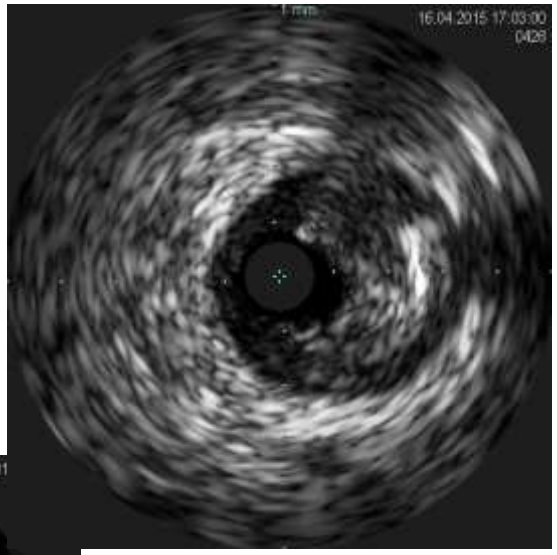


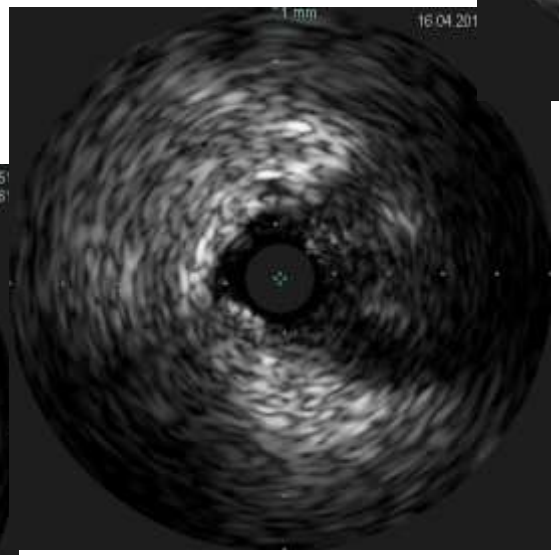
Practical use of IVUS in CTO interventions: IVUS in antegrade approach

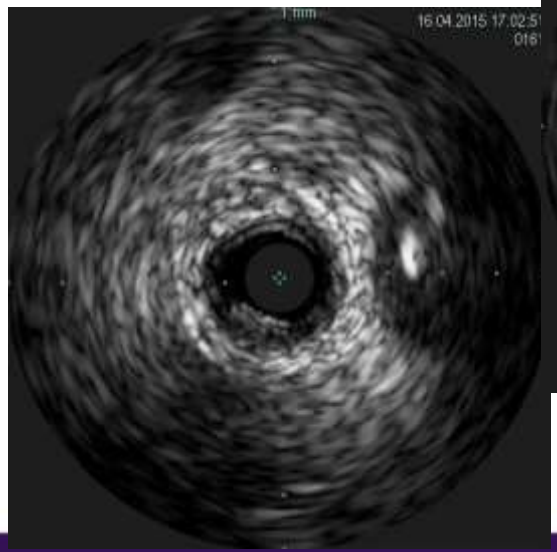


Procedural preparation: Identify the proximal cap ?







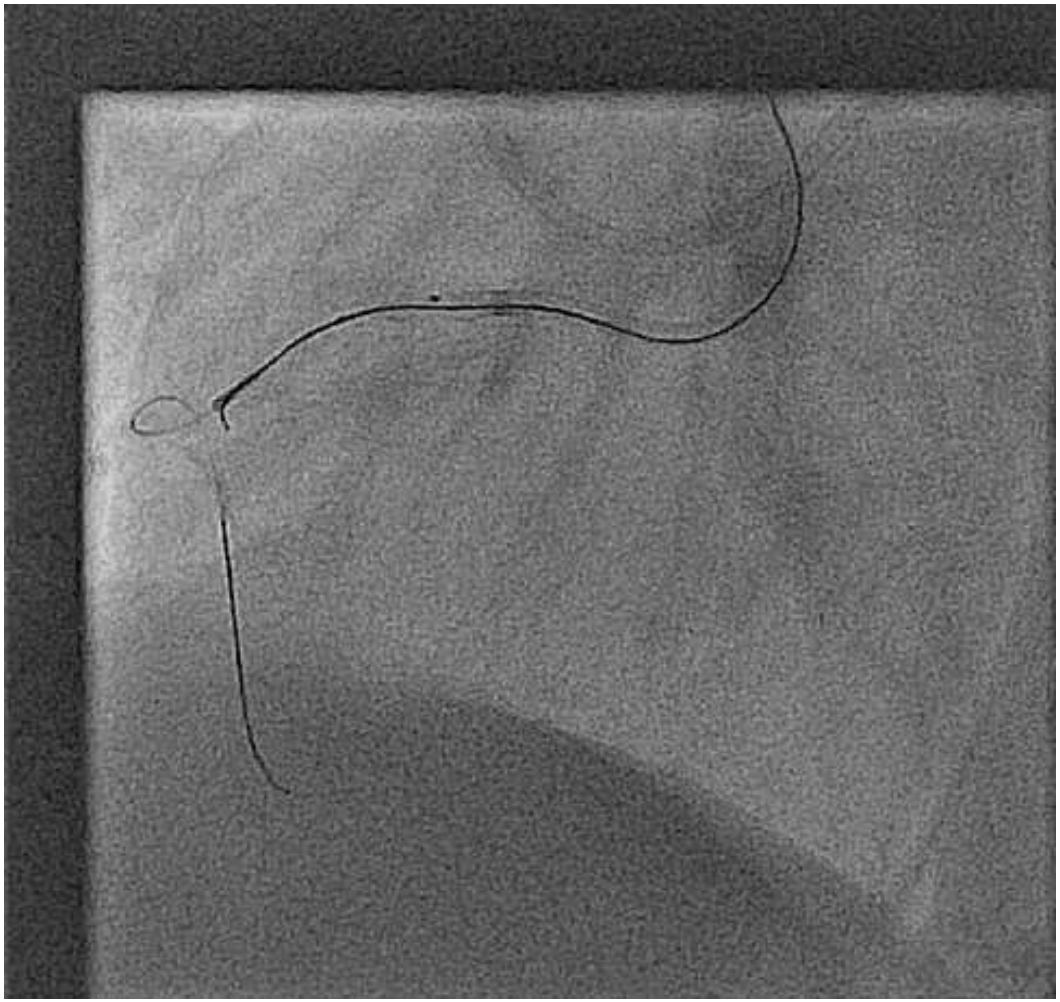


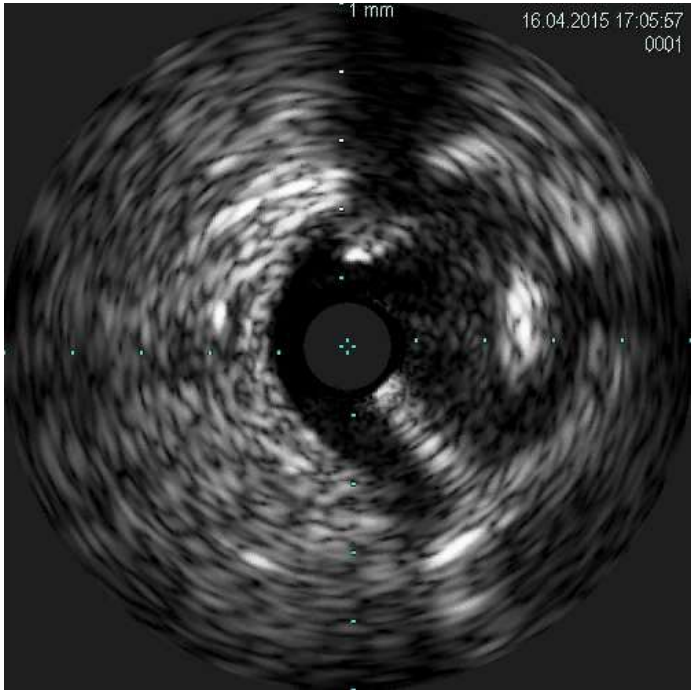
Probe in proximal RCA with diffuse atherosclerosis

