

OCT is Better than IVUS

especially for bifurcation PCI

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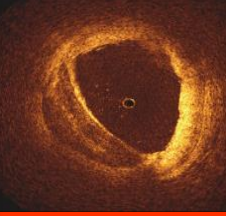
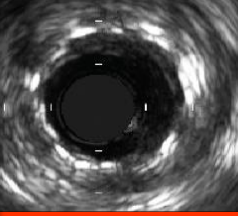


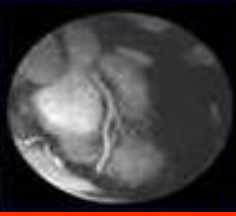

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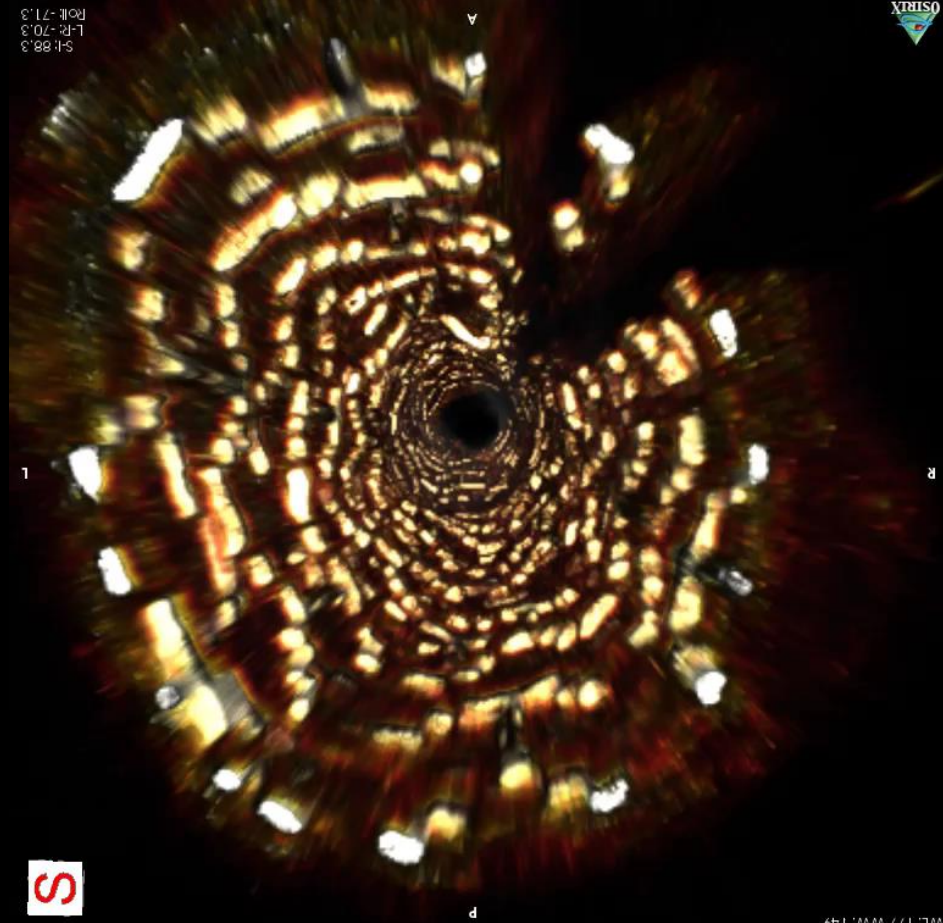
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Invasive/ Non-invasive imaging in cathlab

| | OFDI/ OCT | IVUS | CAG | MSCT | MRI | Angioscopy |
|----------------------------|---|---|--|---|---|---|
| |  |  |  |  |  |  |
| Resolution (µm) | 10-20 | 80-150 | 200 | 300 | 300 | 200 |
| Time aspect I | Real-time | Real-time | Real-time | | | Real-time |
| Time aspect II | 2-50 sec | 20-50 sec | | | | 30 sec |
| Type of scan source | IR-light | Ultrasound | X-rays | X-rays | Magnetic rays | Visible light |
| Imaging target | Layer | Layer | Bloodflow | Density | Density | Surface |
| Pullback Speed | 10-40 mm/sec | 0.5-1.0 mm/sec 10mm/s | | | | |

3-dimensional reconstruction: IVUS vs. OCT



Joint consensus on the use of OCT in coronary bifurcation lesions by the European and Japanese bifurcation clubs

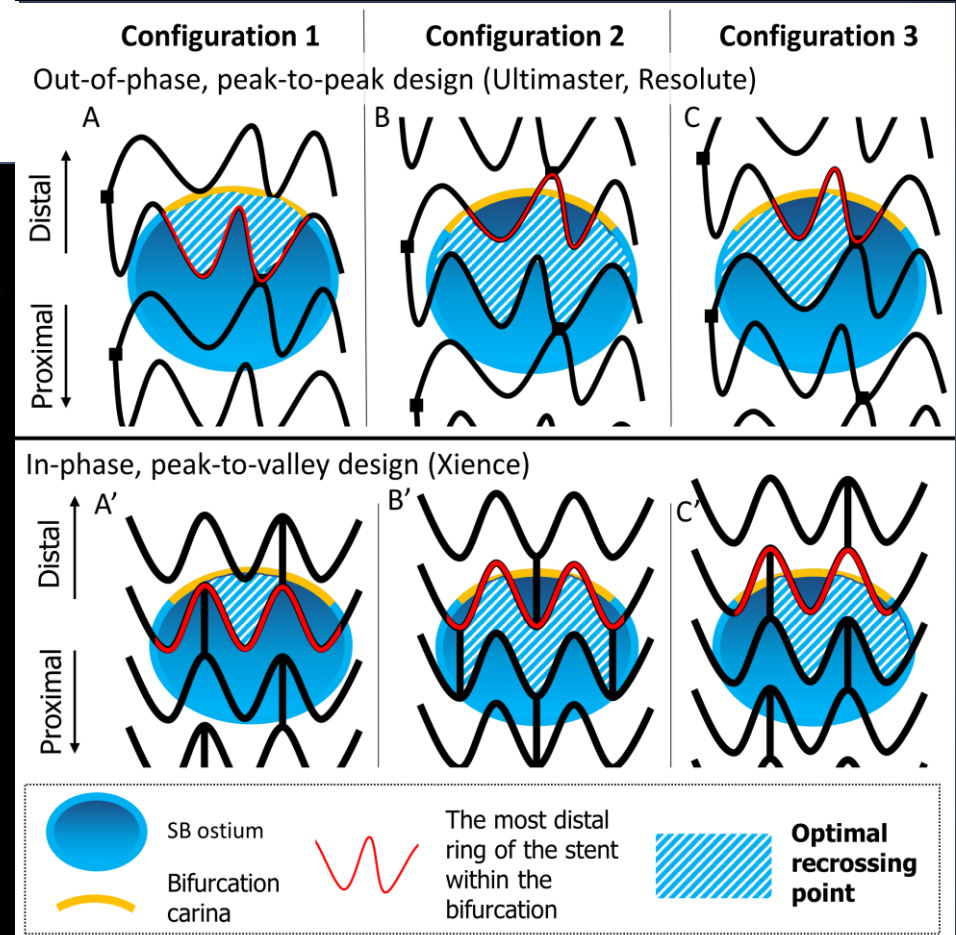
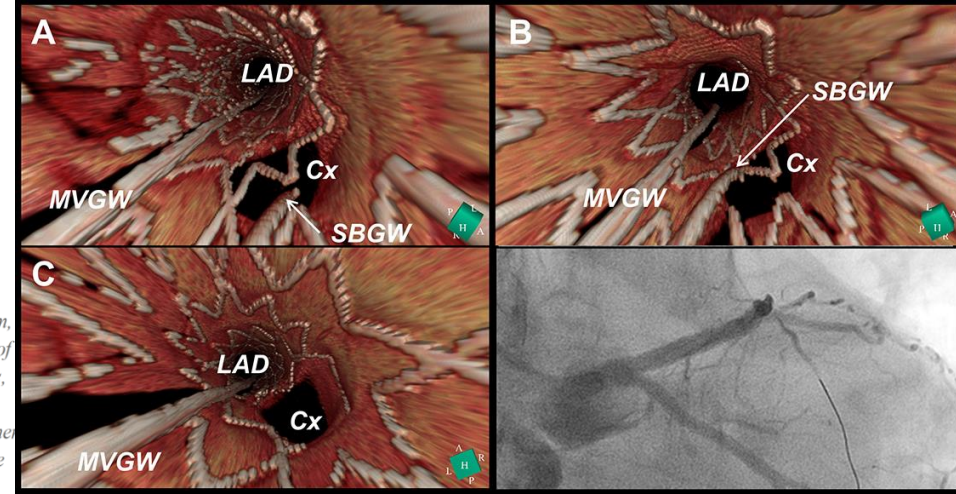
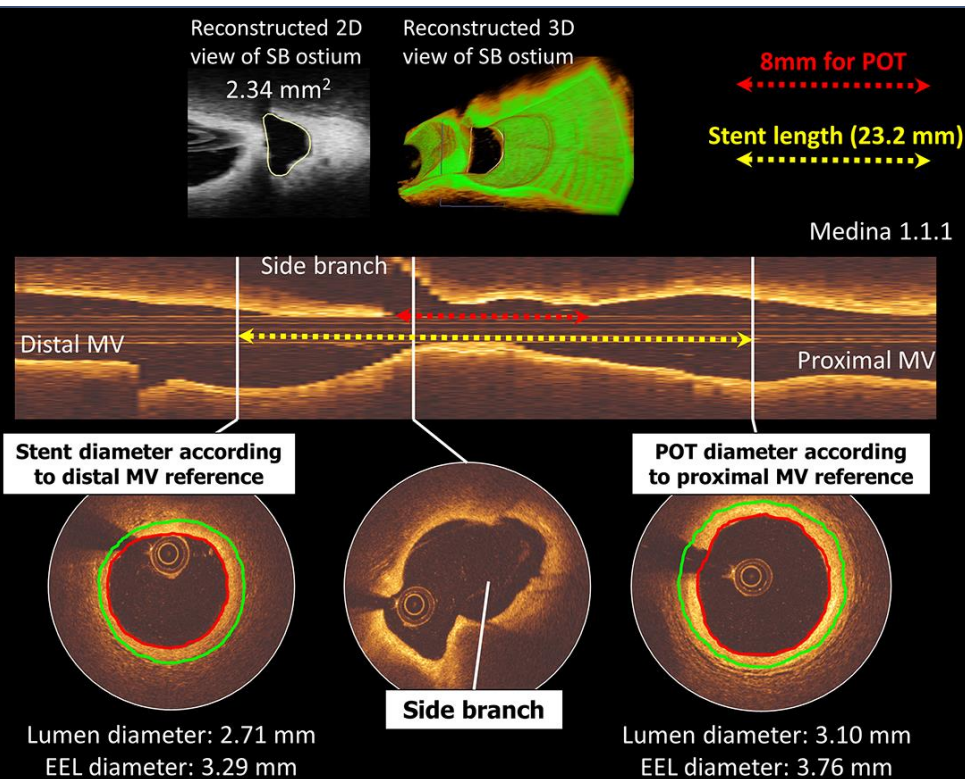


