Left Main OCT-guided PCI

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2018 ESC/EACTS Guidelines on myocardial revascularization

Recommendations on intravascular imaging for procedural optimization

Recommendations	Class[a]	Level[b]
IVUS or OCT should be considered in selected patients to optimize stent implantation.[603,612,651–653]	IIa	B
IVUS should be considered to optimize treatment of unprotected left main lesions.[35]	IIa	B

IVUS = intravascular ultrasound; OCT = optical coherence tomography.
[a]Class of recommendation.
[b]Level of evidence.

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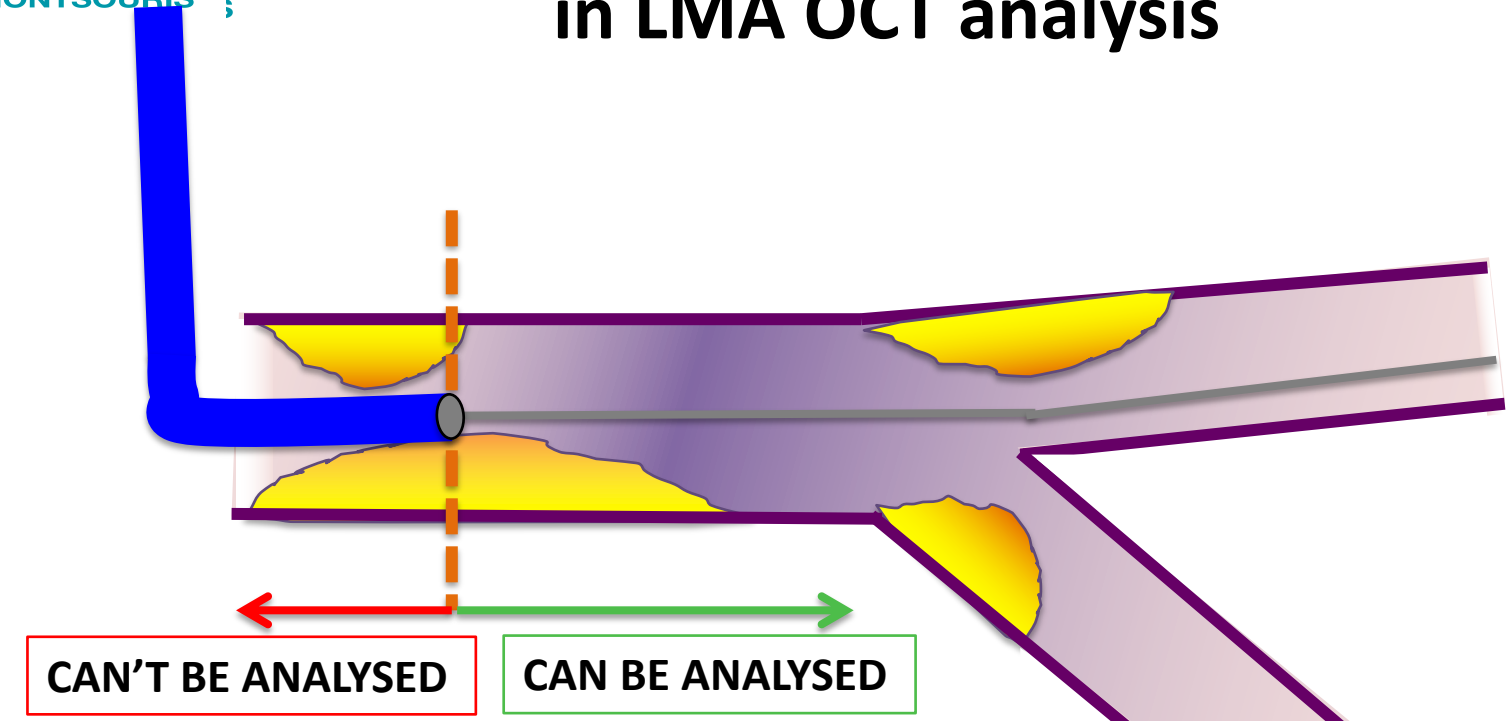
Technical issues in LMA OCT analysis



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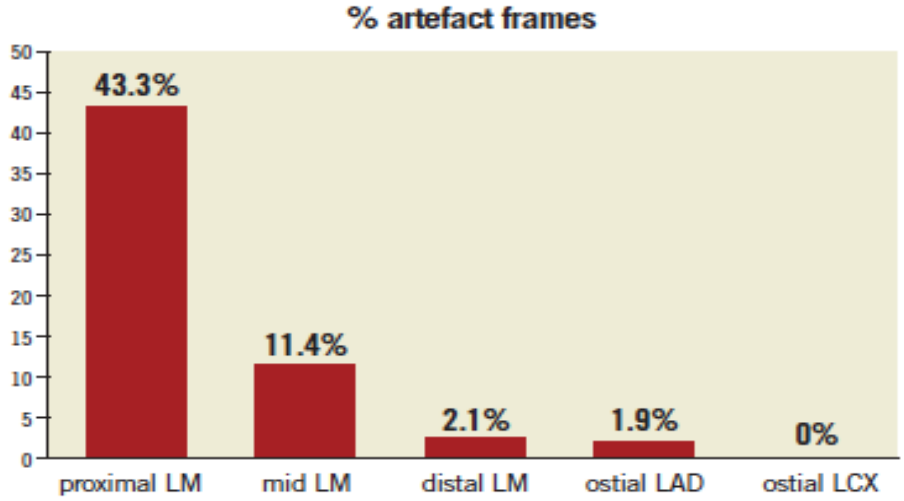
IS LM OCT ANALYSIS FEASIBLE ?

ARTEFACTS

Retrospective analysis of 54 LMA OCT runs
% non-analysable images



Burzotta F et al. , Eurointervention 2015

VESSEL SIZE

TROFI trial
N=46 LMA OCT runs
% analysable quadrants

No. of frames with out-of-view phenomenon	
Proximal right coronary artery, n (%)	56/5,488 (1.0)
≤1 quadrant, n (%)	56/5,488 (1.0)
>1 quadrant and ≤2 quadrants, n (%)	0/5,488 (0)
>2 quadrants and ≤3 quadrants, n (%)	0/5,488 (0)
>3 quadrants and ≤4 quadrants, n (%)	0/5,488 (0)
Left main stem, n (%)	306/3,443 (8.9)
≤1 quadrant, n (%)	68/3,443 (2.0)
>1 quadrant and ≤2 quadrants, n (%)	212/3,443 (6.2)
>2 quadrants and ≤3 quadrants, n (%)	26/3,443 (0.8)
>3 quadrants and ≤4 quadrants, n (%)	0/3,443 (0)

LMA was not entirely analyzed in only 9% of the cases

Muramatsu et al. , Circ J 2013

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TIPS & TRICKS FOR LM OCT ANALYSIS

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TIPS & TRICKS FOR SUCCESSFUL LM OCT ANALYSIS

- Avoid « aggressive » guiding catheter (EBU / AL)
- Increase Field of view
- Improve flush quality