Probe in side branch

Probe at takeoff of the side branch

Procedure: Puncture of the cap with Gaia 2

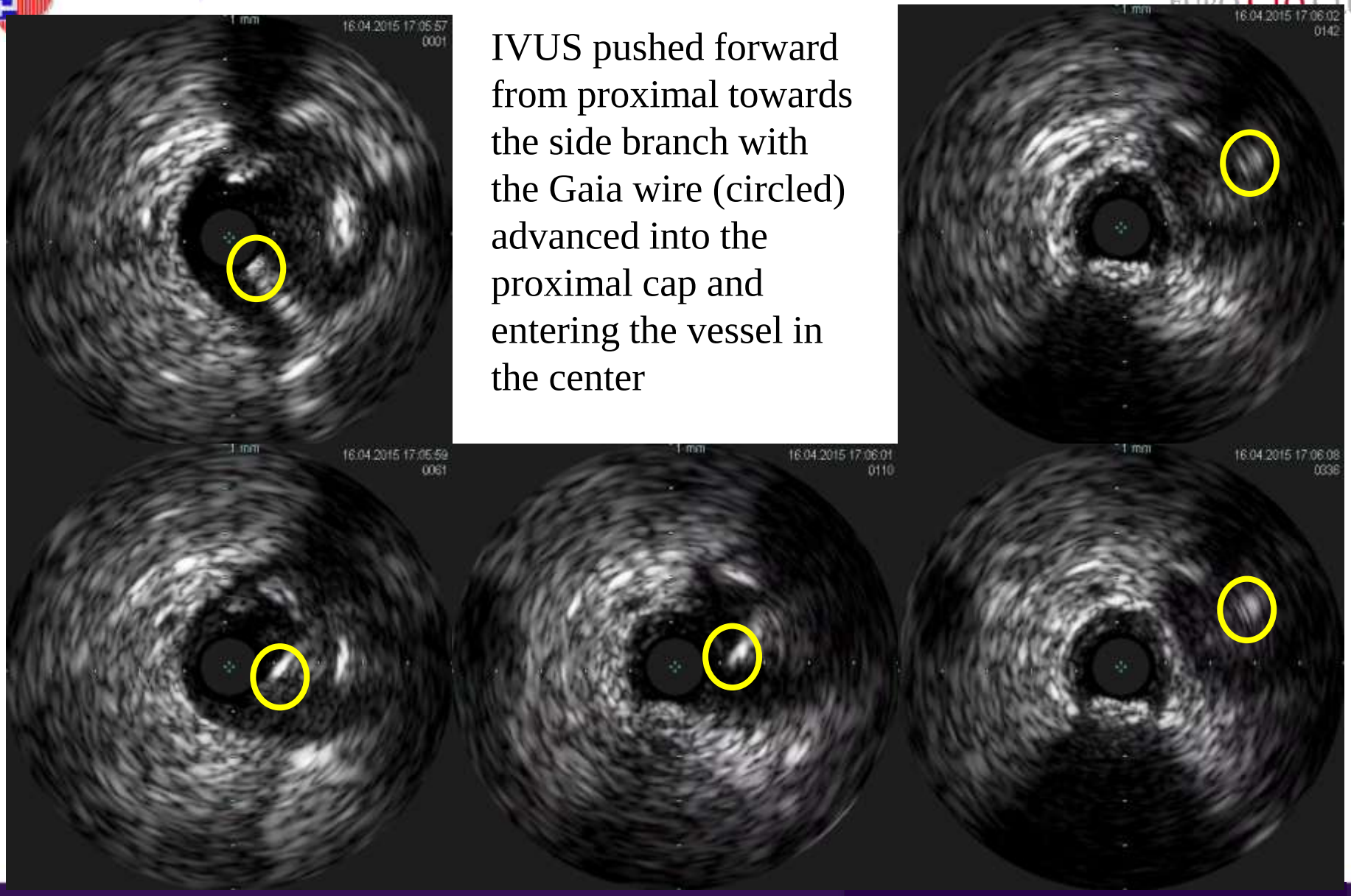




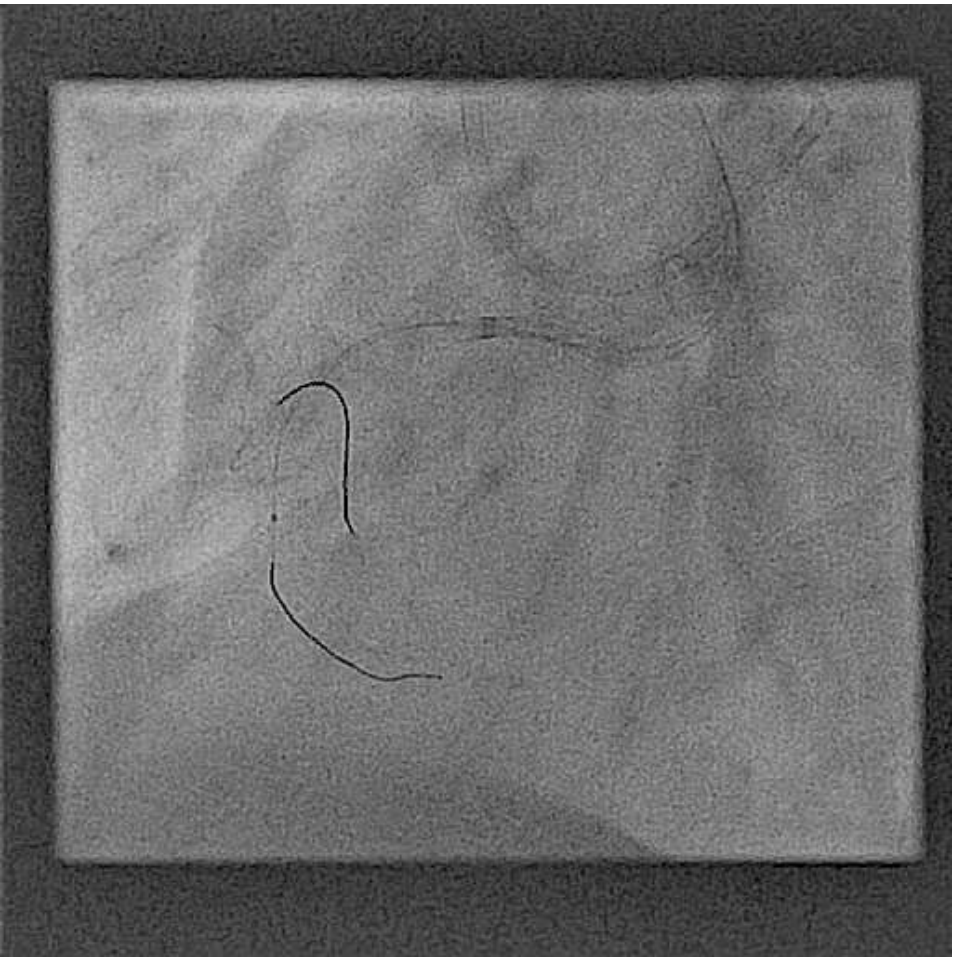
IVUS in place, next to IVUS Finecross microcatheter and Gaia 2 wire with distal extra bend