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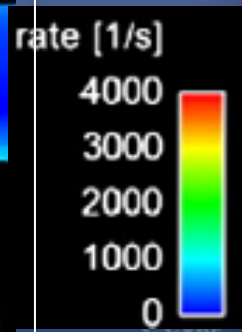
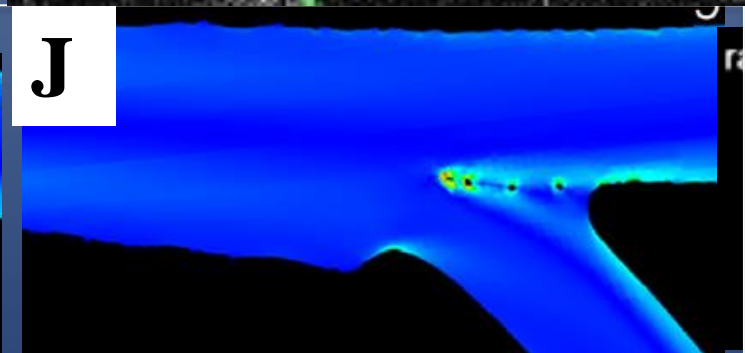
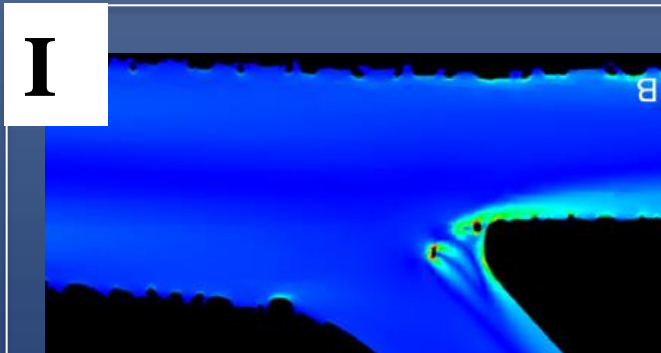
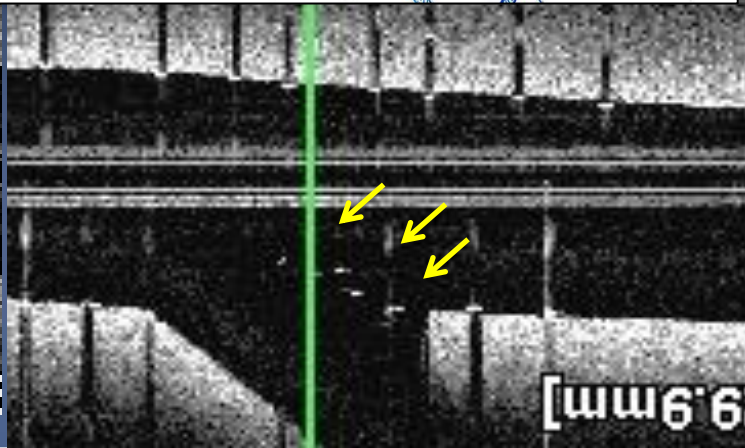
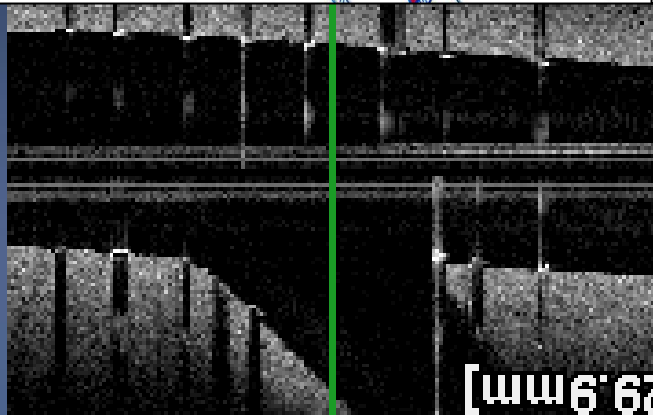
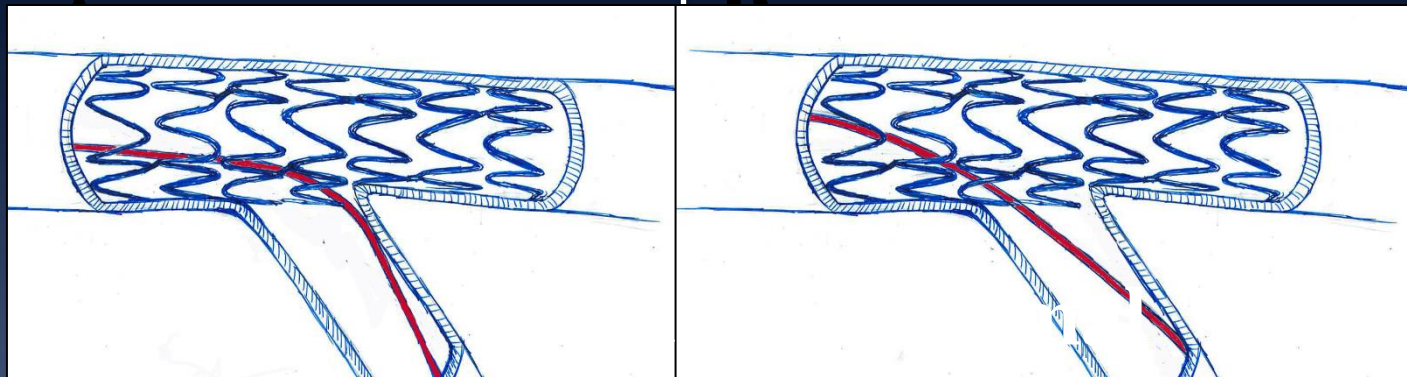
GUEST EDITOR: Adnan Kastrati, MD; Deutsches Herzzentrum München, Munich, Germany

This paper also includes supplementary data published online at: http://www.pconline.com/eurointervention/148th_issue/269

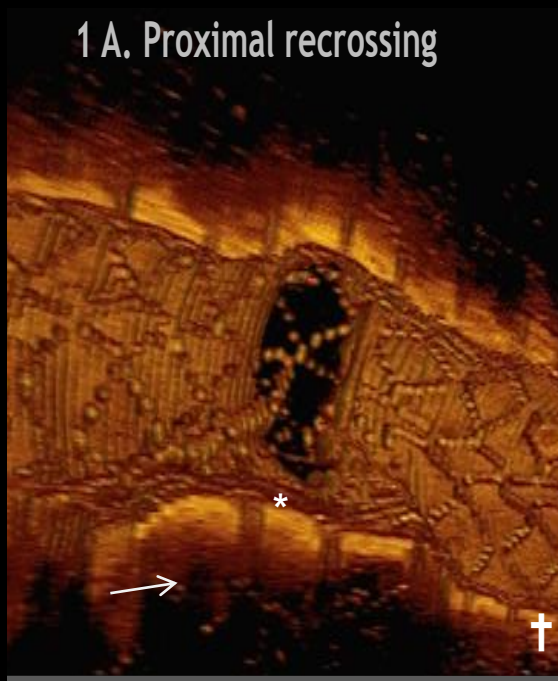


Impact of recrossing wire position on shear stress after ballooning

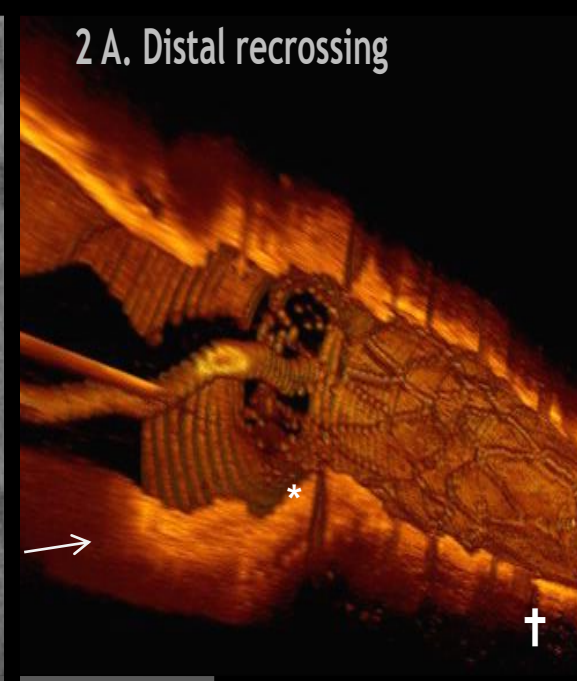
Onuma et al. Euro intervention
Foin et al.