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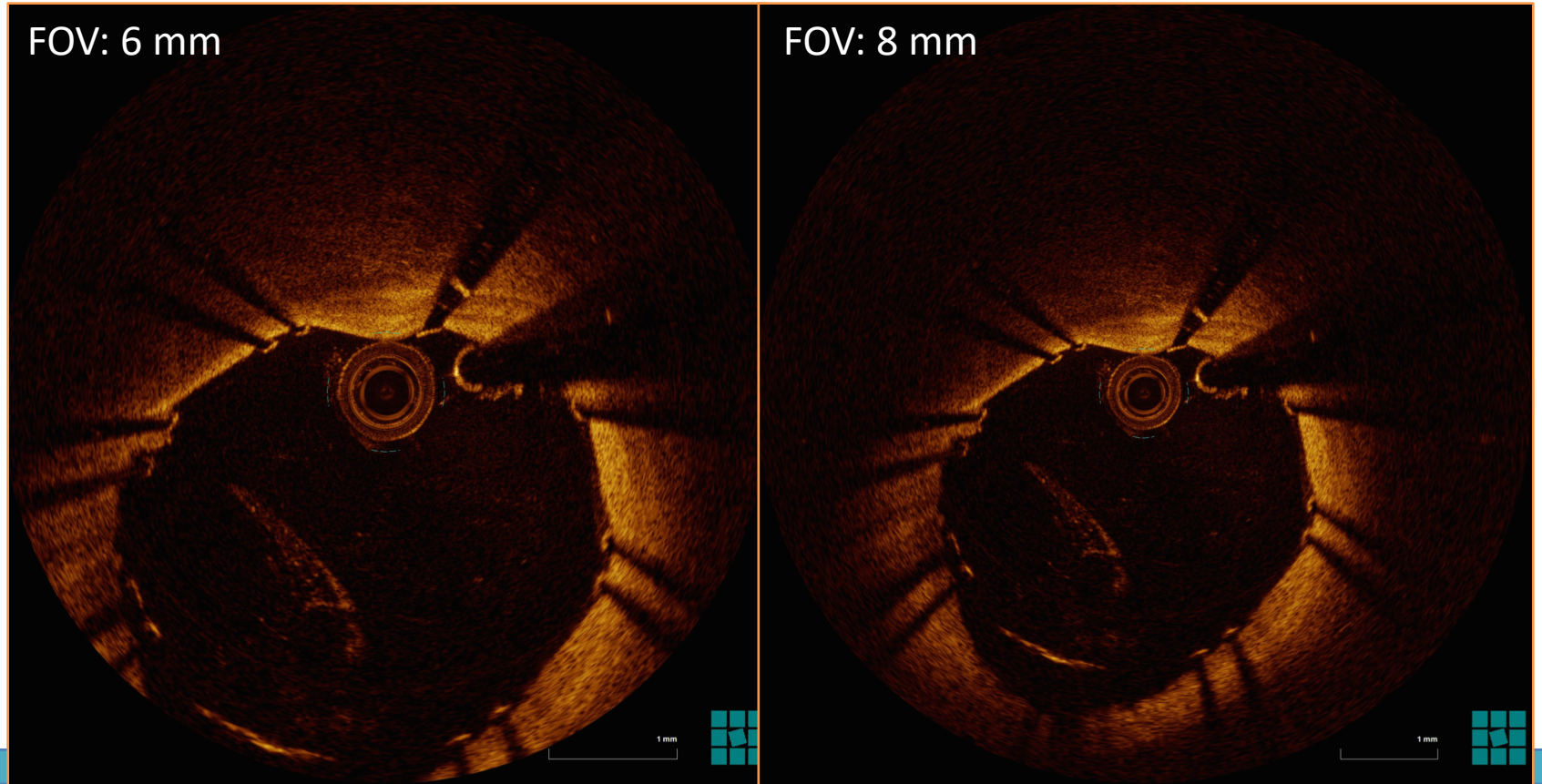
Large vessel ?
Increase field of view !



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Decrease Artefacts? Improve flush quality!

- Coaxial Injection
- Try to get a proper contrast injection with no blood during 5 s !
- Contrast medium volume: 20-25 ml
- Injection debit: 4 – 5 ml/ s

Burzotta et al., Eurointervention 2015

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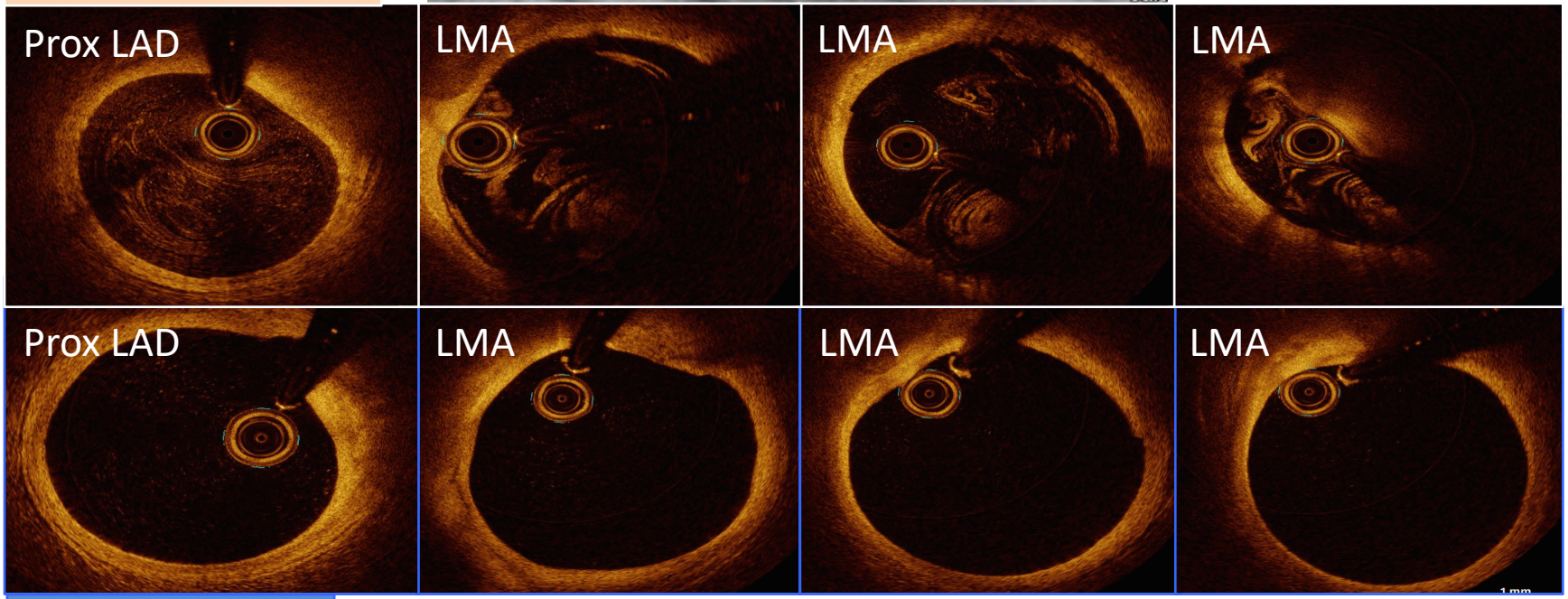
INJECTION 15 cc



INJECTION 25 cc

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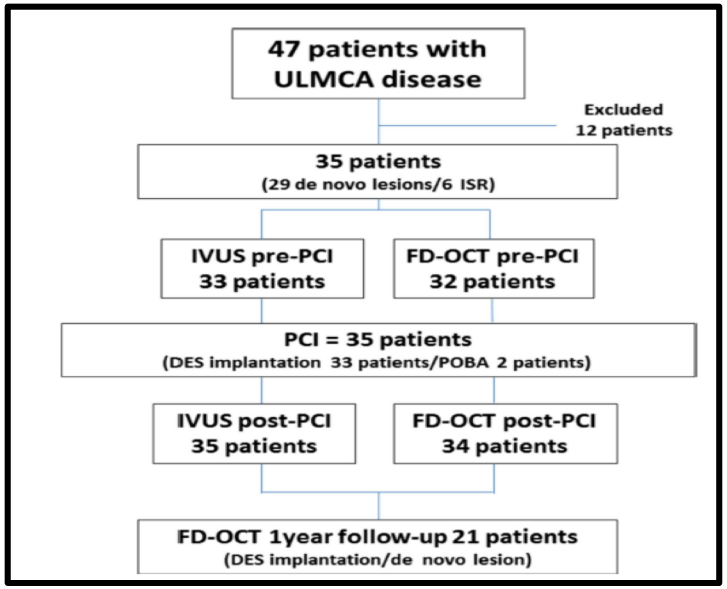
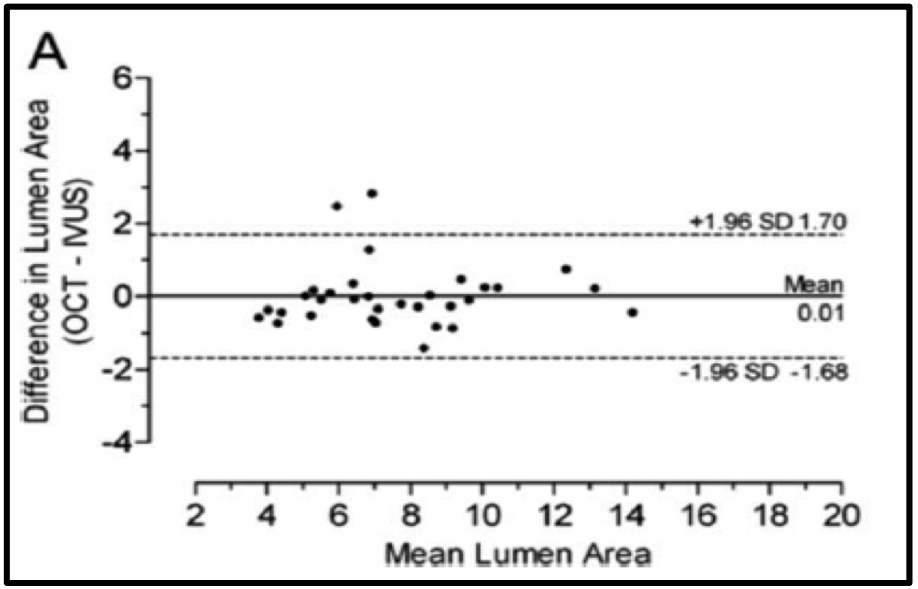
LM dimensions quantifications: OCT vs. IVUS