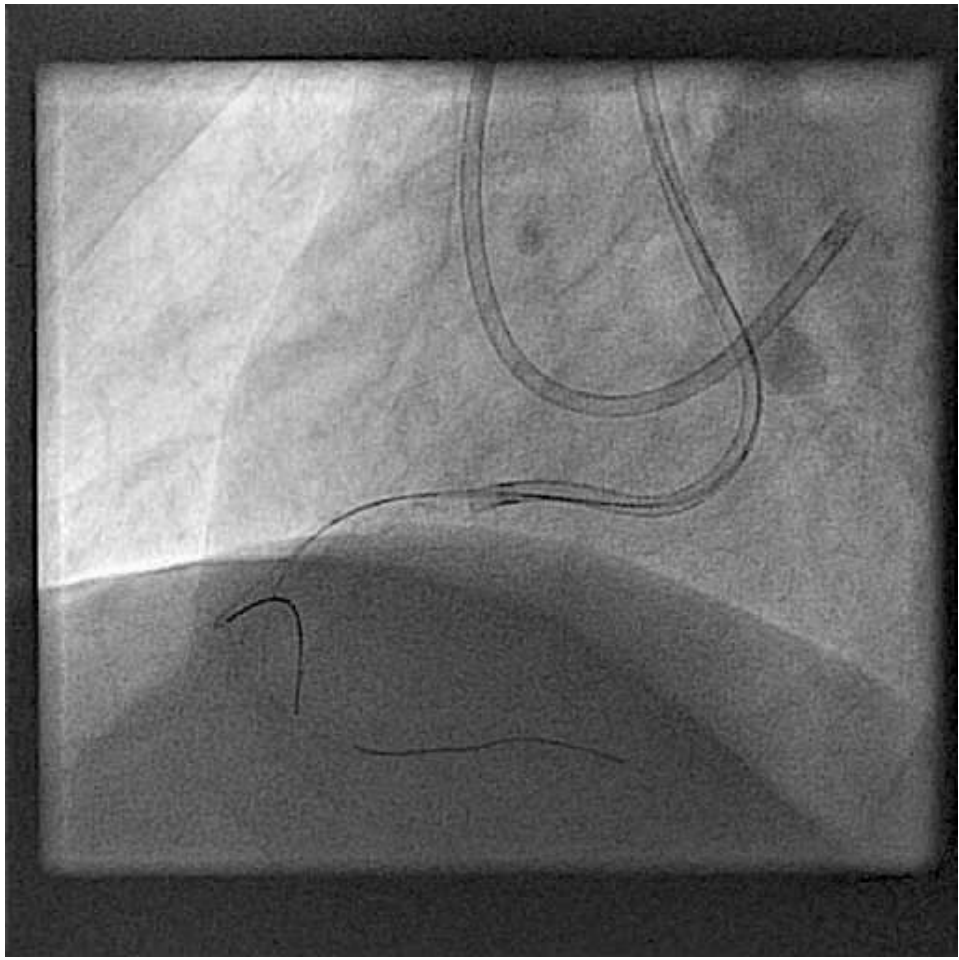
Identifying the puncture point

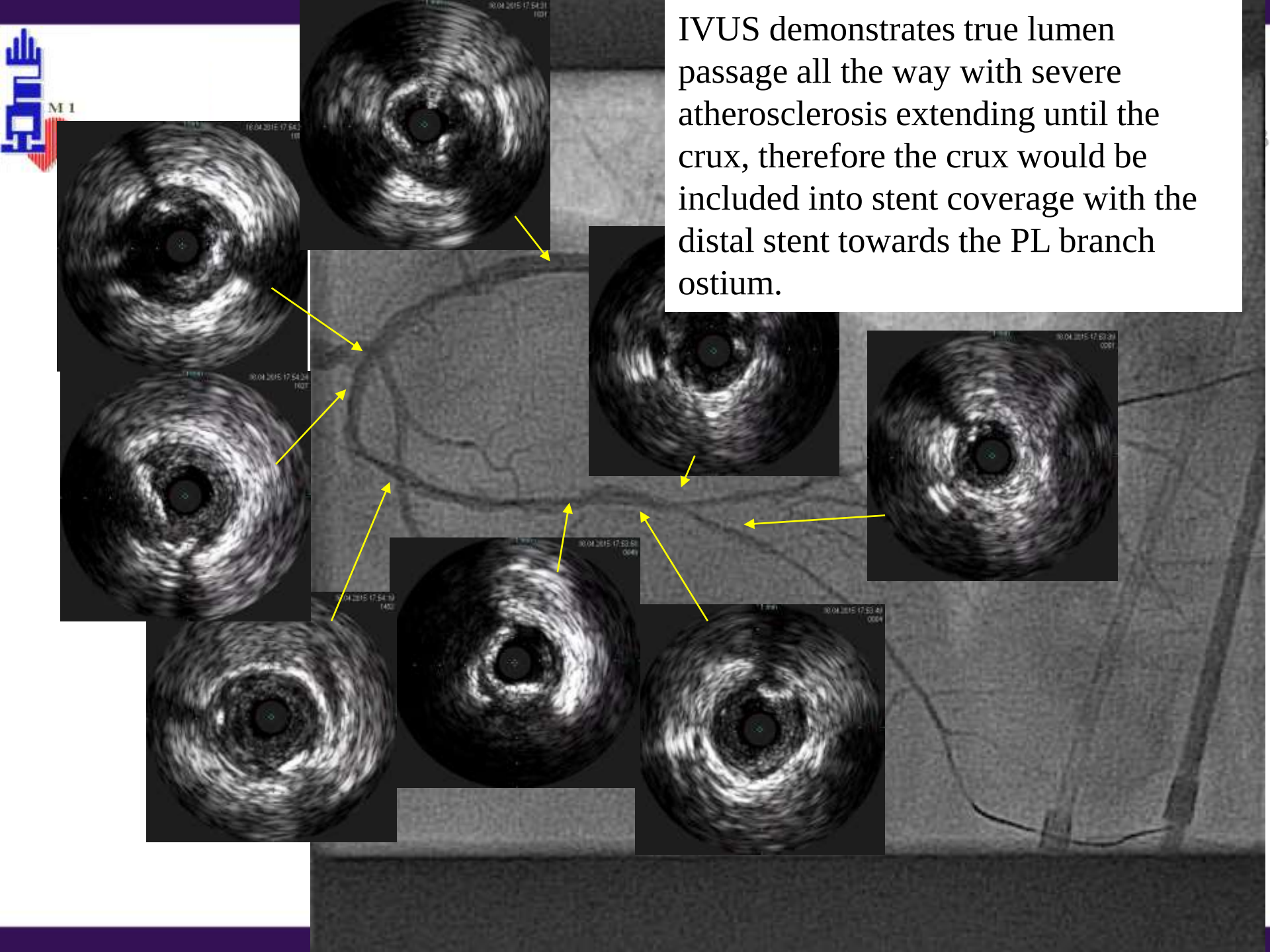
IVUS pushed forward from proximal towards the side branch with the Gaia wire (circled) advanced into the proximal cap and entering the vessel in the center