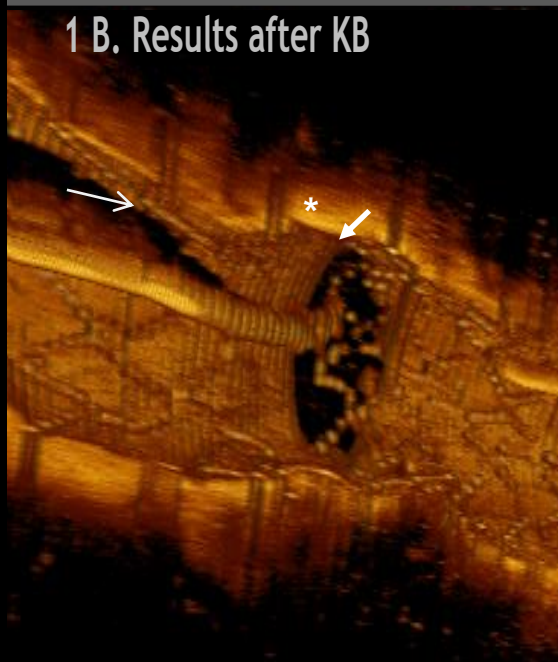
1 A. Proximal recrossing



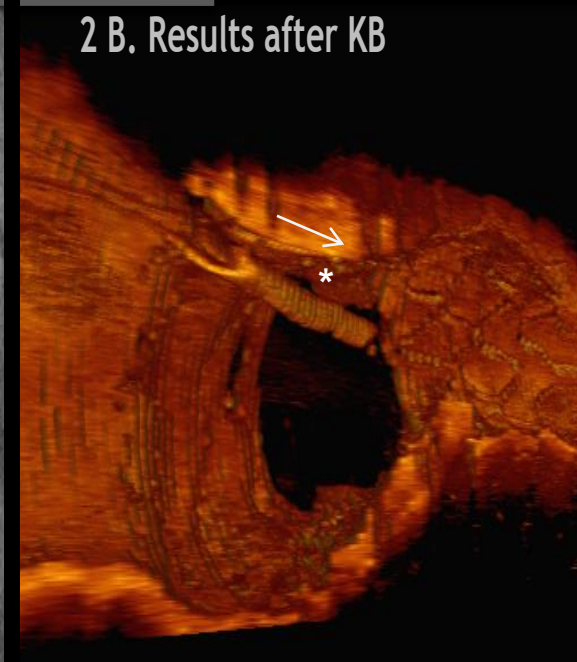
2 A. Distal recrossing



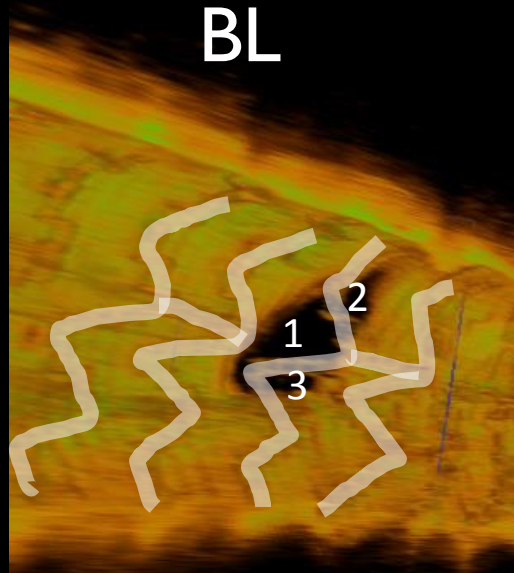
1 B. Results after KB



2 B. Results after KB



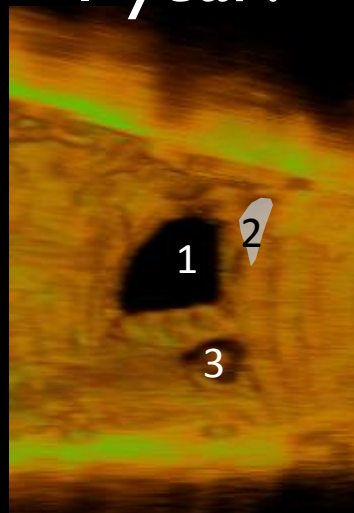
BL



3 compartments

Total surface: 0.91 mm²

1 year:

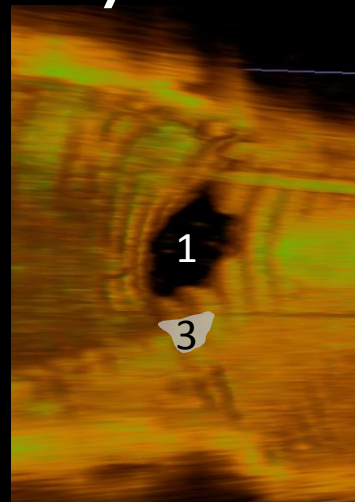


2 compartments

Surface: 0.81 mm²

Cell nr 2
got occluded

3 years:

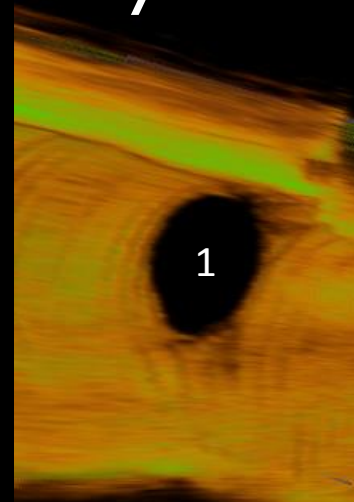


1 compartment

Surface: 0.77 mm²

Cell nr 3
got occluded

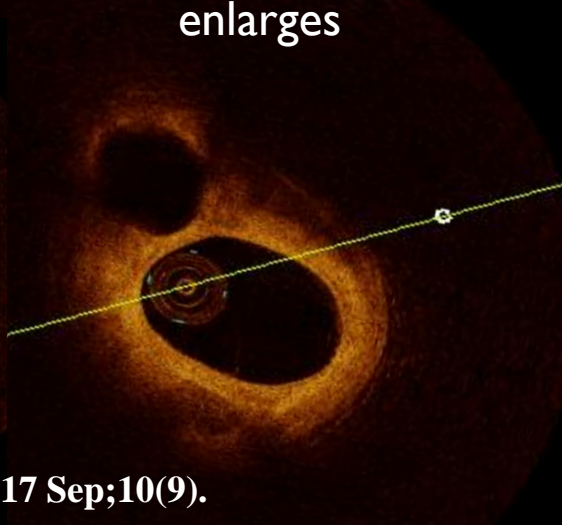
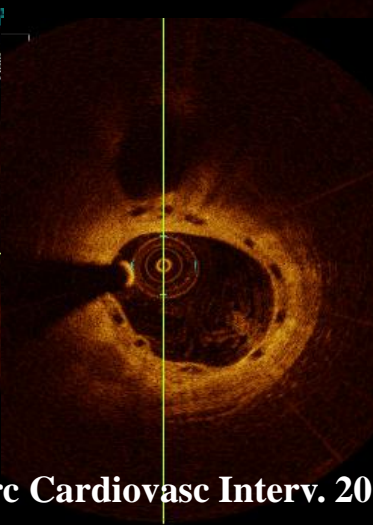
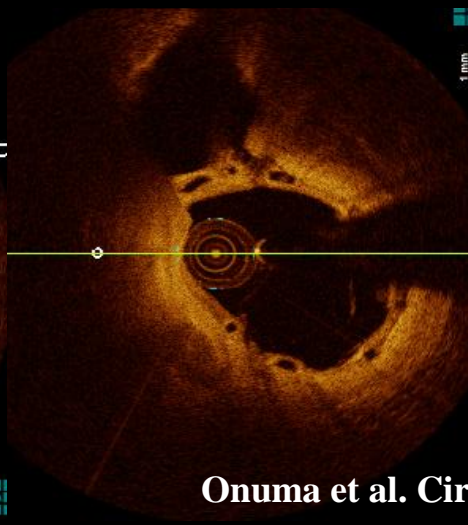
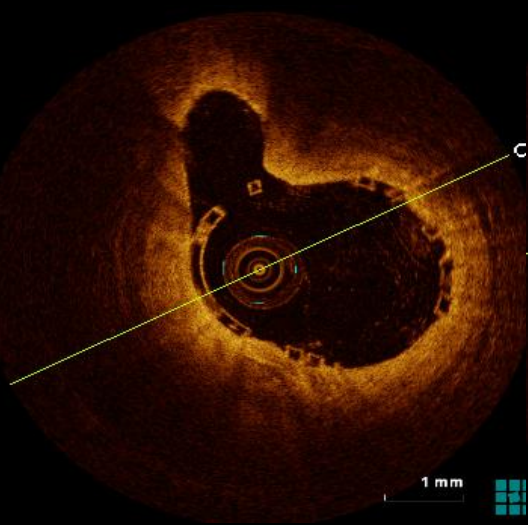
5 years:



1 compartment

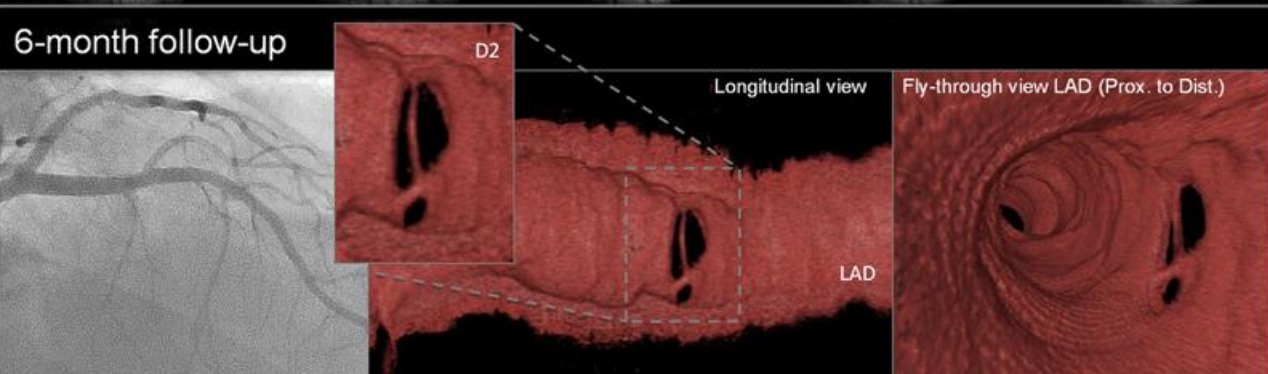
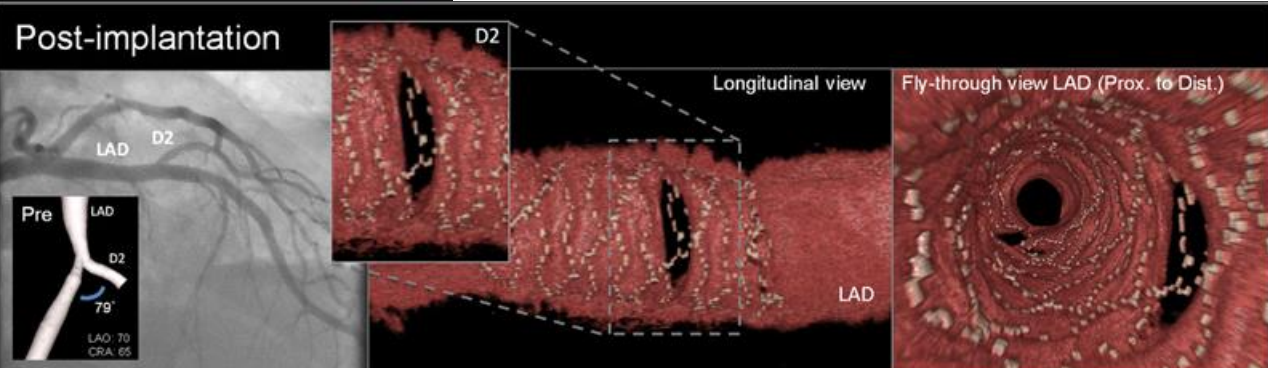
Surface: 1.11 mm²