LM analysis by OCT is feasible

Assessment of LM dimensions by IVUS and OCT are well correlated

Lumen Areas measured by OCT (10.8±2.5) are smaller than in IVUS (11.2±2.6 mm2)

Fujino Y et al. *CCI 2013*:82 (3): E173-83

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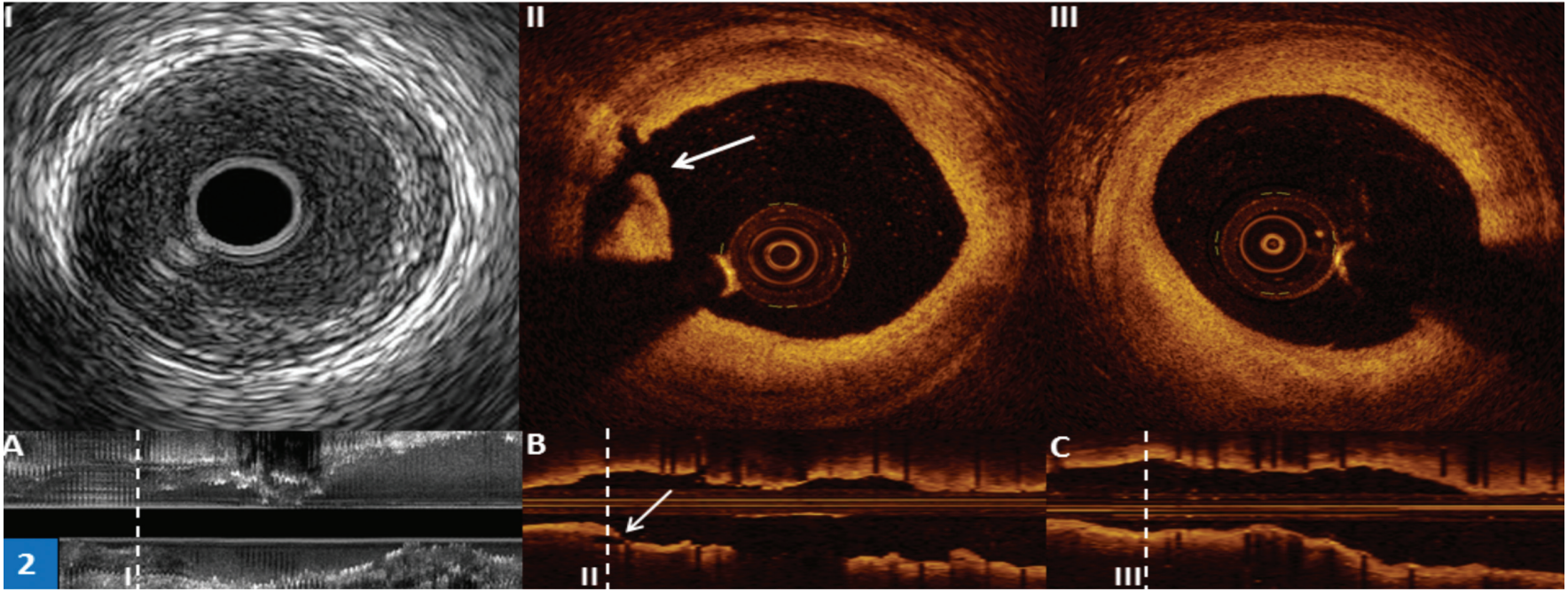
LM PCI quality assessment : OCT vs. IVUS



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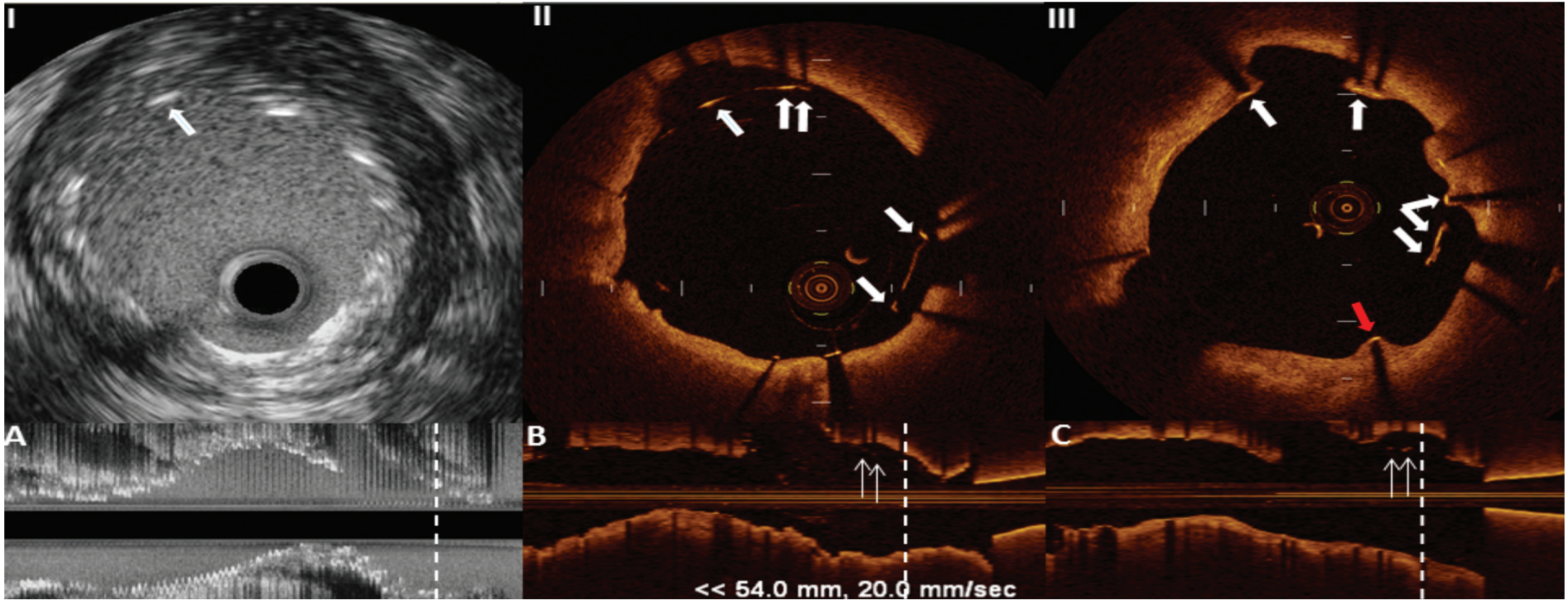

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LM PCI quality assessment : OCT vs. IVUS

	IVUS	FD-OCT	*P*-value
Pre-PCI			
Lesion completeness			
Proximal completeness, *n* (%)	31 (93.9)	4 (12.5)	<0.001
Distal completeness, *n* (%)	33 (100)	29 (90.6)	0.081
Total length (mm)	21.89 ± 10.44	20.72 ± 10.05	0.010
ULM body length (mm)	7.53 ± 3.57	6.45 ± 3.35	0.002
Lumen area (mm^2)			
Mean	7.58 ± 2.61	7.60 ± 2.63	0.936
Min	3.46 ± 1.66	2.94 ± 1.77	0.002
Intraluminal thrombus, *n* (%) PRE	0 (0.00)	3 (9.4)	0.081
Vessel out of screen, n (%)	NA	1 (0.1)	NA