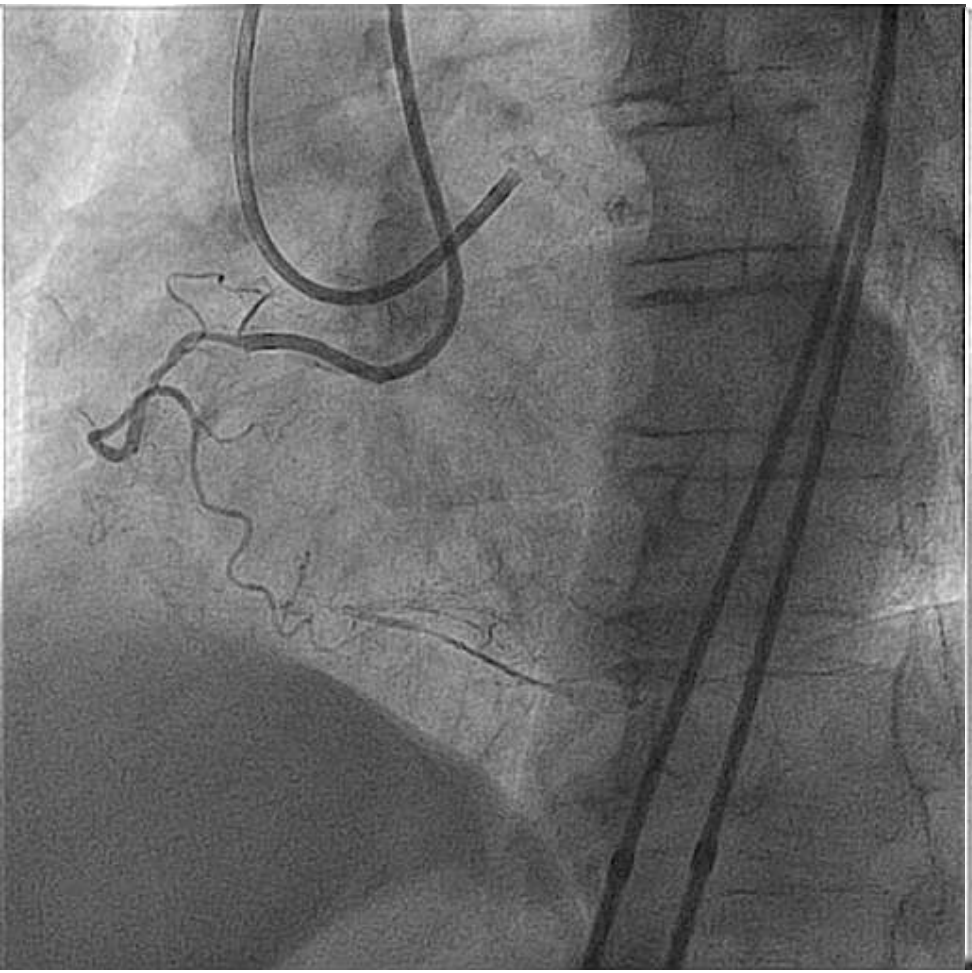
Step down: XTR, then Sion Black

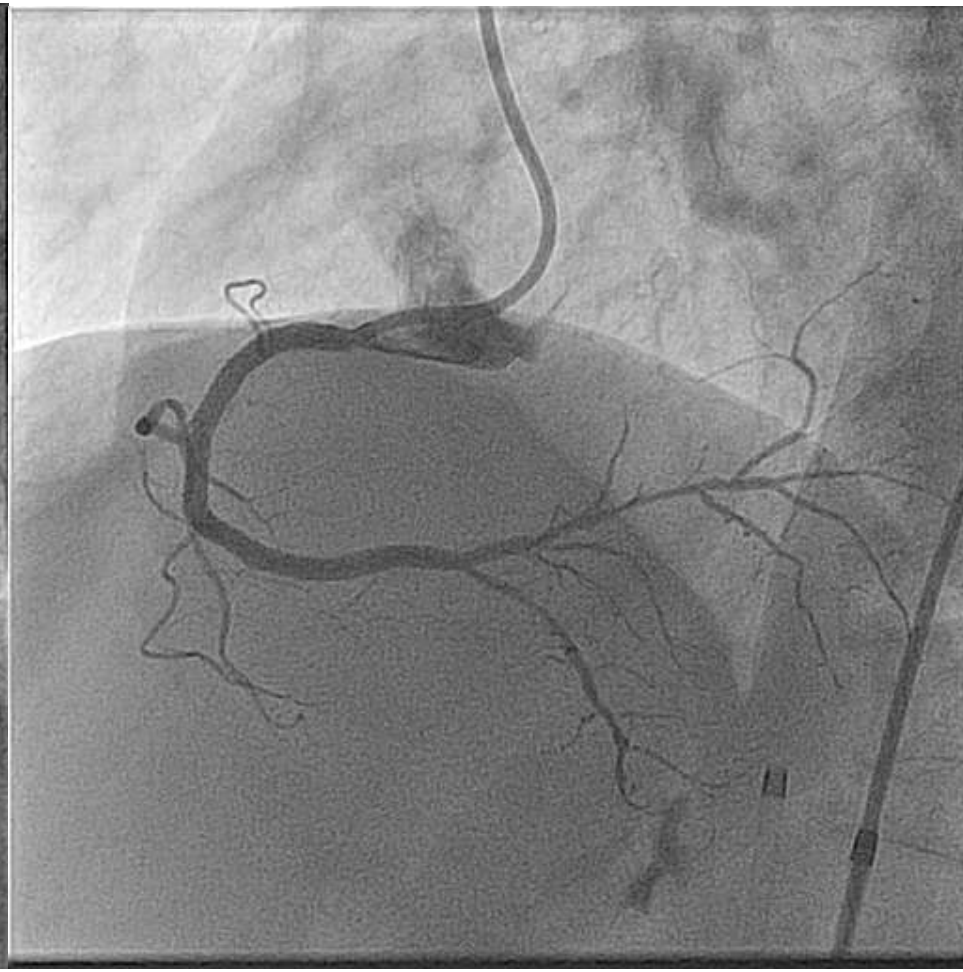




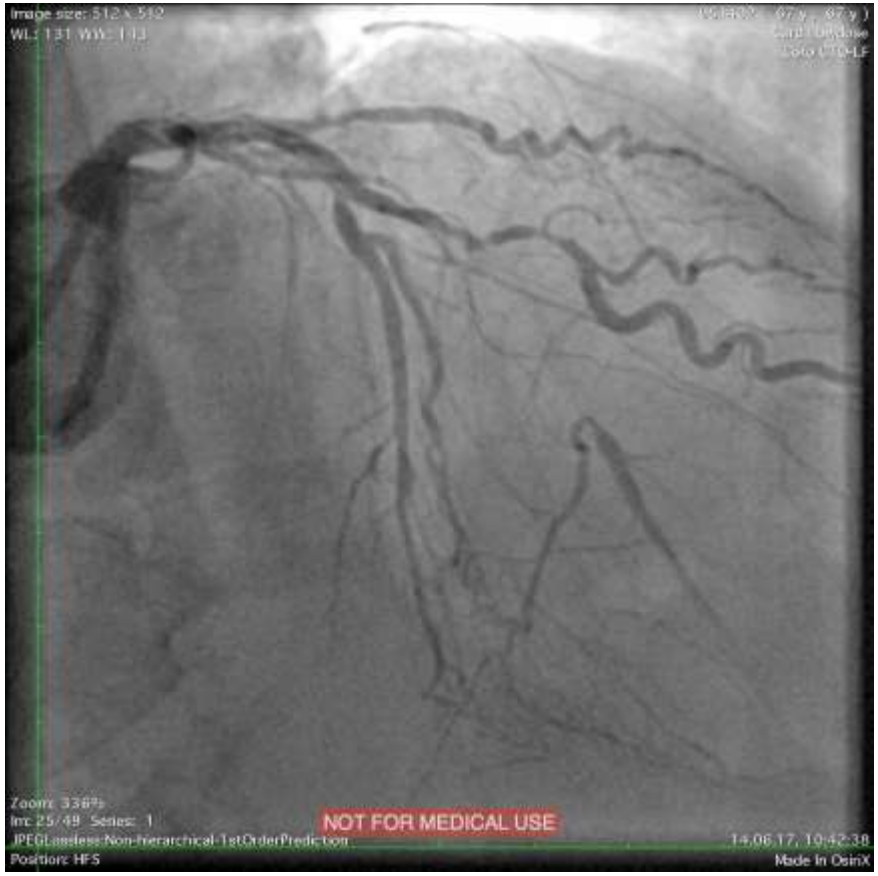

IVUS demonstrates true lumen passage all the way with severe atherosclerosis extending until the crux, therefore the crux would be included into stent coverage with the distal stent towards the PL branch ostium.