The remaining
open compartment
enlarges



Serial 2- and 3-Dimensional Visualization of Side Branch Jailing After Metallic Stent Implantation

To Kiss or Not to Kiss . . . ?



Case: 64 years old male

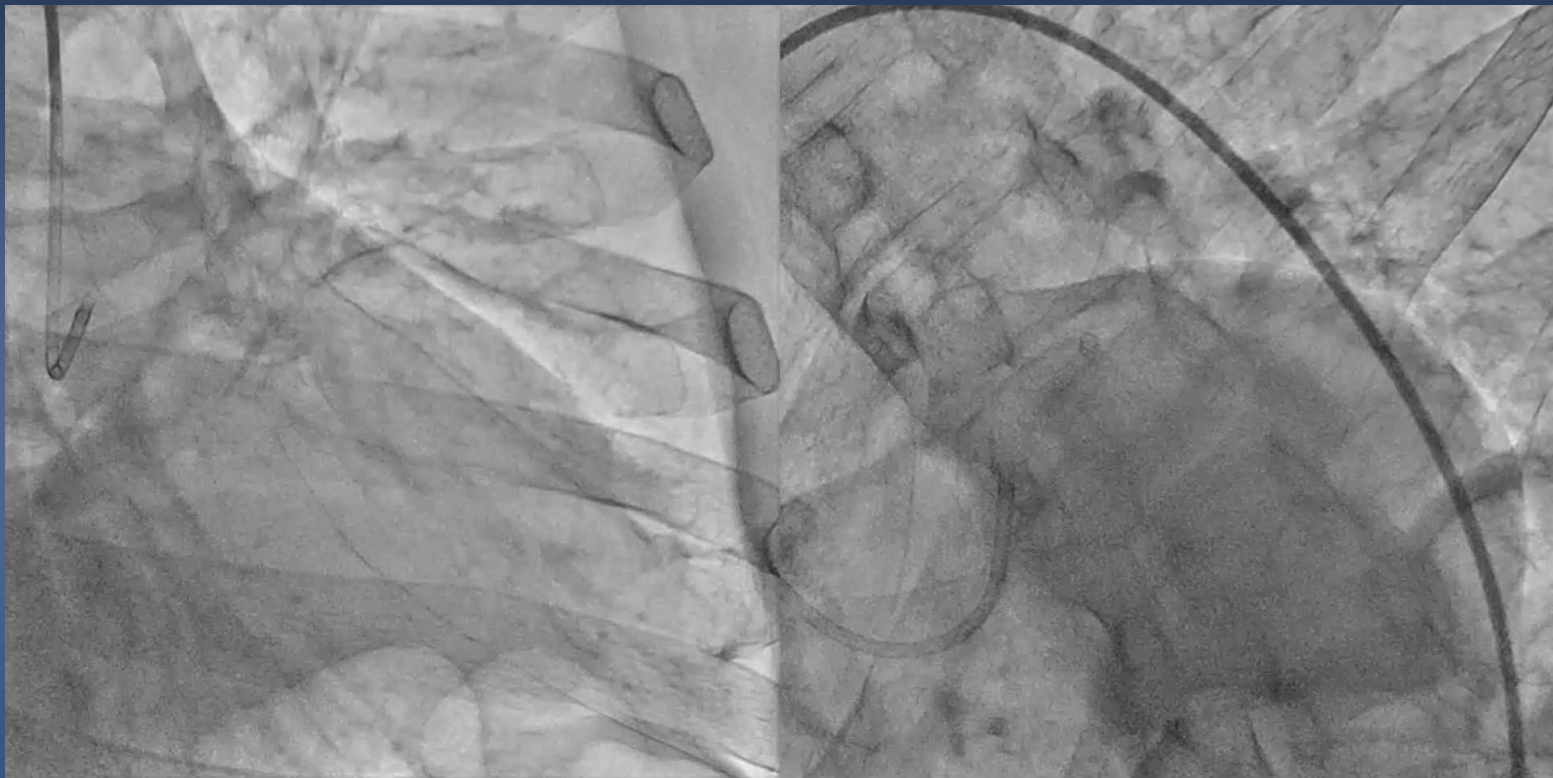
Angiography was performed for stable angina



RCA intact

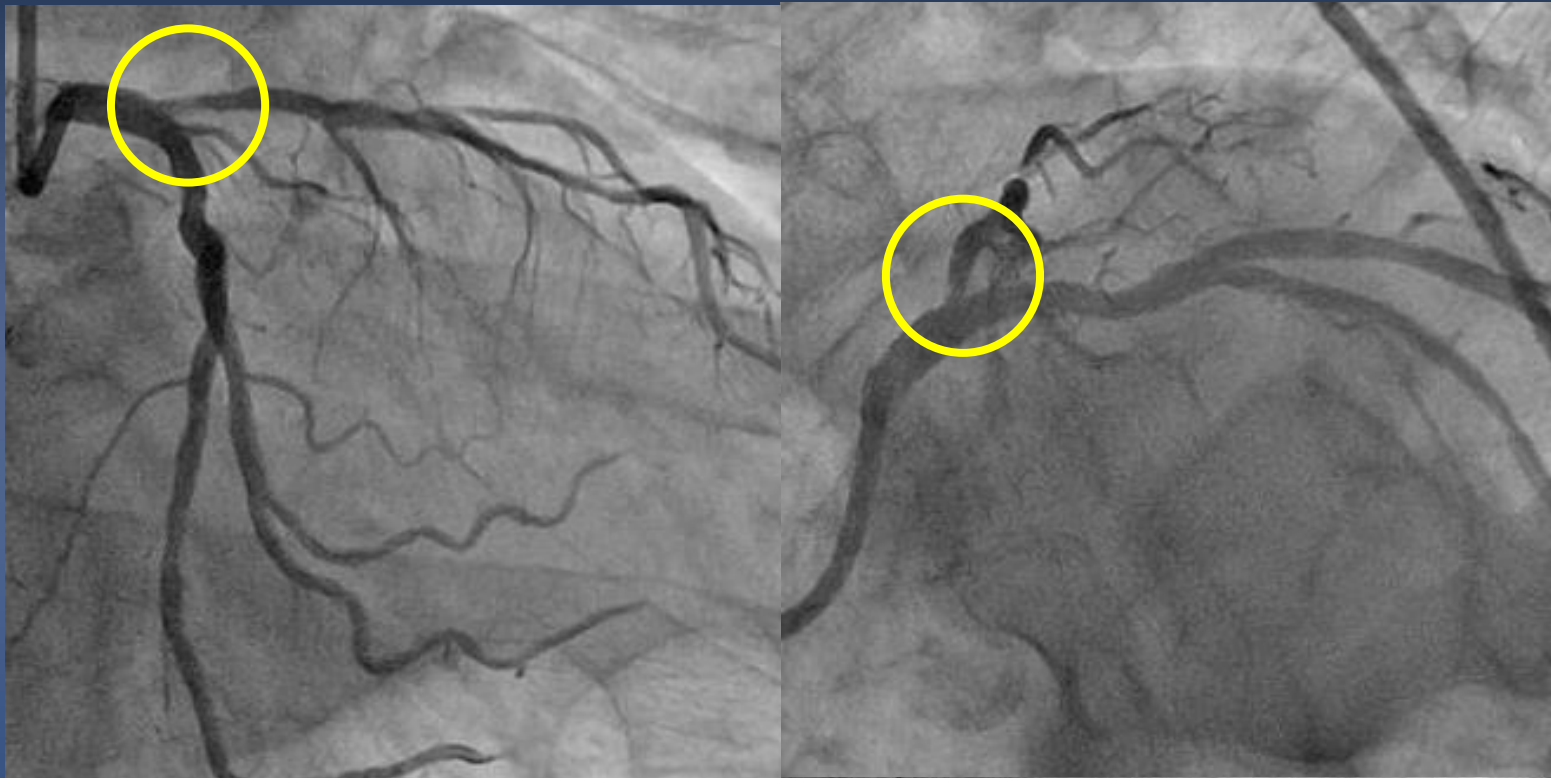
Case: 64 years old male

Angiography was performed for stable angina



Case: 64 years old male

Angiography was performed for stable angina



Severe stenosis at the ostium of LAD

Percutaneous Coronary Intervention



Approach:

Right Common Femoral Artery

Guiding Catheter:

7 Fr. size EBU 3.5 Launcher

Strategy:

IVUS guided single stenting with KBT

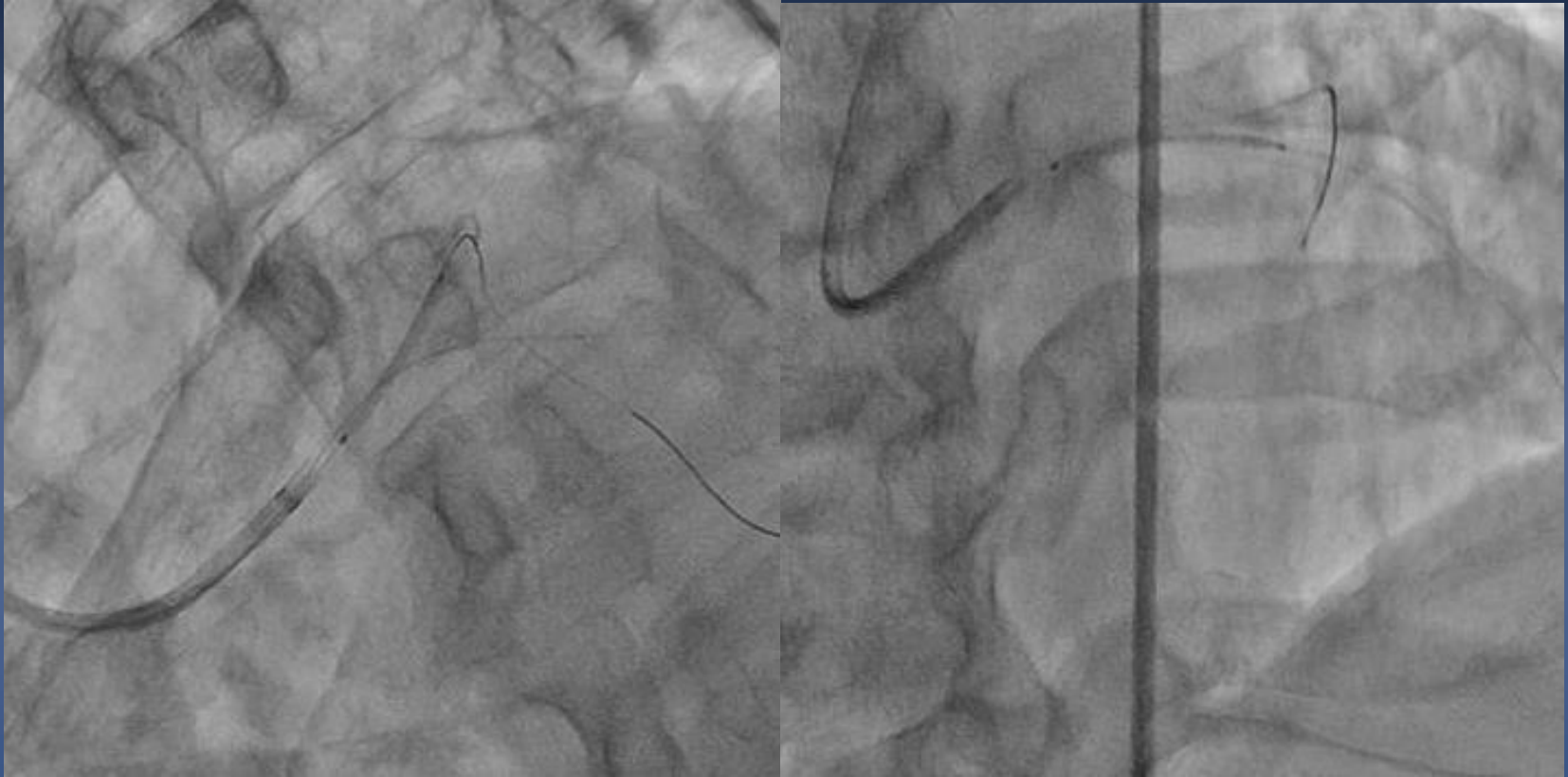
- Wire crossing to LAD and LCx
- Stenting from LMT to LAD
- Proximal Optimization Technique (POT)
- Re-crossing wire to LCx
- Kissing Balloon Technique (KBT)
- Finish

POBA



Ballon dilatation by score flex (3.25/10 mm)

Stent Deployment



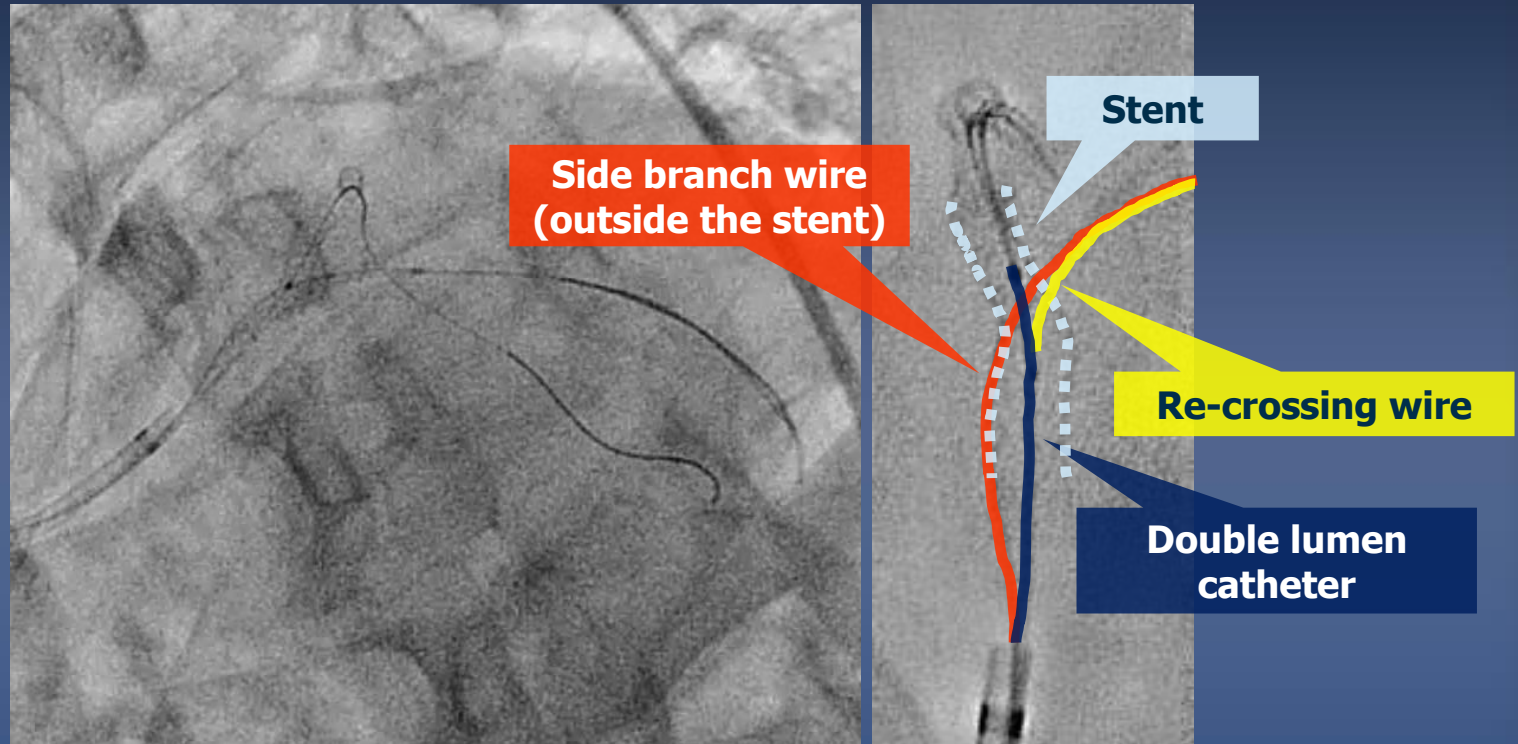
BMX-J (Biolimus A9 eluting stent) 3.5/24 mm
deployment

Proximal Optimization Technique



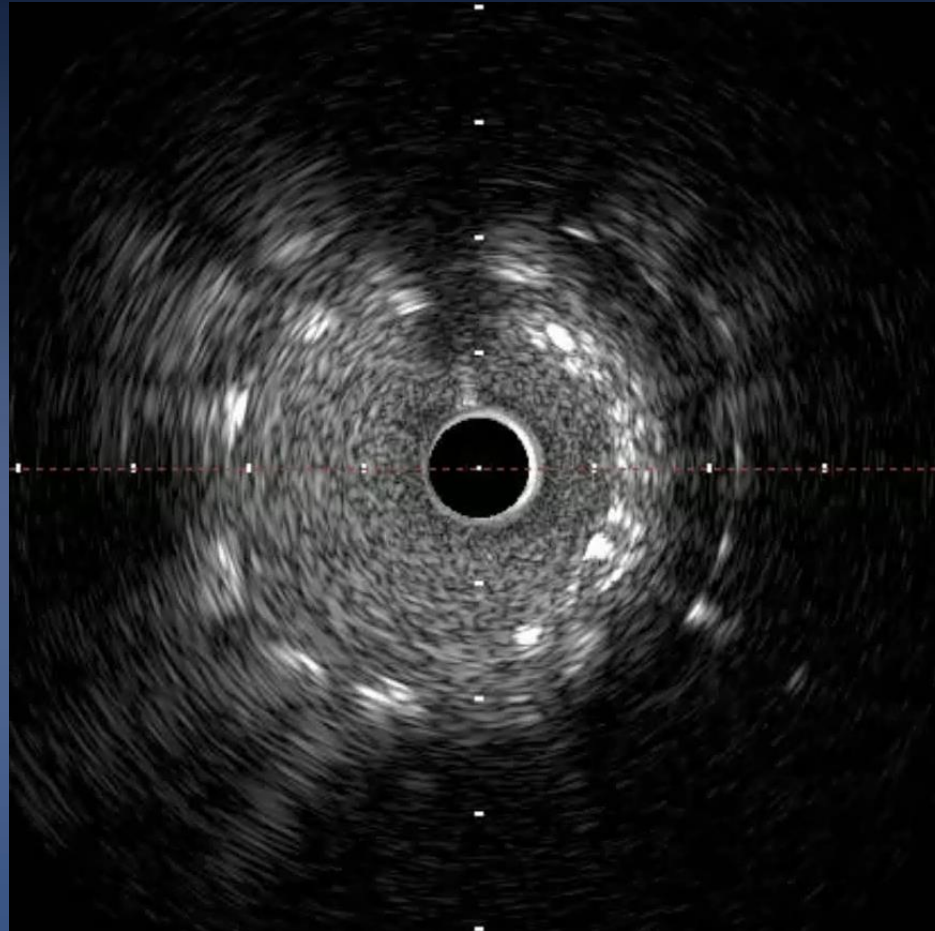
POT by non-compliant balloon (4.5/6 mm)