	IVUS	FD-OCT	*P*-value
Post-PCT			
Lumen area (mm^2)			
Mean	10.85 ± 2.47	11.24 ± 2.66	0.132
Min	7.21 ± 2.23	7.18 ± 2.15	0.875
Stent area (mm^2)			
Mean	10.44 ± 2.33	10.49 ± 2.32	0.821
Min	6.88 ± 2.03	6.79 ± 2.09	0.534
Reference			
Lumen area (mm^2)	7.81 ± 2.71	7.94 ± 2.37	0.641
Tissue protruding area (mm^2)	0.11 ± 0.07	0.23 ± 0.09	<0.001
Malapposition area (mm^2)	0.12 ± 0.36	0.43 ± 0.51	<0.001
Malapposition volume (mm^3)	1.95 ± 5.69	7.73 ± 7.60	<0.001
Intraluminal thrombus, *n* (%)	0 (0.00)	2 (5.9)	0.154
Proximal edge dissection, *n* (%)	0 (0.00)	1 (3.0)	0.317
Distal edge dissection, *n* (%)	2 (6.1)	10 (30.3)	0.011

Fujino Y et al. *CCI 2013*:82 (3): E173-83

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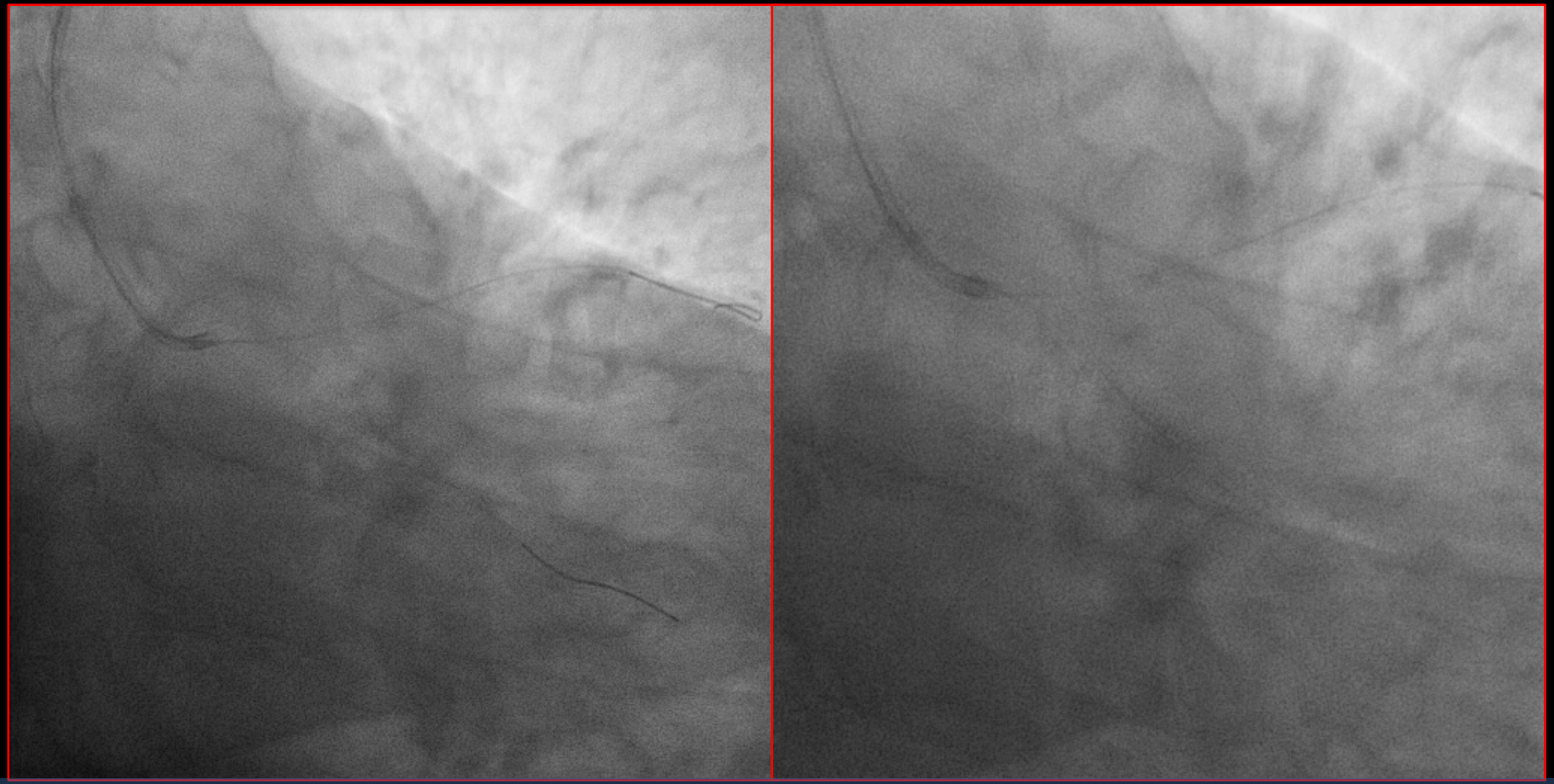
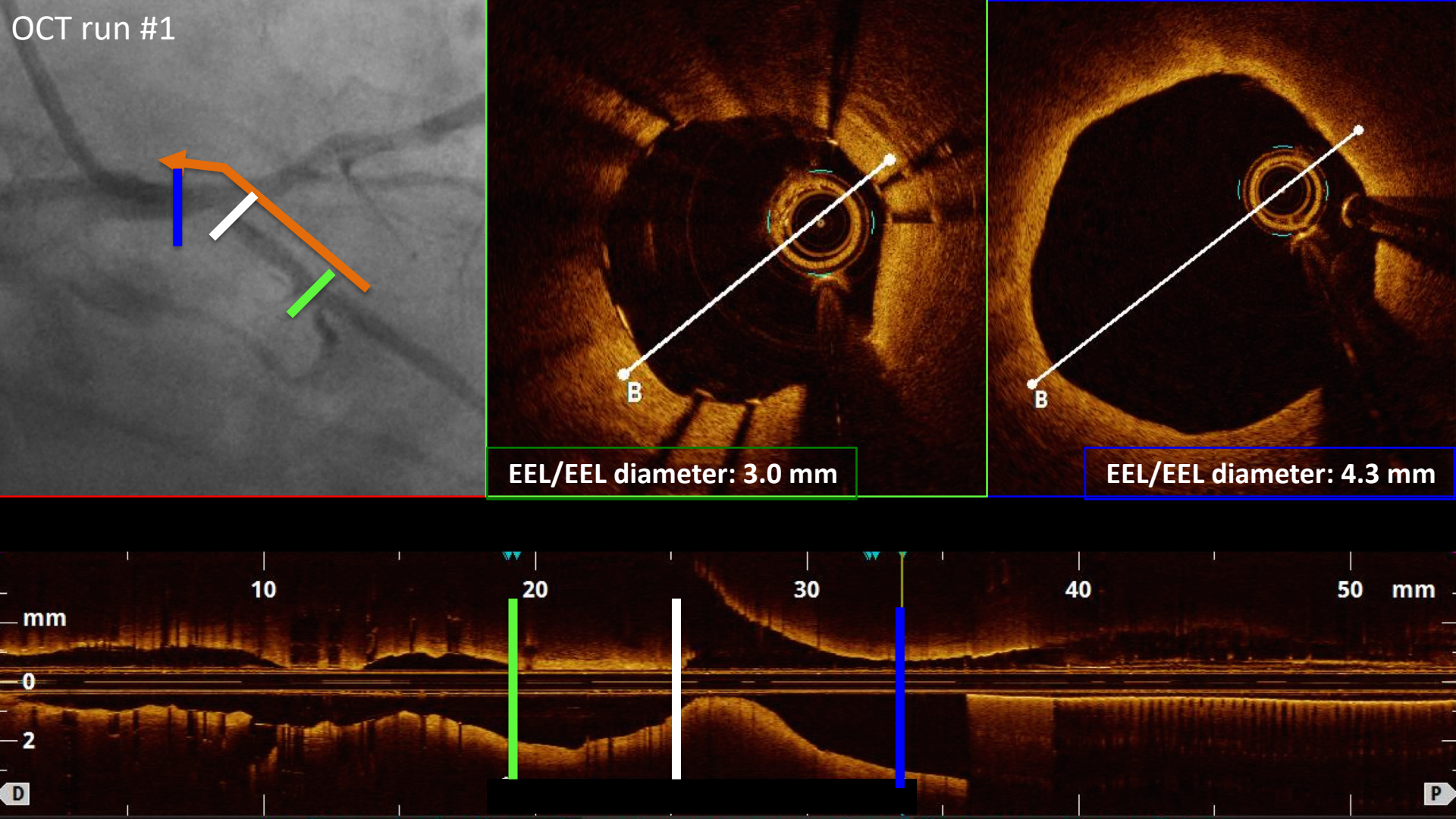
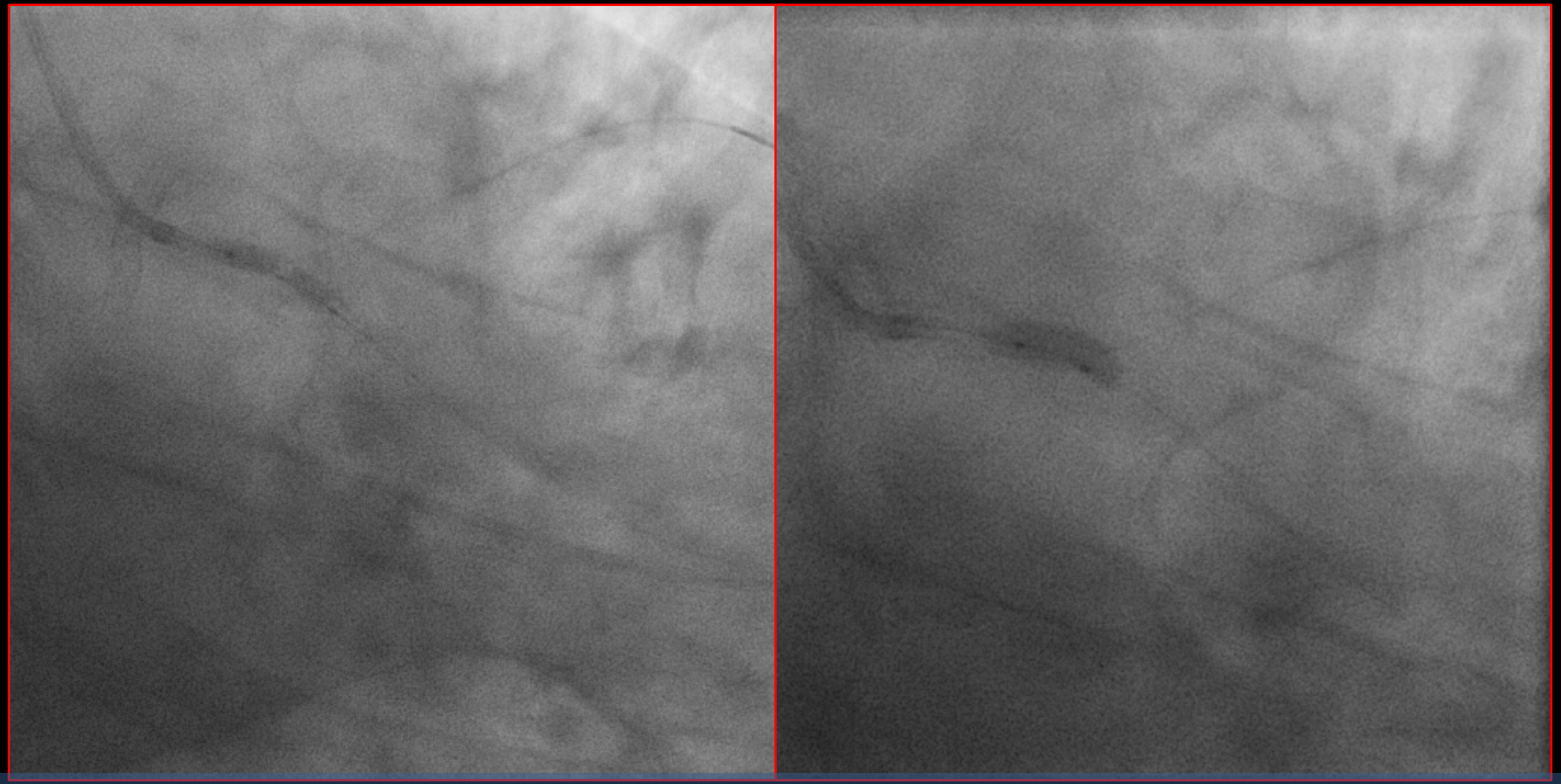
OCT guided LM PCI in daily practice