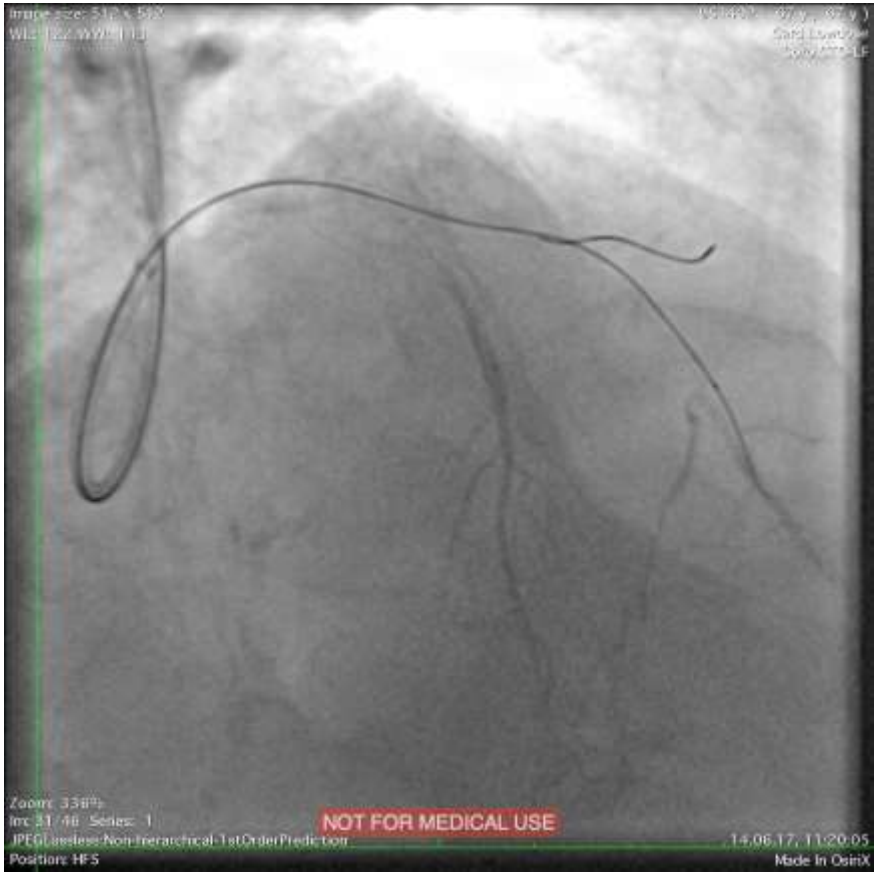
Complex long RCA CTO





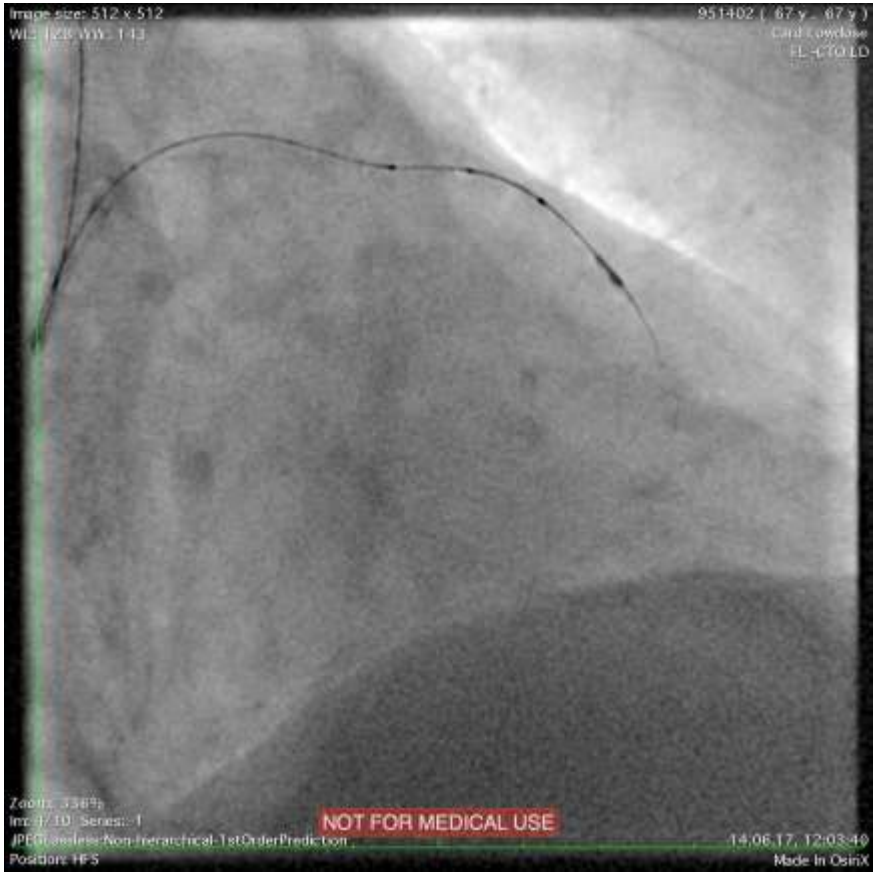
LAD CTO

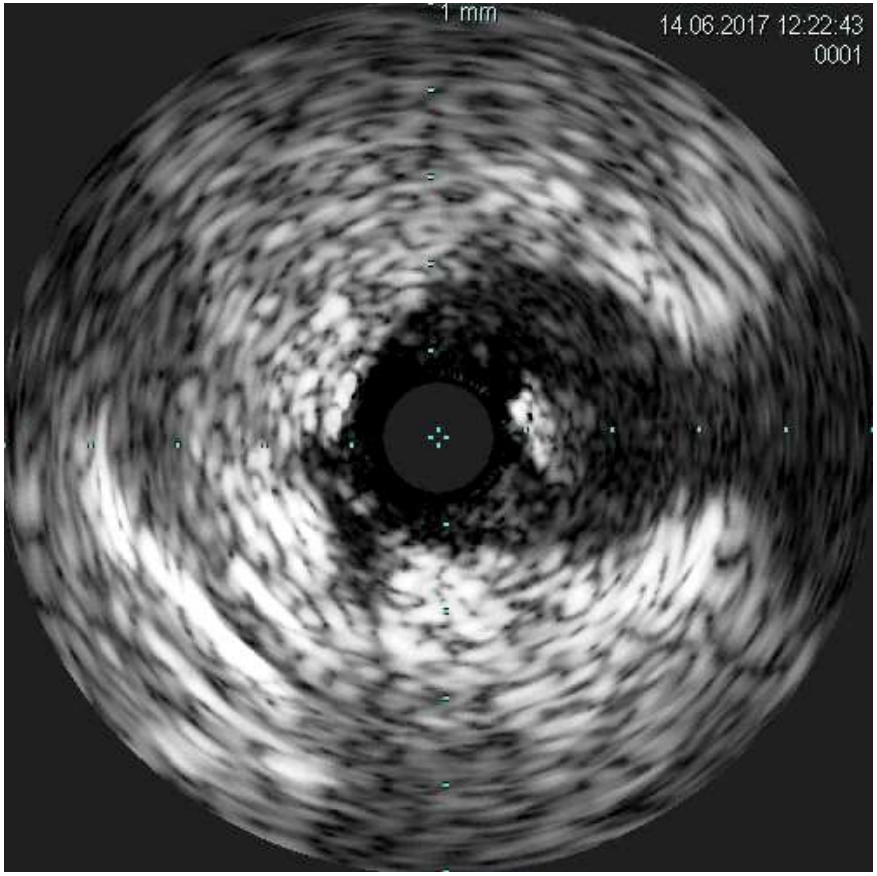




Subintimal wire position, documented via selective injection into the septal branch: retrograde passage not possible, StingRay catheter unsuccessful

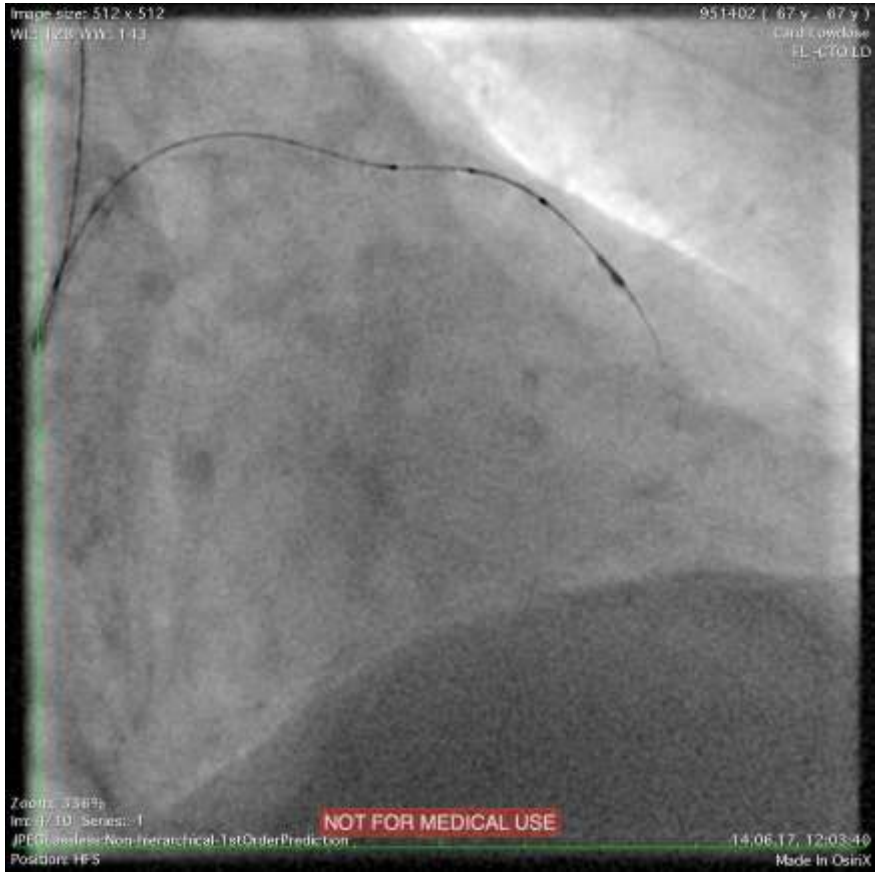
LAD CTO: IVUS analysis of subintimal position

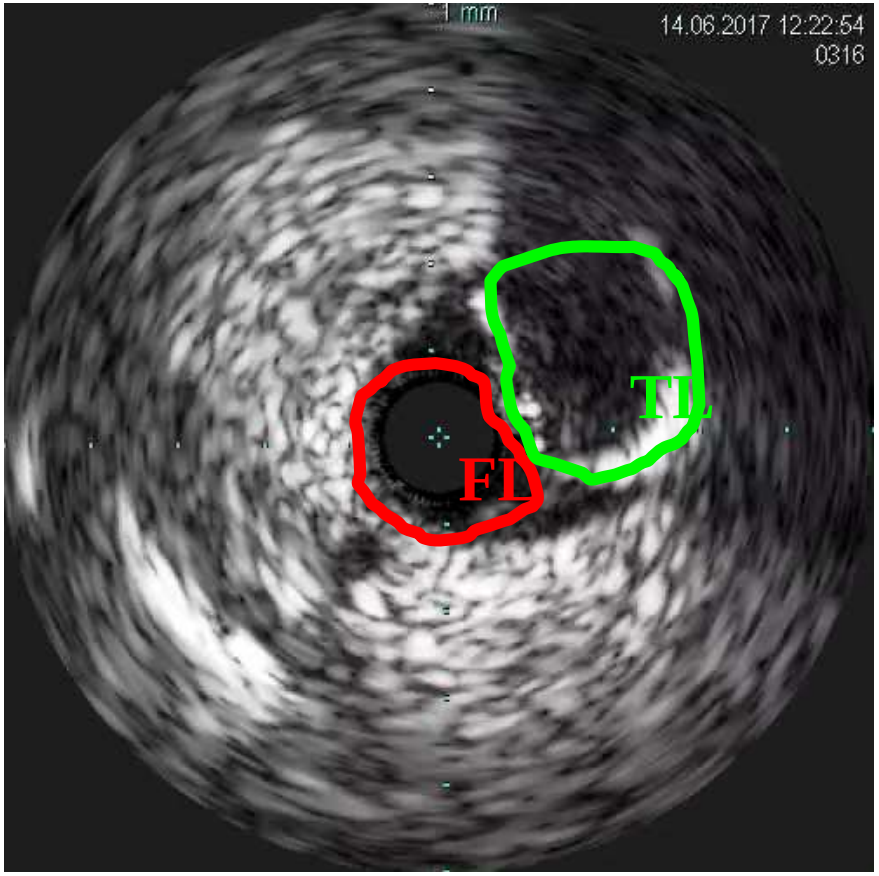




Subintimal wire position, documented by IVUS

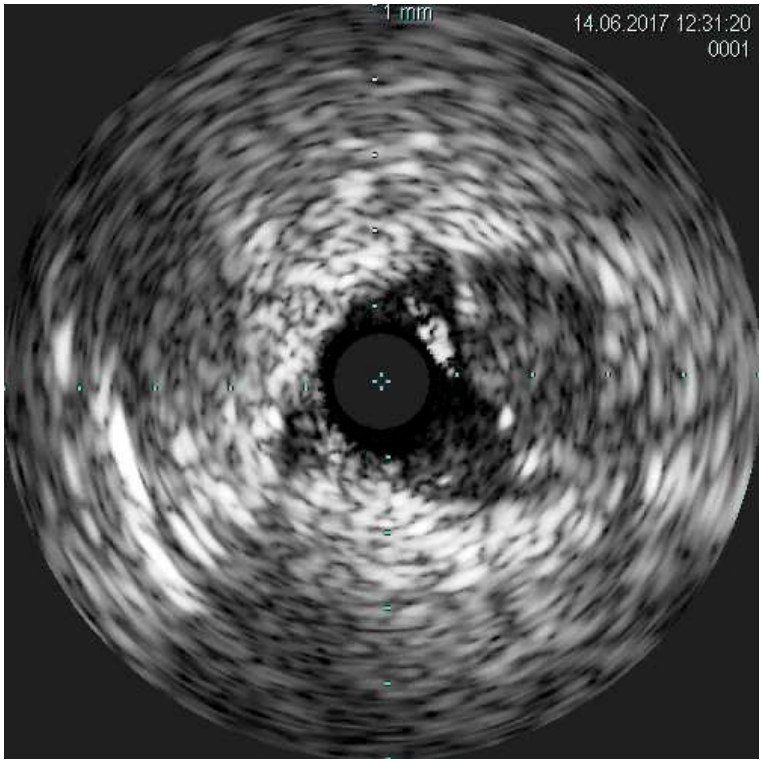
LAD CTO: IVUS analysis of subintimal position