Wire re-crossing to side branch after stent deployment



Re-crossing a wire by using Crusade (double lumen catheter)

IVUS after 1st re-crossing wire



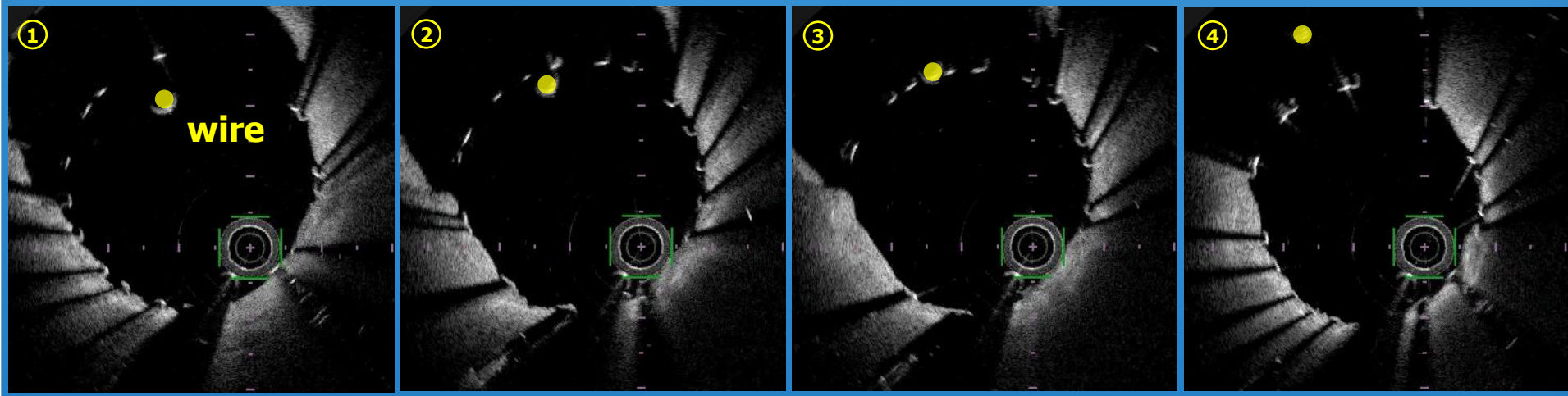
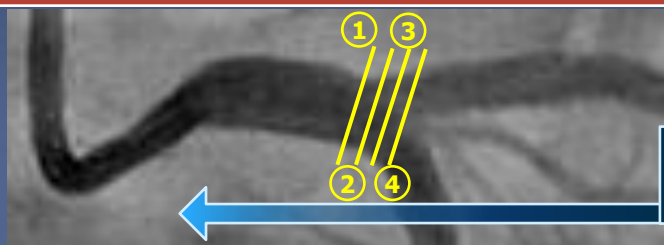
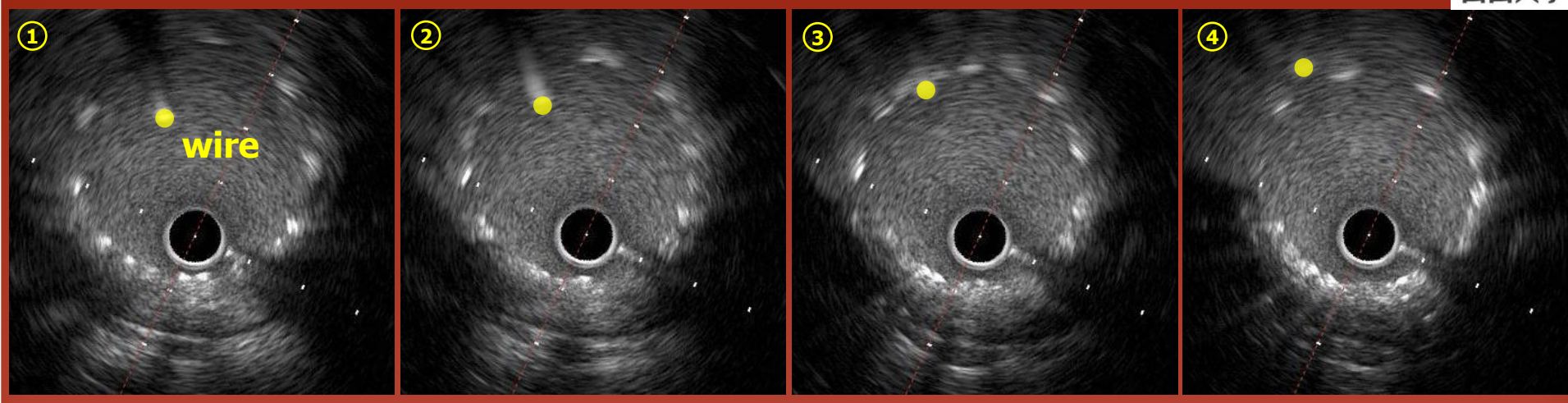
It's HARD to detect the wire re-crossing position!