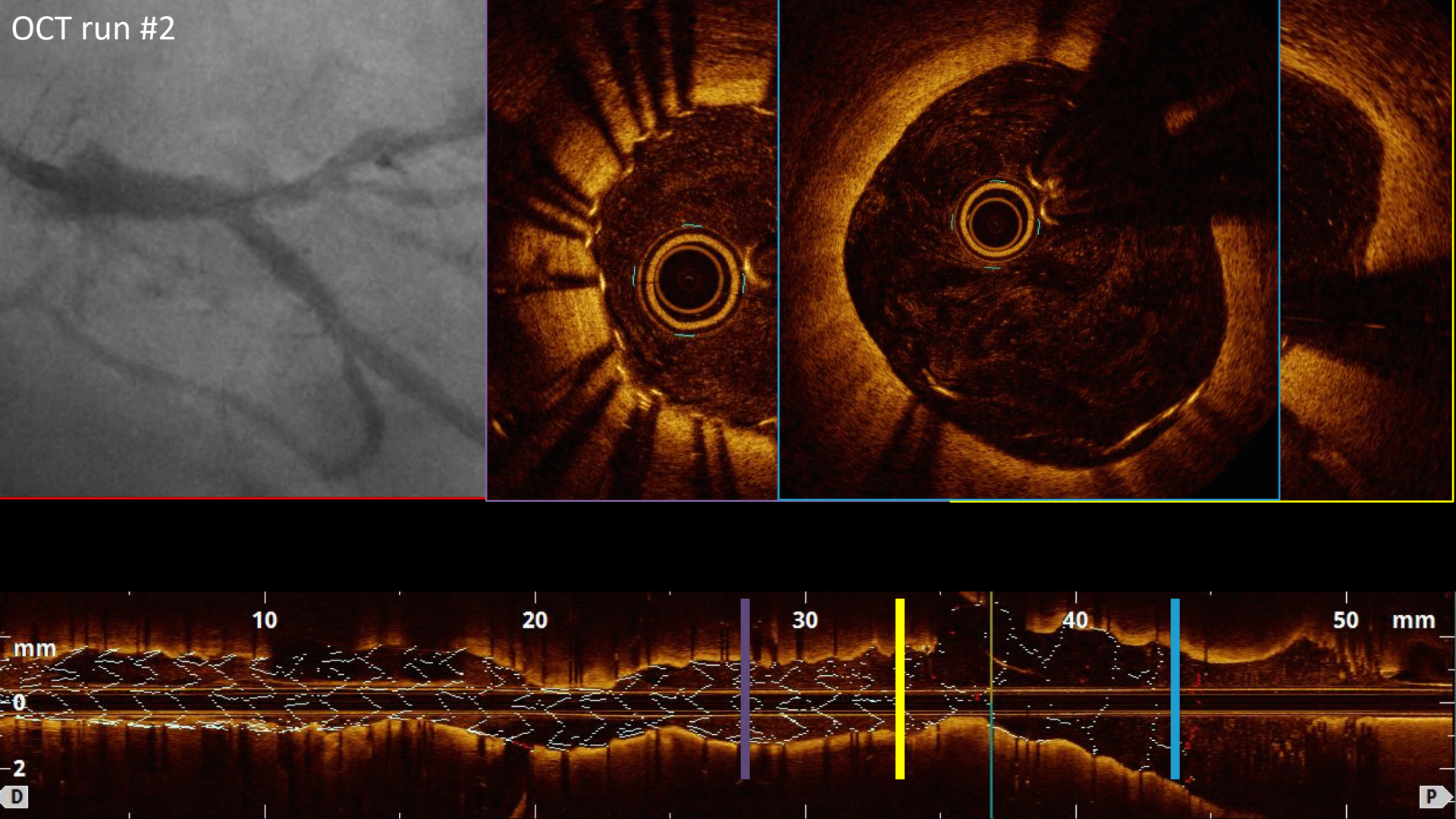


- Medina 1-0-1 LM/ Cx + OM1 stenoses
- OM1 PCI with EES 2.75 x 23 mm implantation