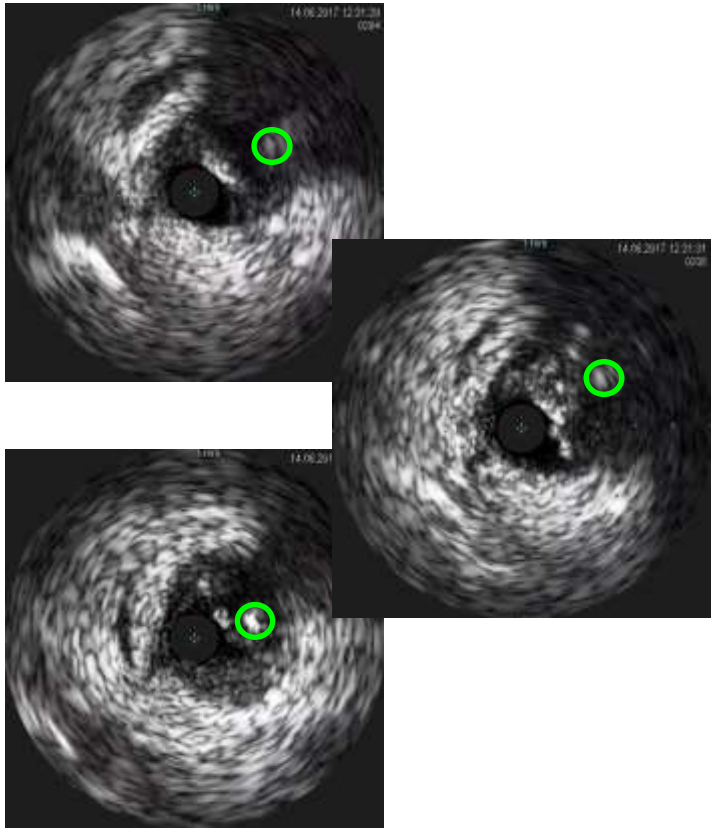




Subintimal wire position, documented by IVUS

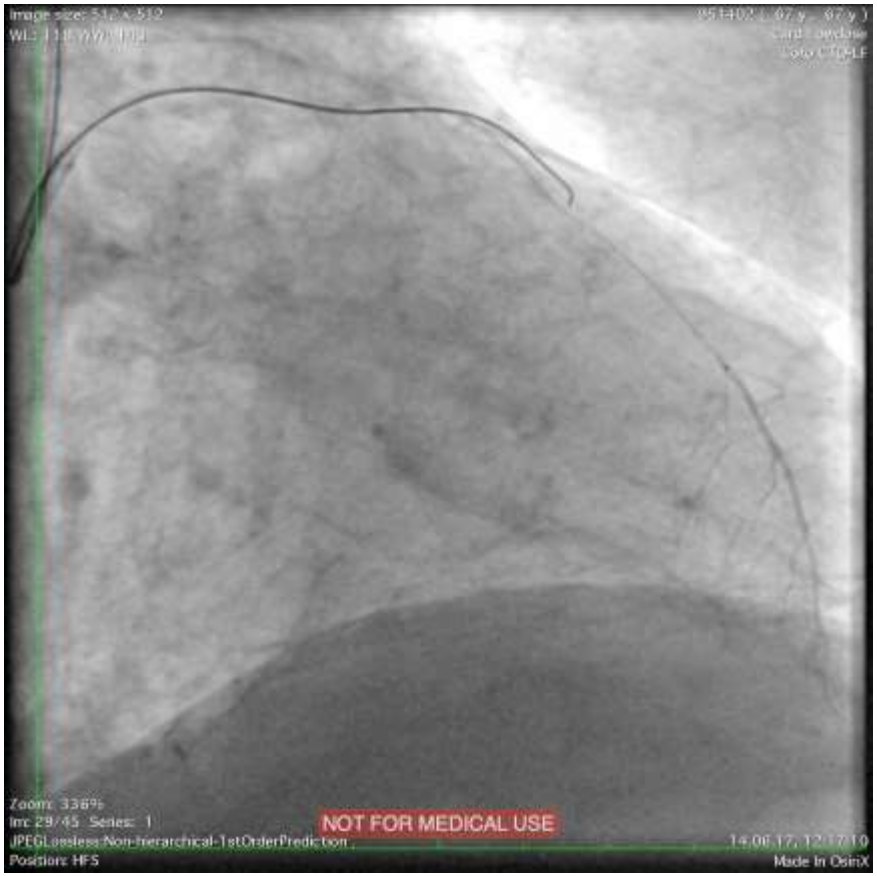
LAD CTO: IVUS analysis of reentry of wire

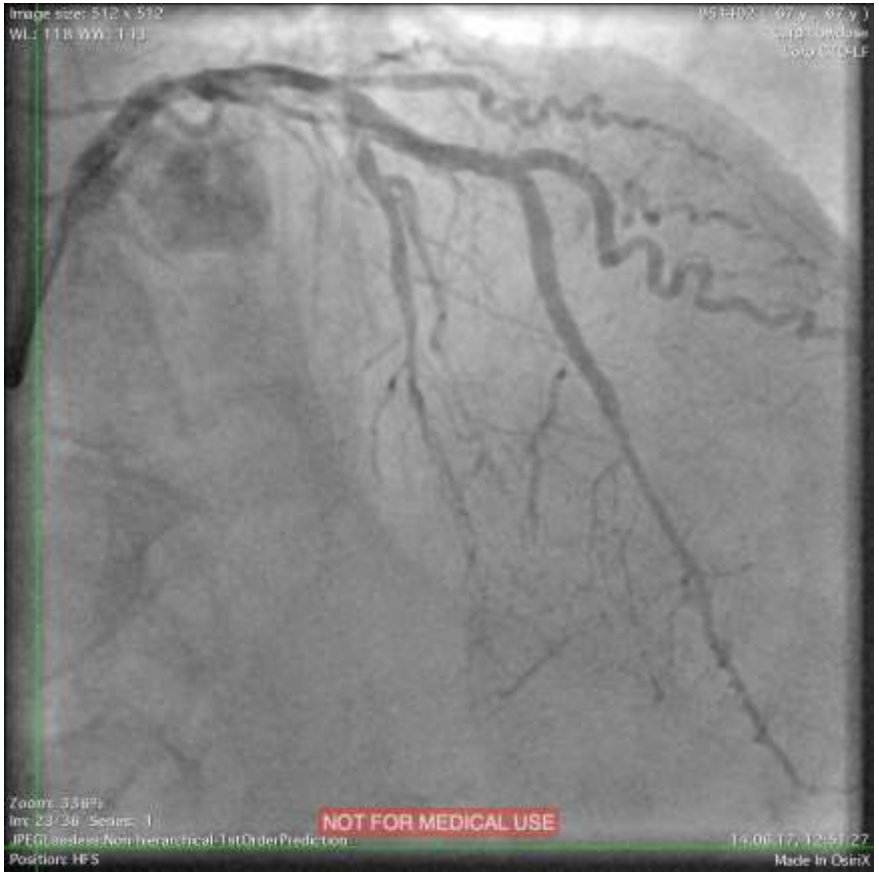




Repuncture of the proximal cap under IVUS control via a microcatheter with Confianza Pro 12

LAD CTO: IVUS analysis of subintimal position





Exchange of the stiff wire for a soft wire, and then safe advancement into distal LAD, then stent placement and bifurcation two-stent strategy

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JACC Journals

From: Fundamental Wire Technique and Current Standard Strategy of Percutaneous Intervention for Chronic Total Occlusion With Histopathological Insights