OCT after 1st re-crossing wire

2D OCT



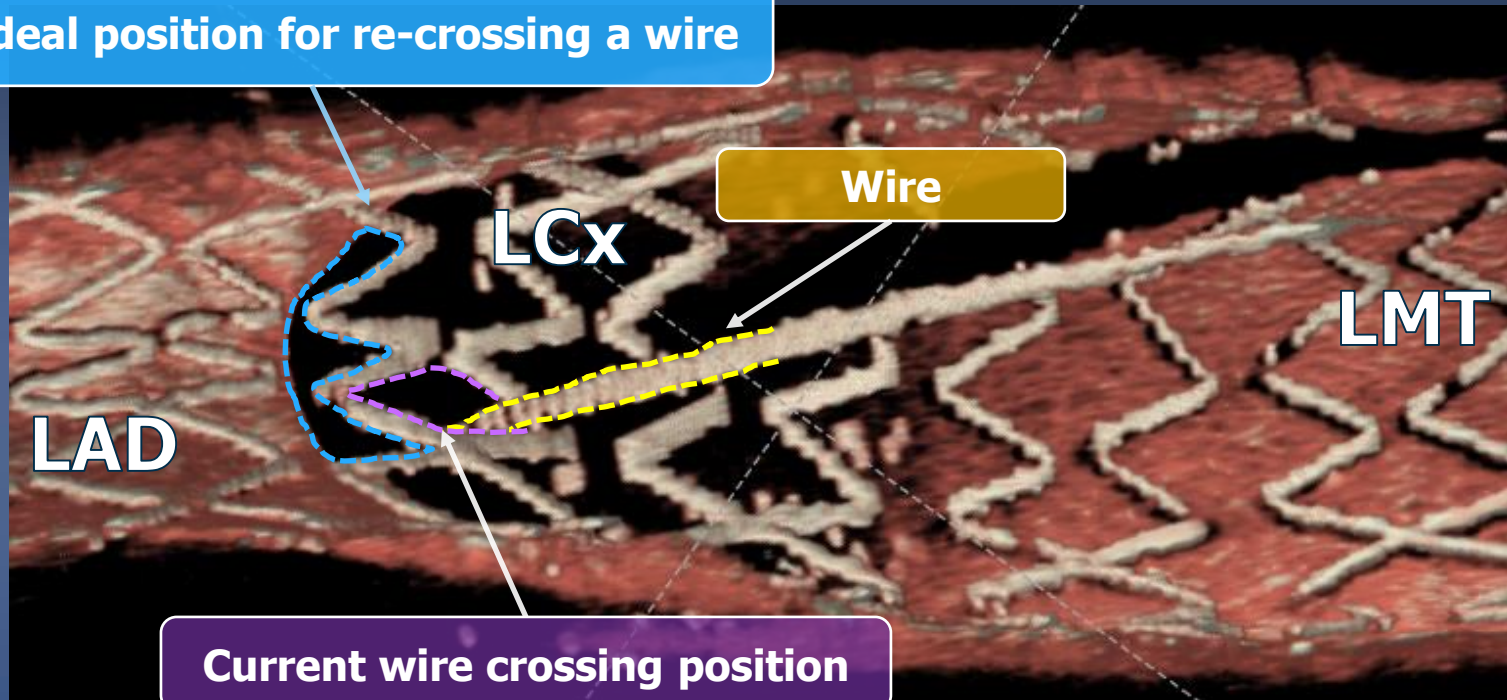
Comparison between IVUS and OCT



OCT after 1st re-crossing wire

3D OCT

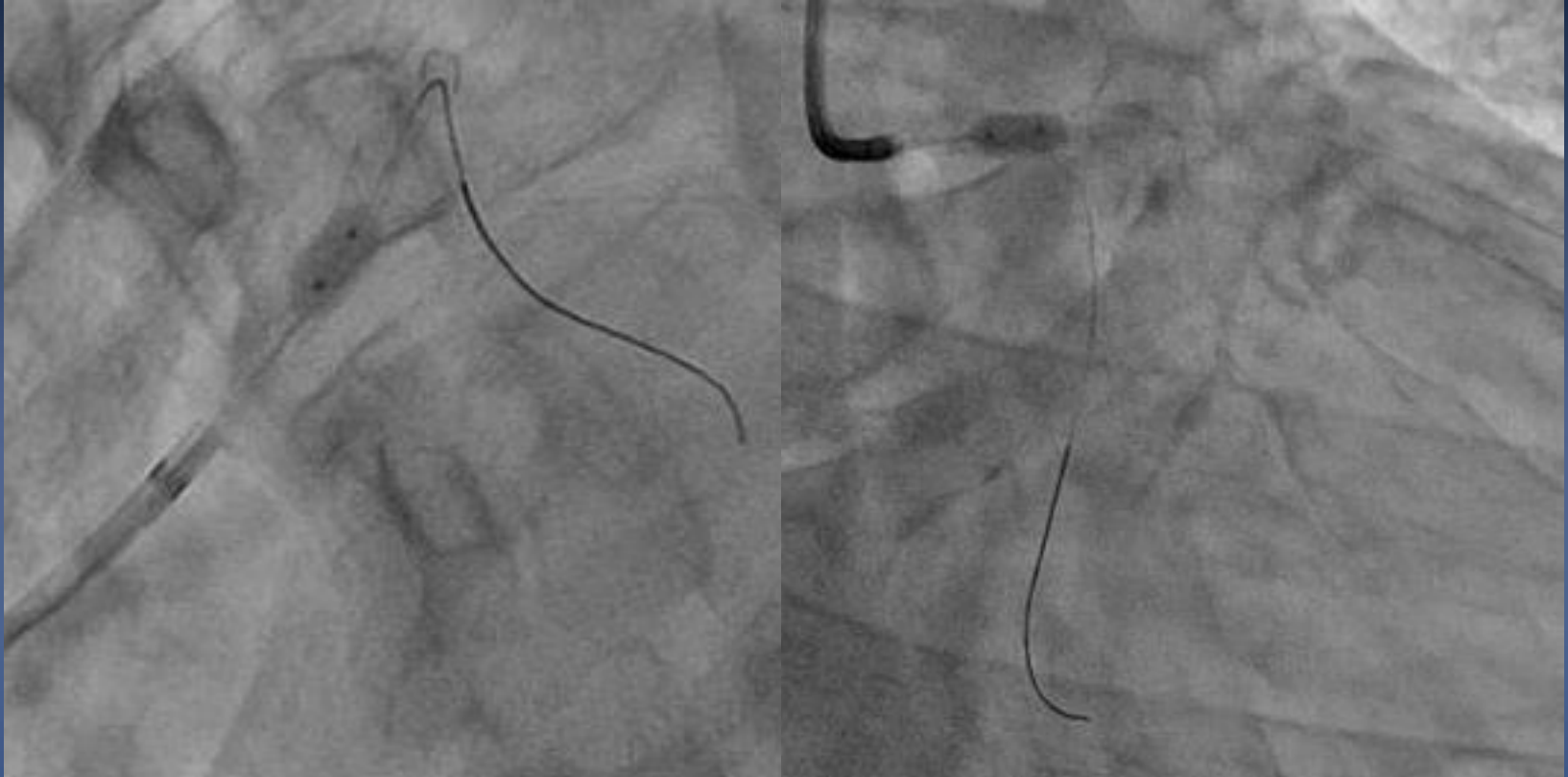
The ideal position for re-crossing a wire



Current wire crossing position

Try to re-cross the 2nd wire to ideal cell position

Re-POT



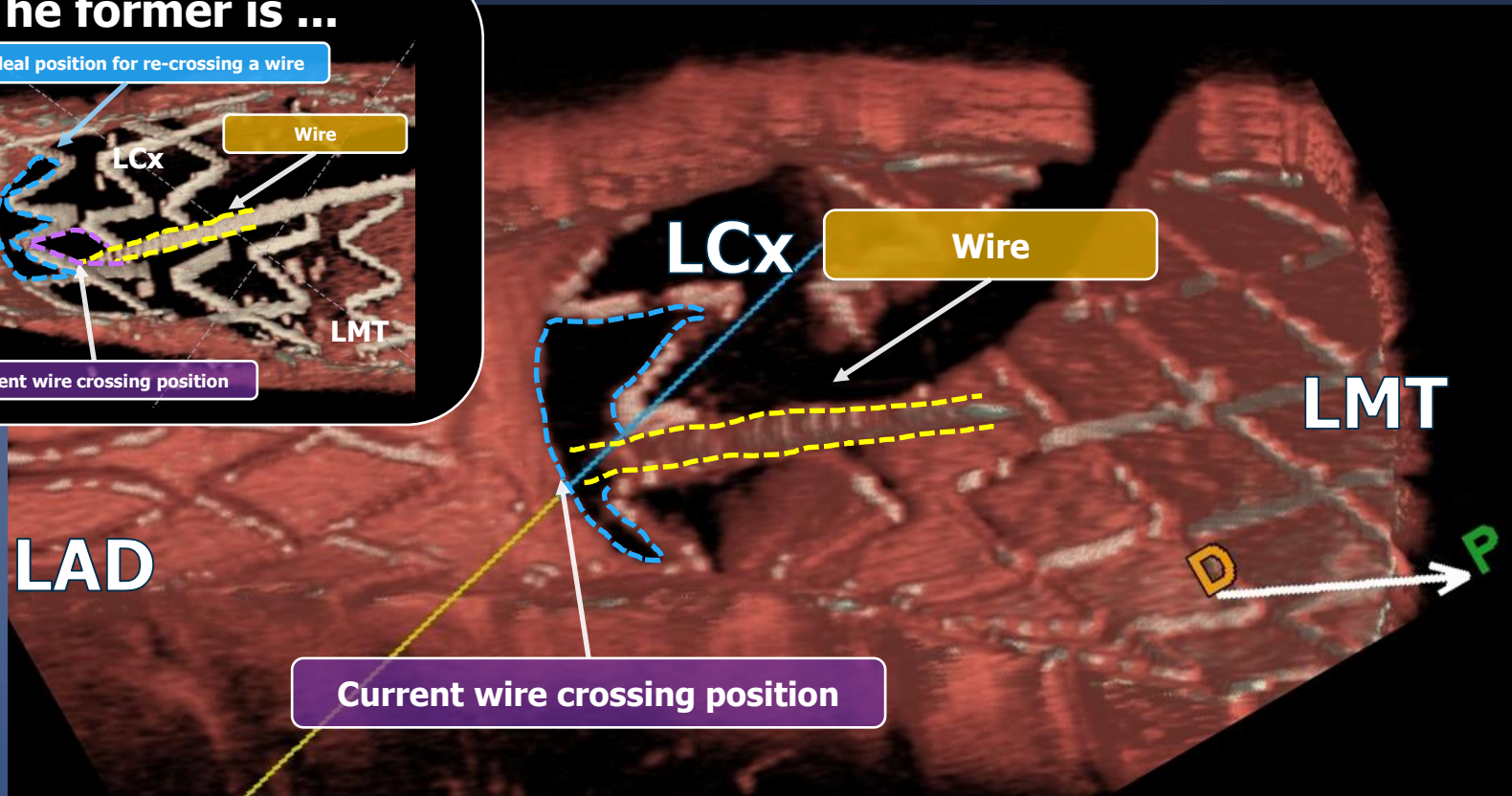
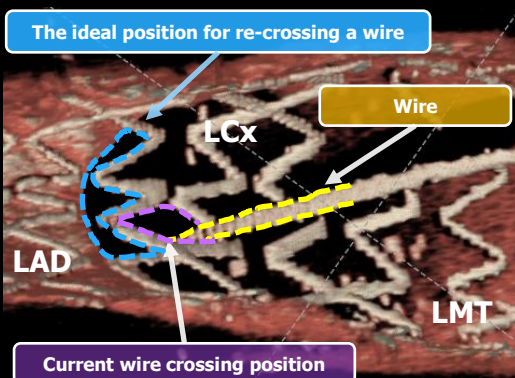
2nd POT at more distal position (near the carina) than 1st POT
by non-compliant balloon (4.5/6 mm)

OCT after 2nd re-crossing wire

3D OCT

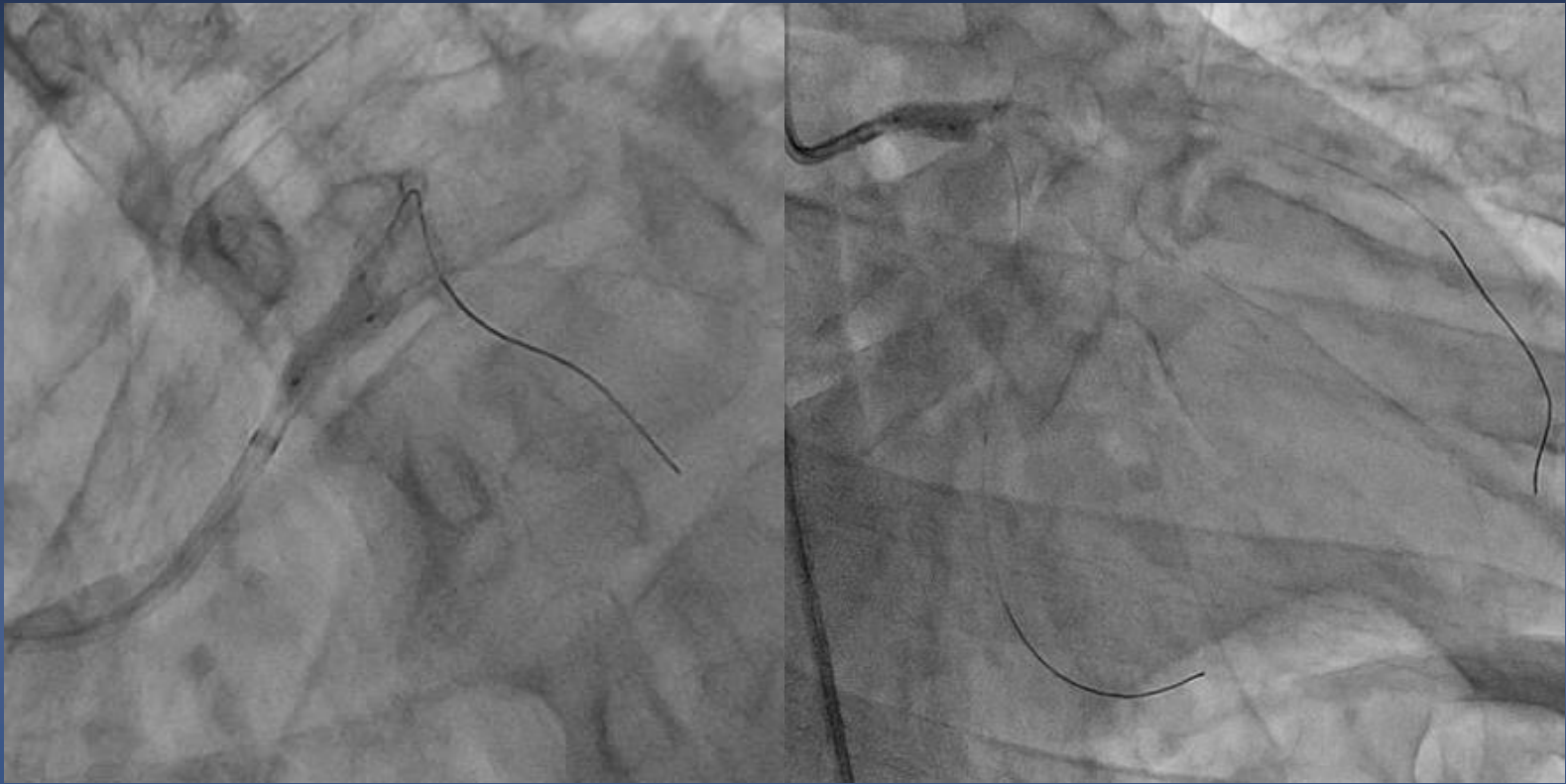
The former is ...