OCT run #1
B
EEL/EEL diameter: 3.0 mm
B
EEL/EEL diameter: 4.3 mm
10
20
30
40
50
mm
mm
0
2
D
P

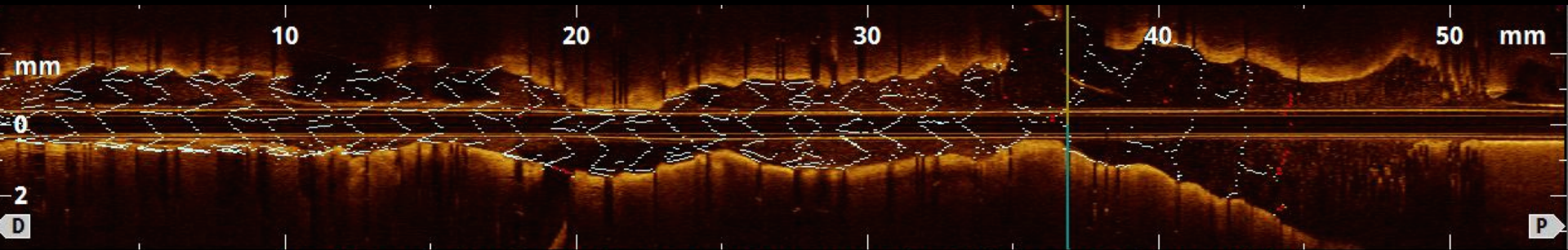


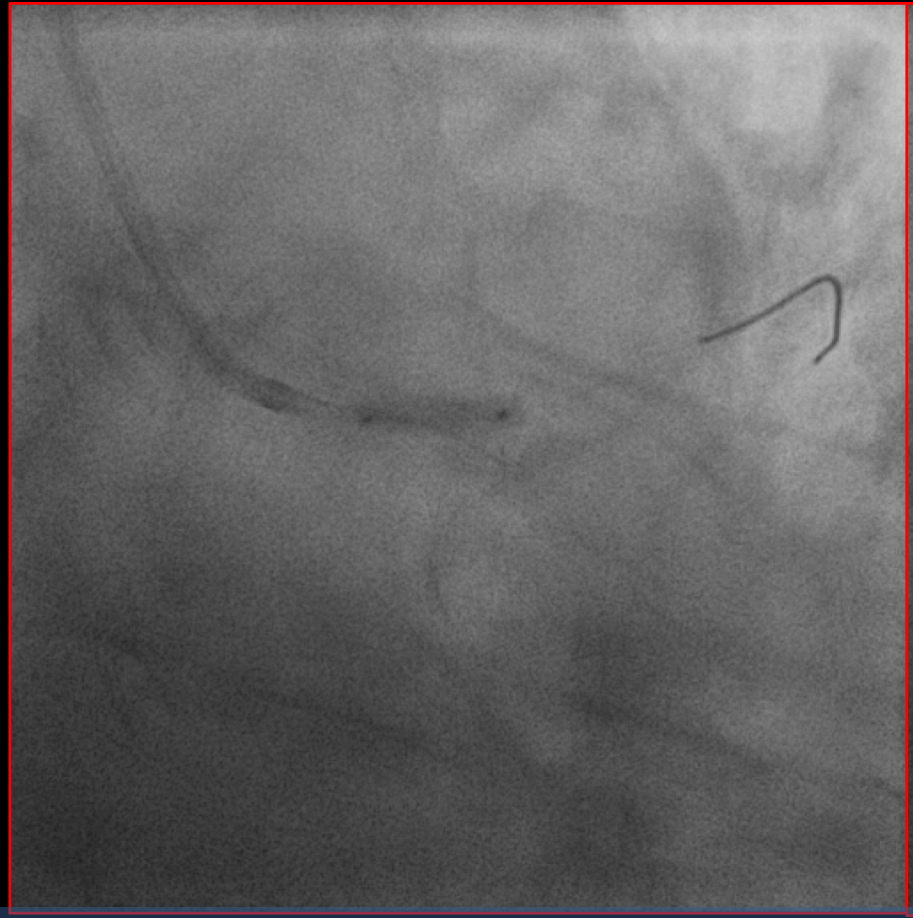
- Distal LM to Ost Cx PCI with EES 3.0 x 15 mm
- POT with NC balloon 4.5 x 6 mm (2 inflations) & wires exchange