J Am Coll Cardiol Intv. 2011;4(9):941-951. doi:10.1016/j.jcin.2011.06.011

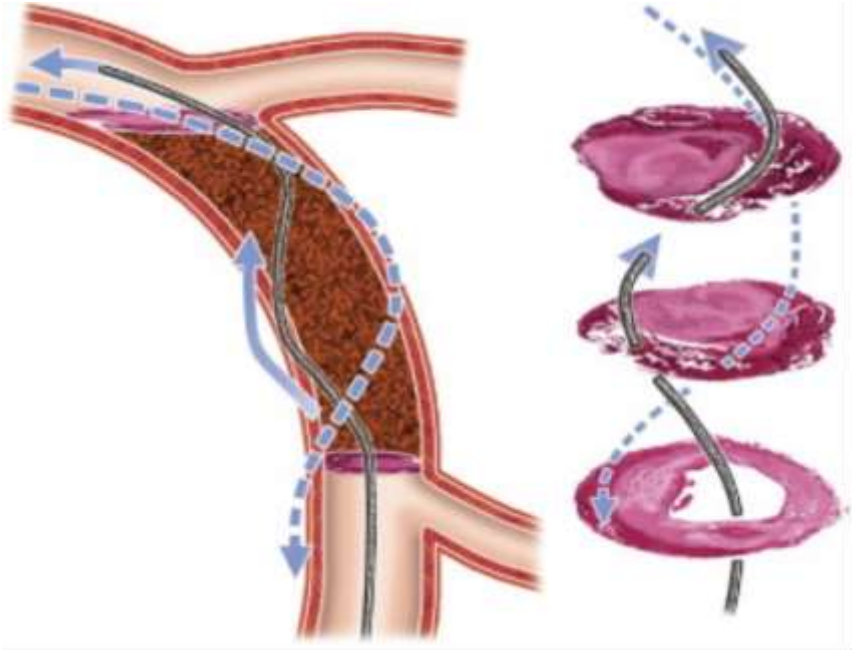
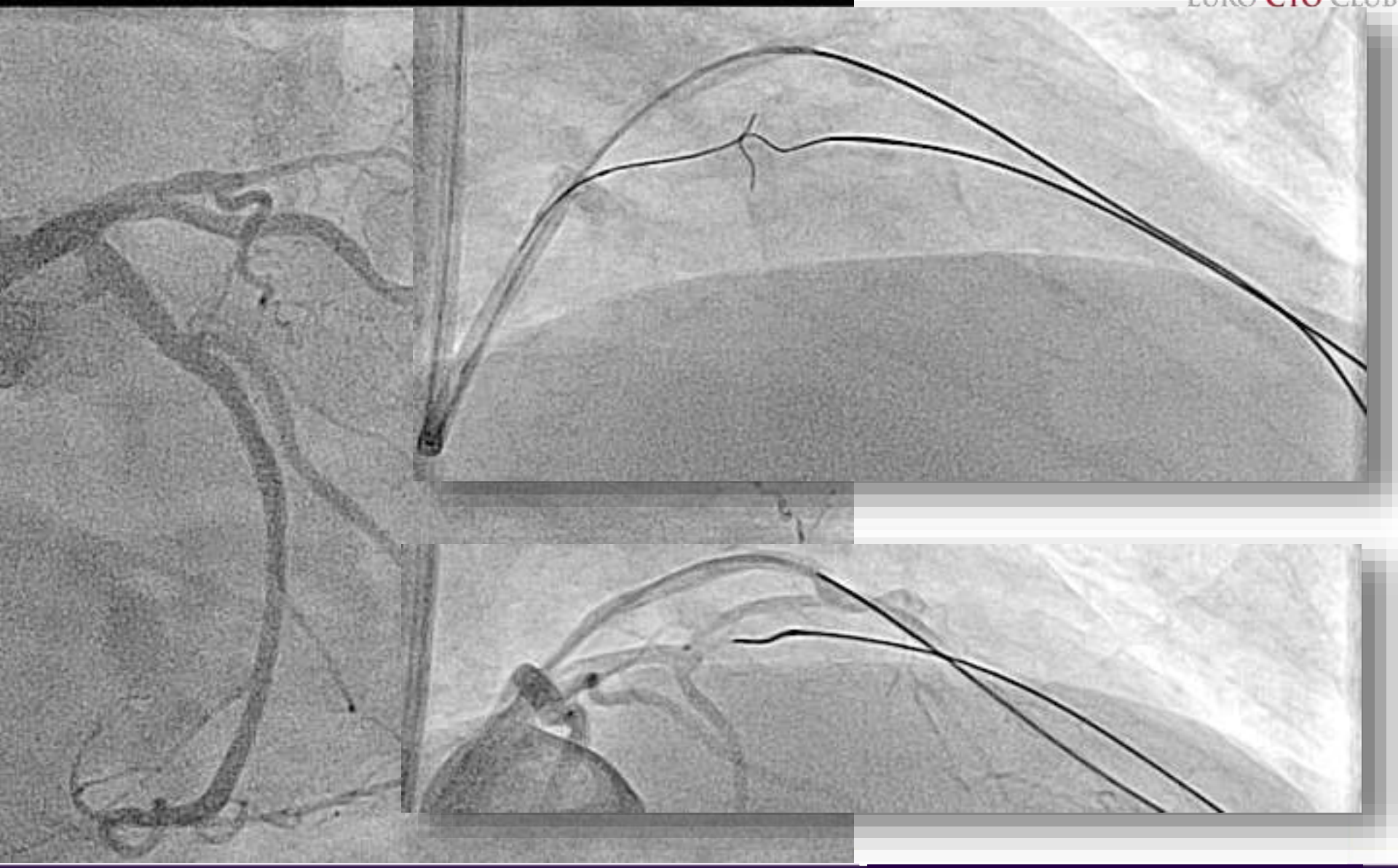


Figure Legend:

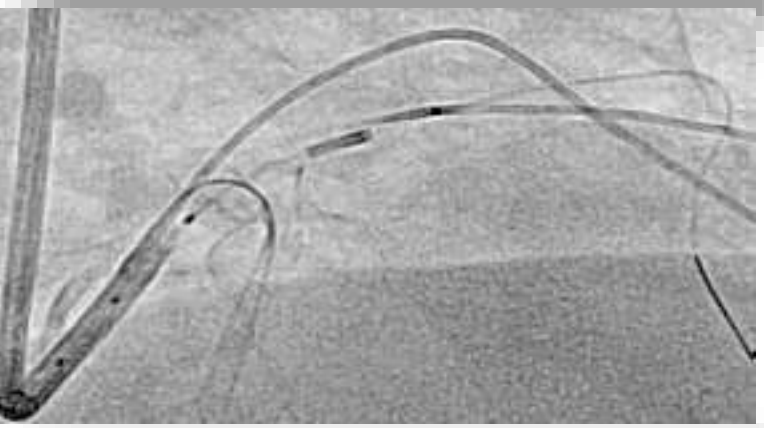
Principle of Retrograde Subintimal Tracking

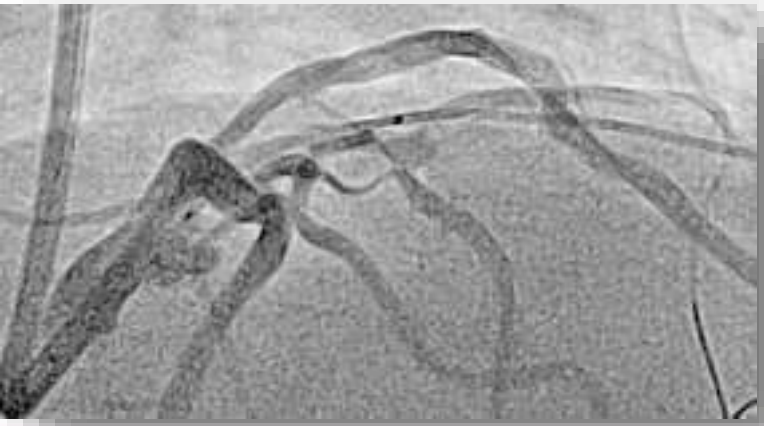
Antegrade subintimal tracking (dotted line) and retrograde subintimal tracking (solid line). Even though the angiogram shows that the 2 wires are separated (antegrade and retrograde), both wires can be positioned in the same subintimal space. After the retrograde wire comes into the same lumen with the antegrade wire, crossing into the proximal true lumen with the retrograde wire is highly promising.