The ideal position for re-crossing a wire



Successfully the wire was crossed through the ideal cell position!

Kissing Balloon Technique

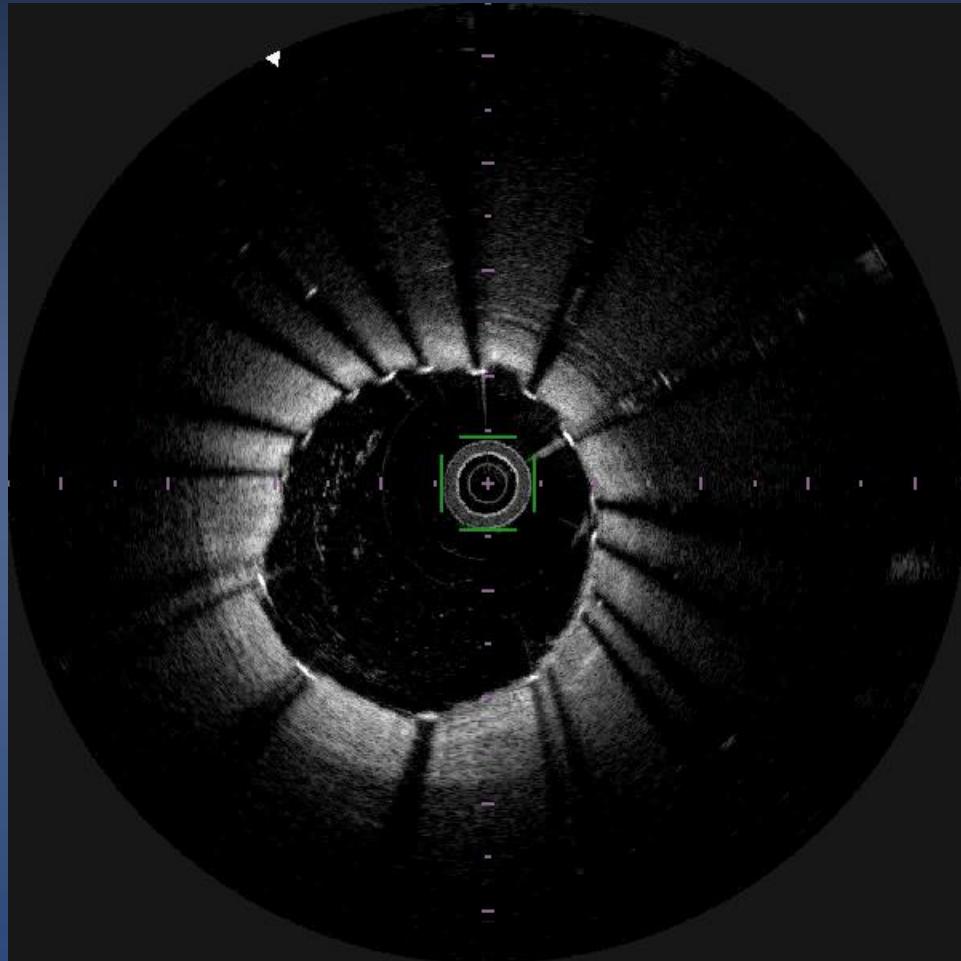


Non-compliant balloon 3.5/15 mm for LAD
Glider (semi-compliant short balloon) 3.5/4 mm for LCx

Courtesy of Drs. Miyazaki and Okamura

OCT after KBT

2D OCT

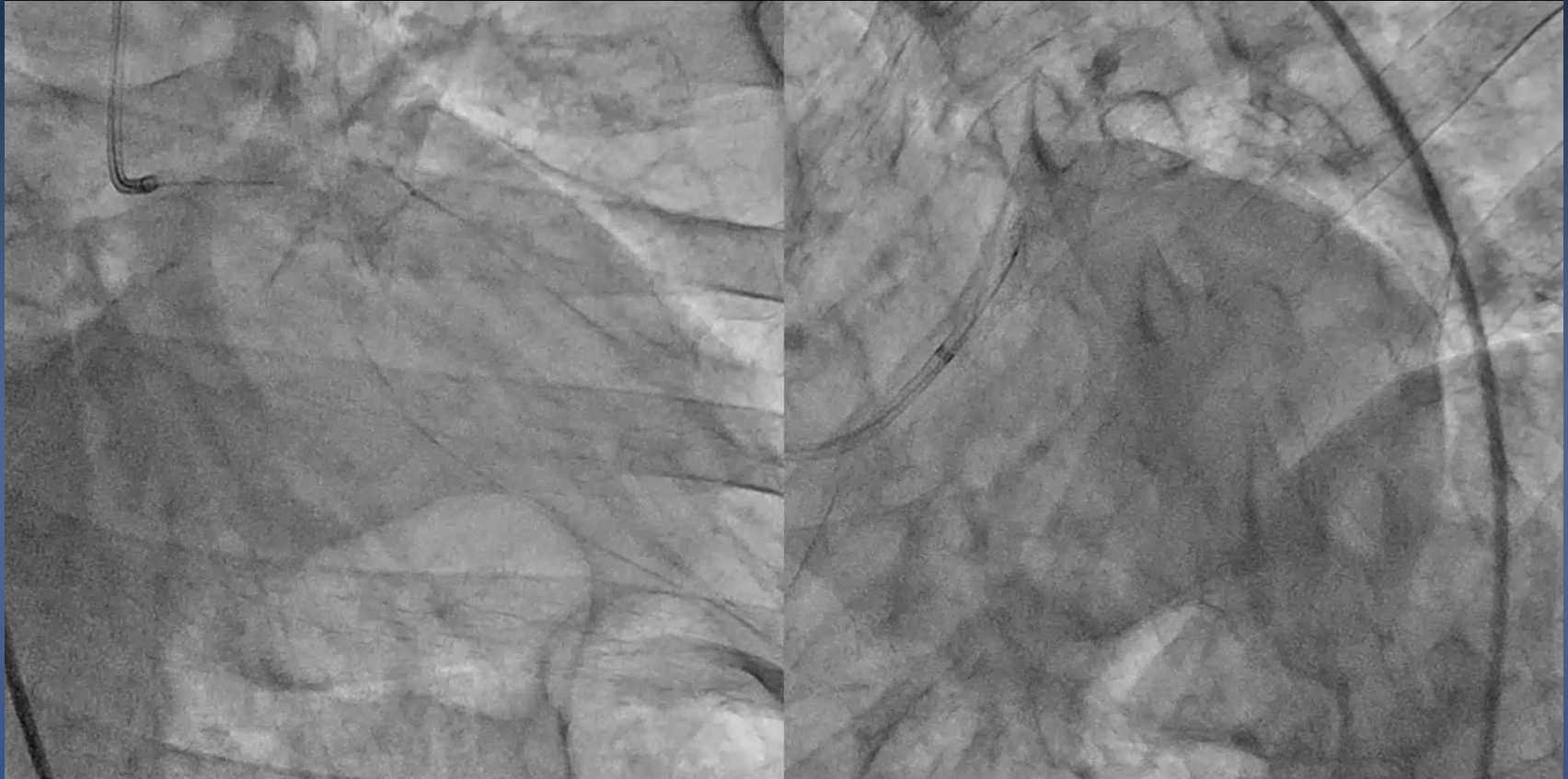


OCT after KBT

3D OCT



Final angiography



Ongoing RCTs comparing OCT versus angiography-guided bifurcation PCI

| | Number of patients | Endpoint |
|-----------------------|--|---|
| DOCTOR Recross | 60 (angiography: 30, OCT: 30) | Cross sectional stent strut malapposition in the main vessel bifurcation segment facing the side-branch ostium after procedure |
| OPTIMUM | 103 (angiography guided: 53, OCT guided: 53) | Acute incomplete strut malapposition in bifurcation |
| OCTOBER | 1200 (angiography guided: 600, OCT guided: 600) | To compare median two-year clinical outcome after OCT guided vs. standard guided revascularization of patients requiring complex bifurcation stent implantation |

OPTIMUM study

Bifurcation PCI with planned both POT and final KBD



3D OFDI guidance arm

no guidance arm

Implantation of Ultimaster stent

POT

Wire recross

Online
&

Final KBD

OFDI

Implantation of Ultimaster stent

POT

Wire recross

Final KBD

OFDI

Primary outcome will be presented at EuroPCR 2019!

**Primary endpoint
Acute ISA at bifurcation**

Summary

- **To re-cross a wire to the distal stent cell is important in bifurcation PCI to eliminate stent struts at the carina.**
- **In this case, a 64-year-old male was treated with biolimus eluting stent implantation for LMT distal bifurcation lesion. Operators started the procedure with IVUS guidance and switched to OFDI in order to better visualize configuration of the re-crossing wire and to guide the re-crossing point. After repositioning the wire under the OFDI guidance, optimal stent expansion was achieved without any overhanging struts in front of the jailed side branch ostium.**
- **Further clinical evidence is needed to demonstrate clinical benefit of 3D-OFDI guided PCI to bifurcation lesion.**