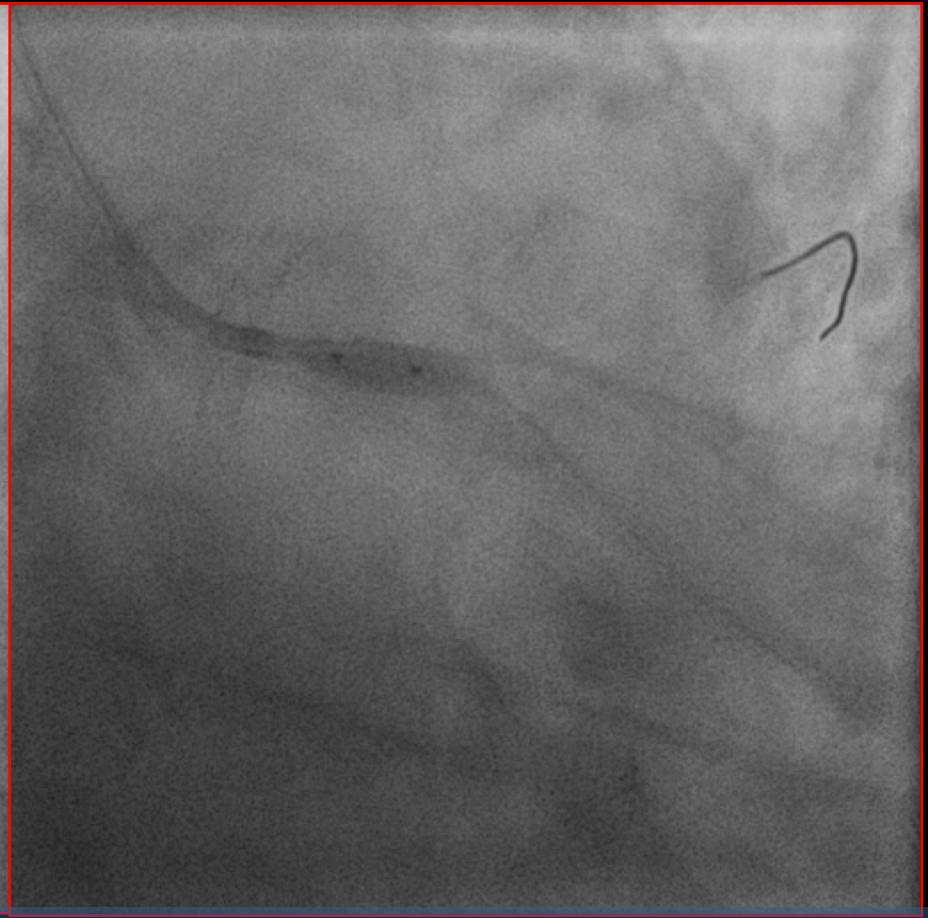

OCT run #2
10
20
30
40
50
mm
mm
0
2
D
P


OCT run #2

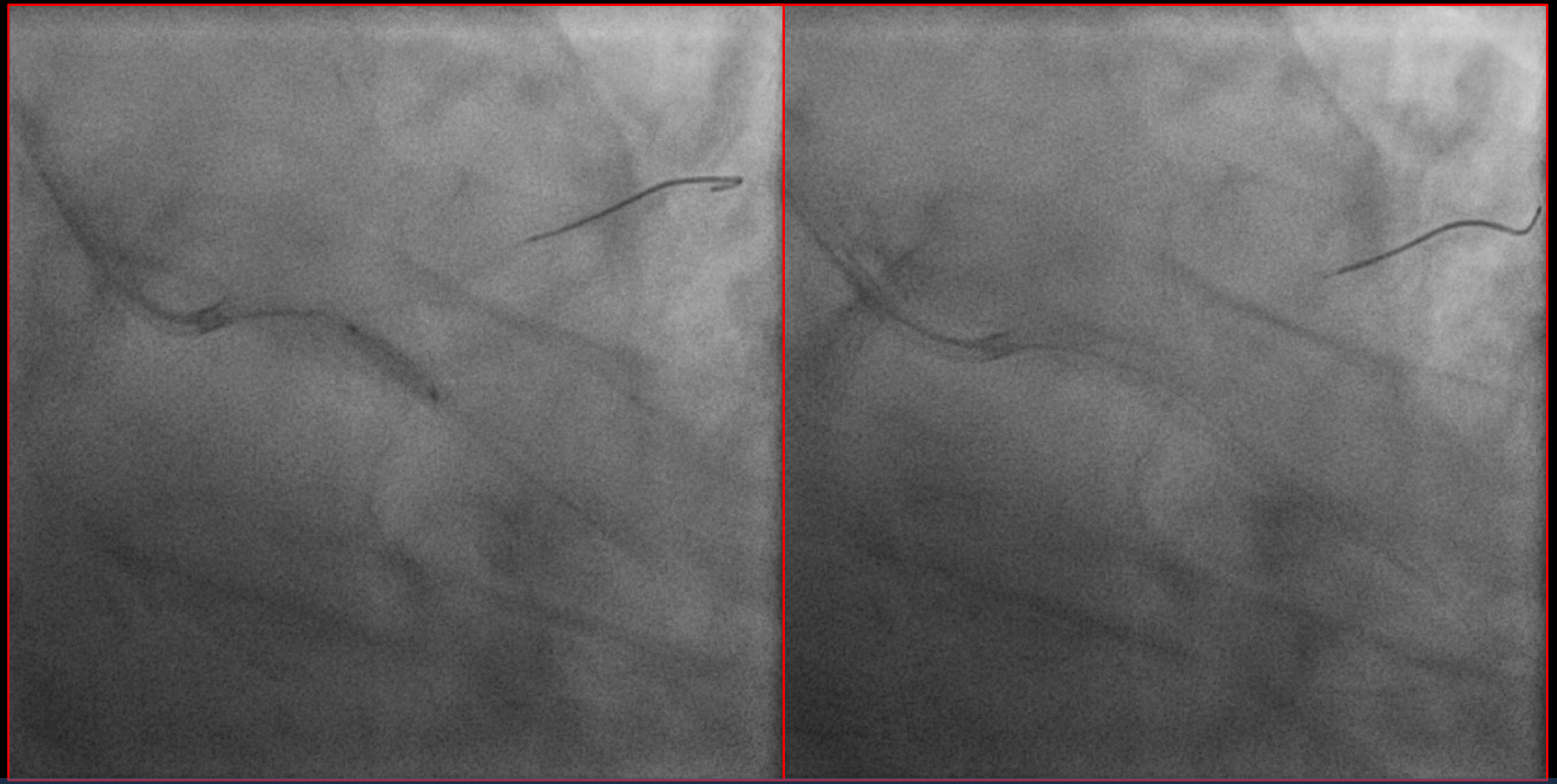

3D


10
20
30
40
50
mm
mm
0
2
D
P

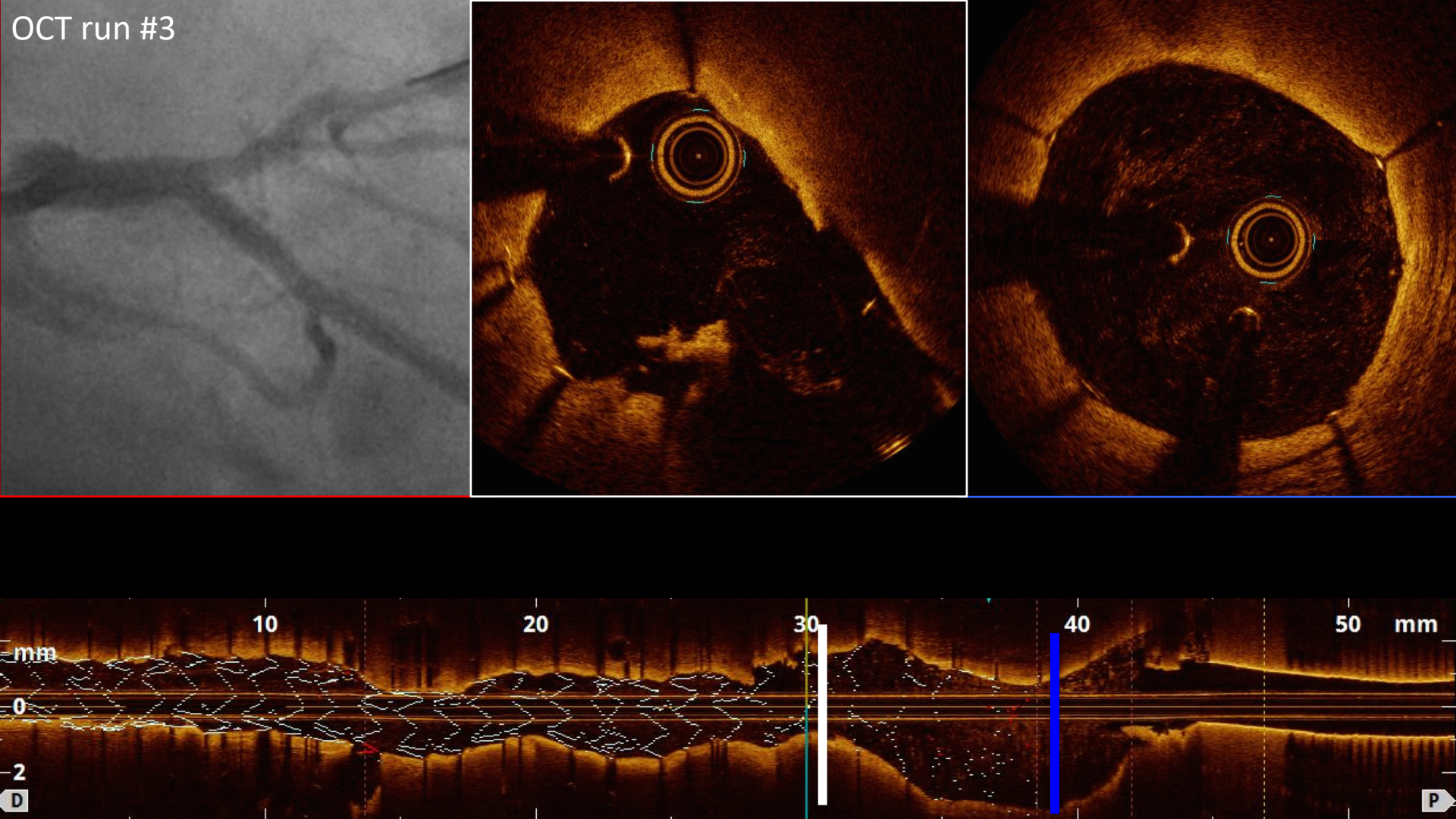


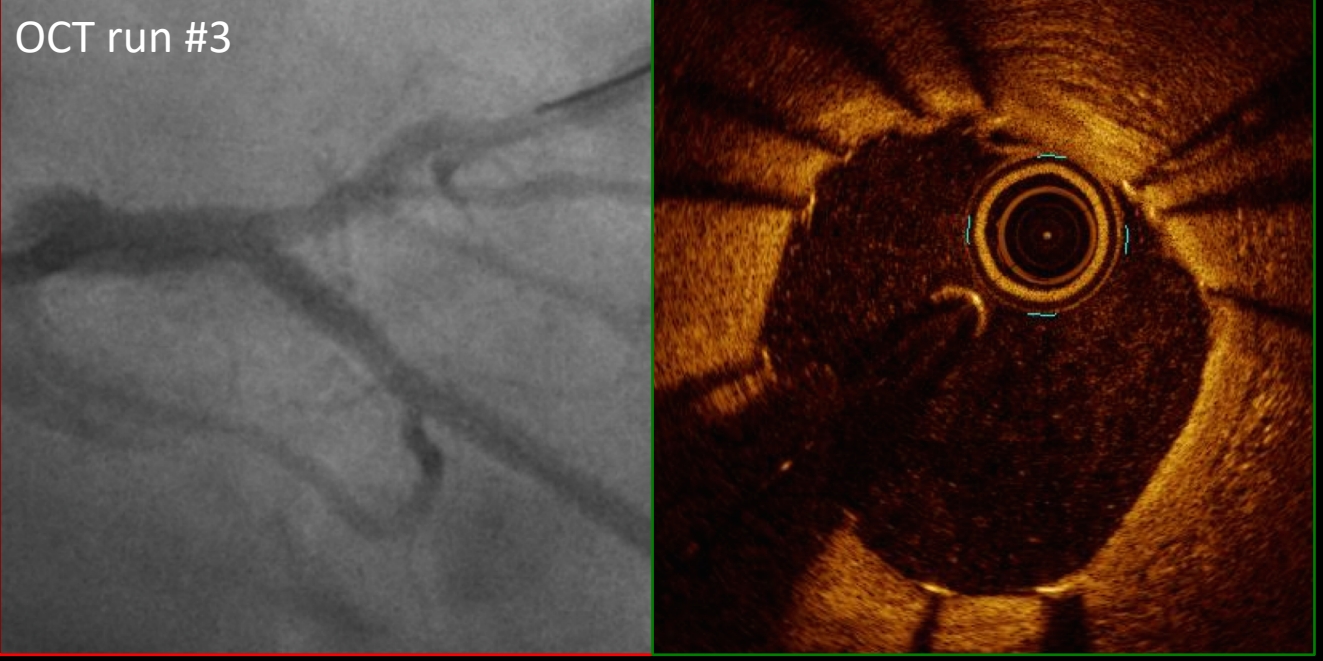


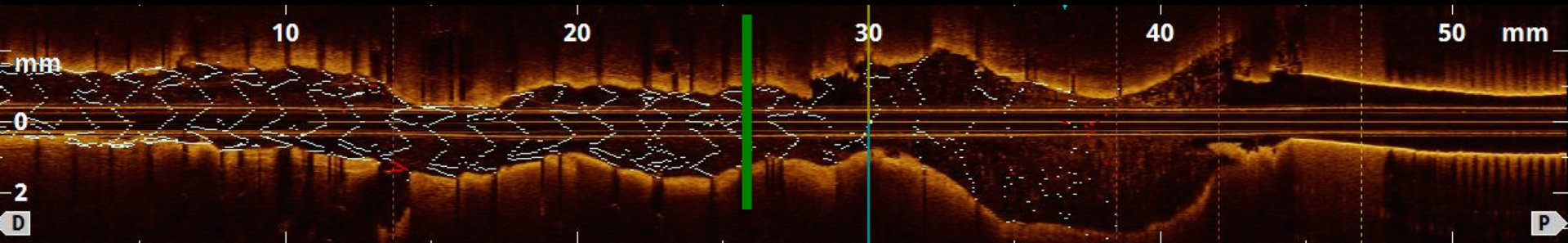
- Side dilatation towards LAD with NC balloon 3.0 x 12 mm
- RePOT with NC balloon 4.5 x 6 mm

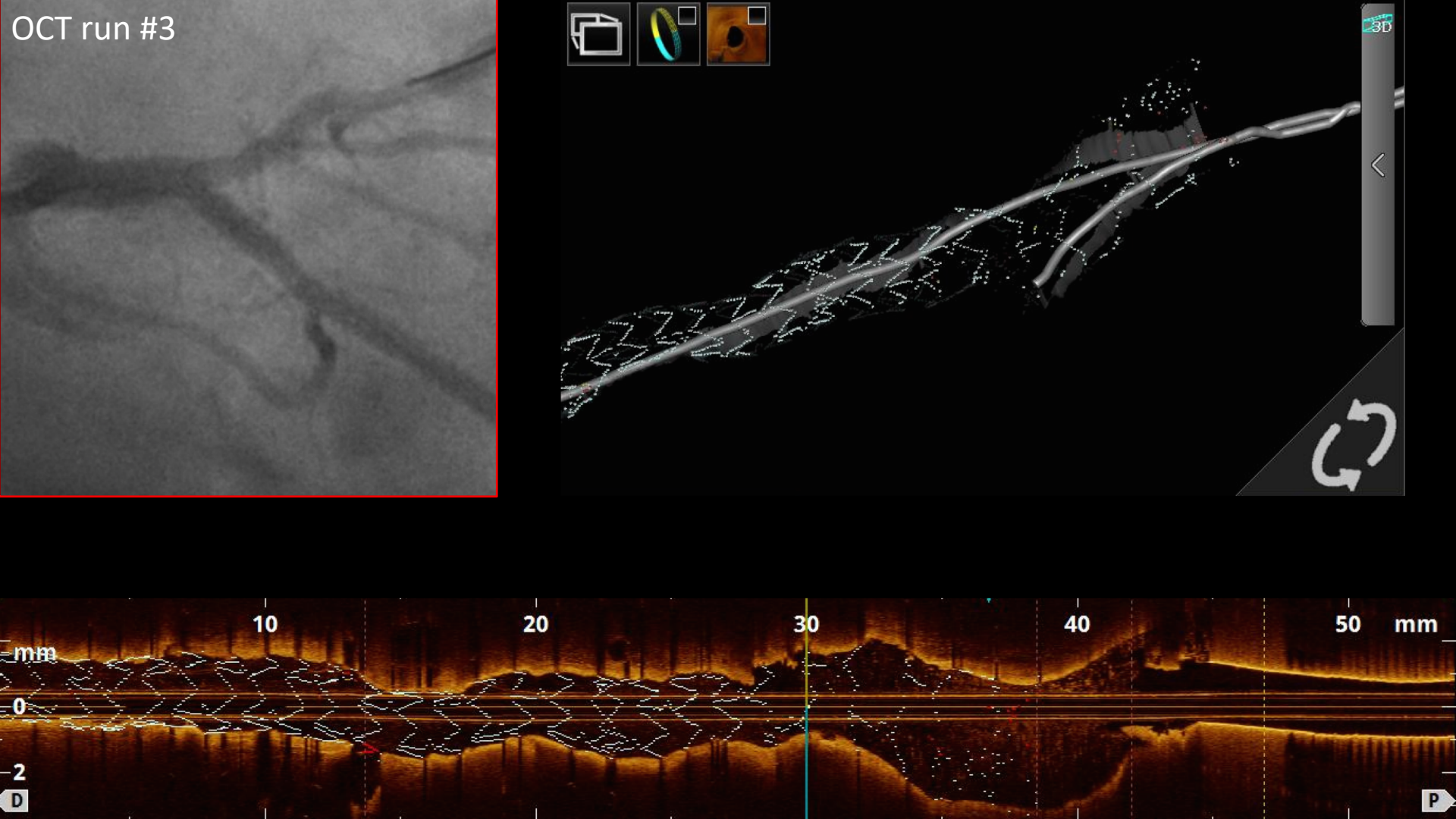


- Ostial Cx post dilation with NC balloon 3.0 x 12 mm
- Final result


OCT run #3
10
20
30
40
50
mm
mm
0
2
D
P


OCT run #3


10
20
30
40
50
mm
mm
0
2
D
P


OCT run #3
3D
10
20
30
40
50
mm
mm
0
2
D
P

LEMON

LEft Main Oct-guided iNterventions

- Prospective, multicentre study
- <u>Main objective:</u> To evaluate the feasibility of standardized OCT-guided LM PCI using XIENCE EES & 3D OCT protocols
- <u>Secondary objectives:</u> To evaluate the safety & efficiency of standardized OCT-guided LM PCI

Left Main OCT-guided PCI

- LM OCT-guided PCI is feasible and appears to be an attractive option to optimize results.
- Ostial LM disease is currently a limitation of OCT analysis
- OCT-guided PCI is more sensitive than IVUS to detect early abnormalities.
- This option has to be evaluated in future clinical studies.

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