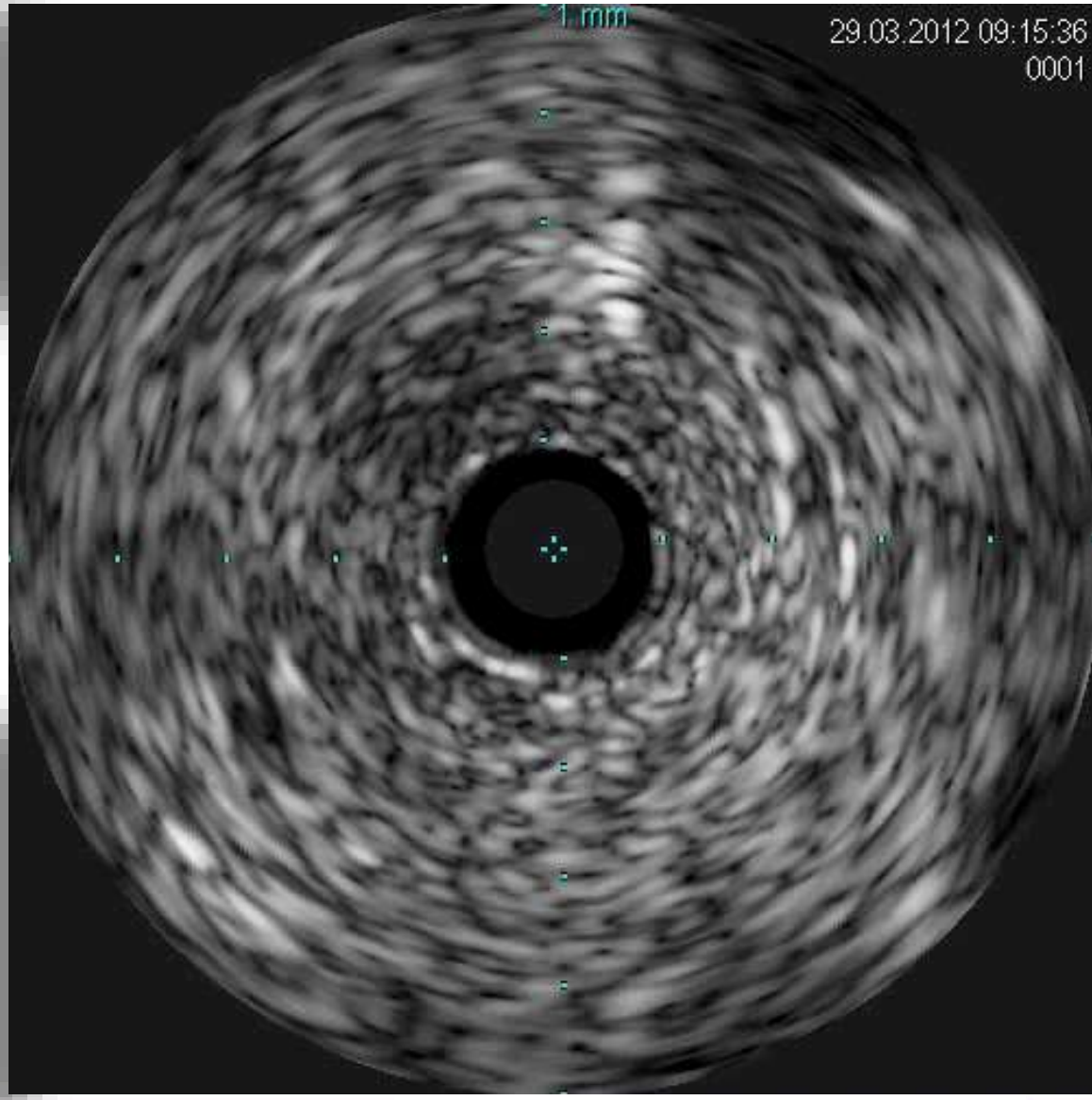
LAD occlusion without stump at diagonal take-off



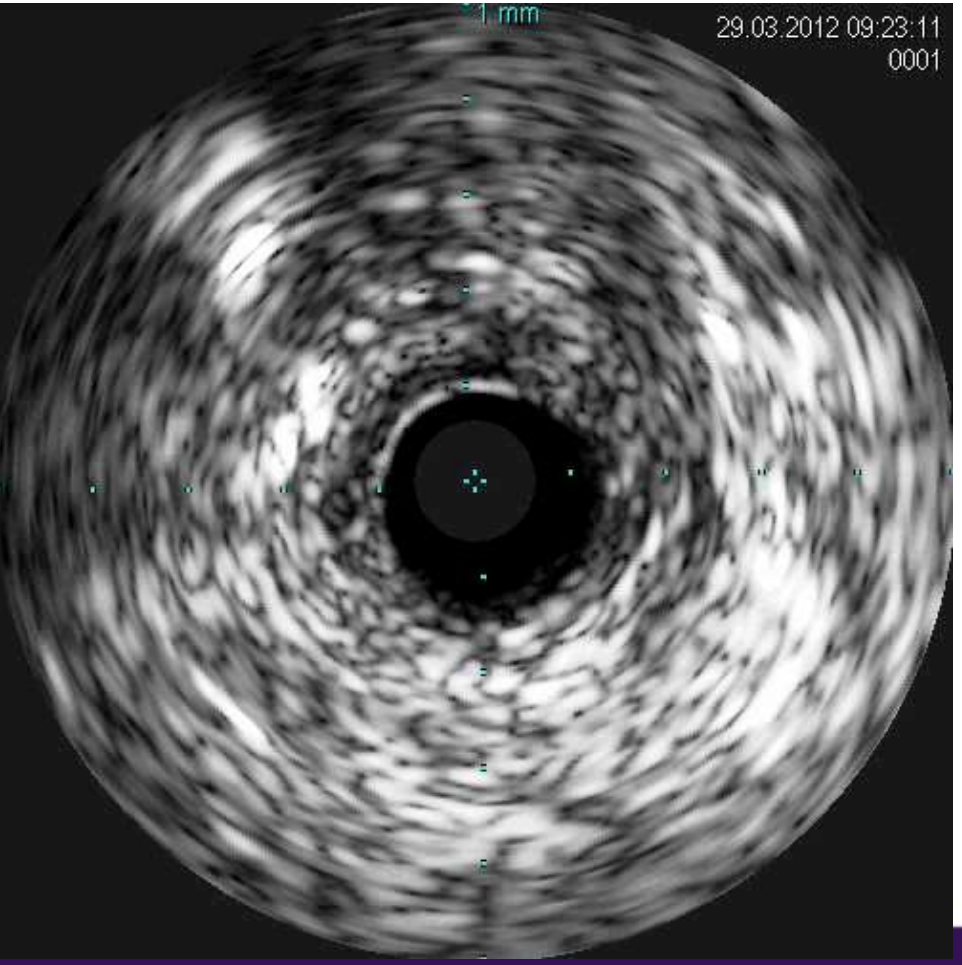
IVUS in retrograde approach towards left main

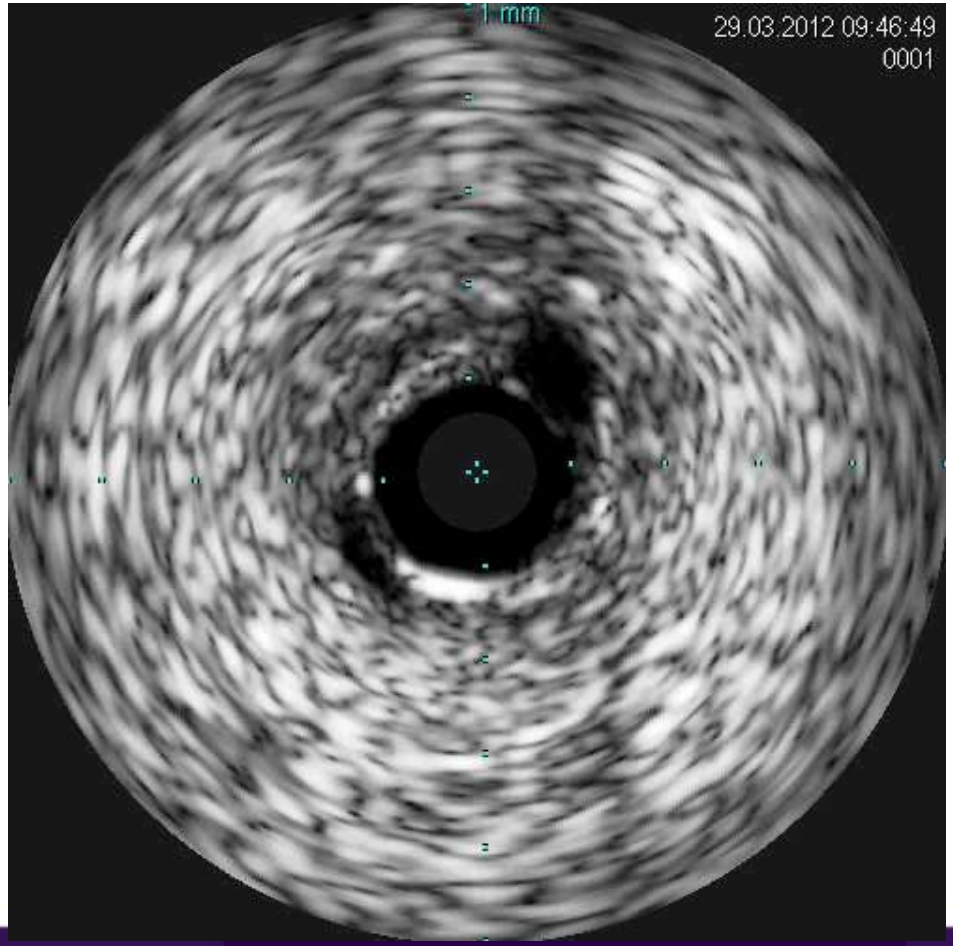






Subintimal retrograde passage under IVUS corrected to true lumen passage





Take Home Message

- IVUS is an indispensable tool for CTO PCI
- It is not required in every procedure, but it may improve the long-term outcome by optimised stenting
- During the procedure, there are many typical situations where IVUS helps to decide the strategy and guides the successful wireing

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