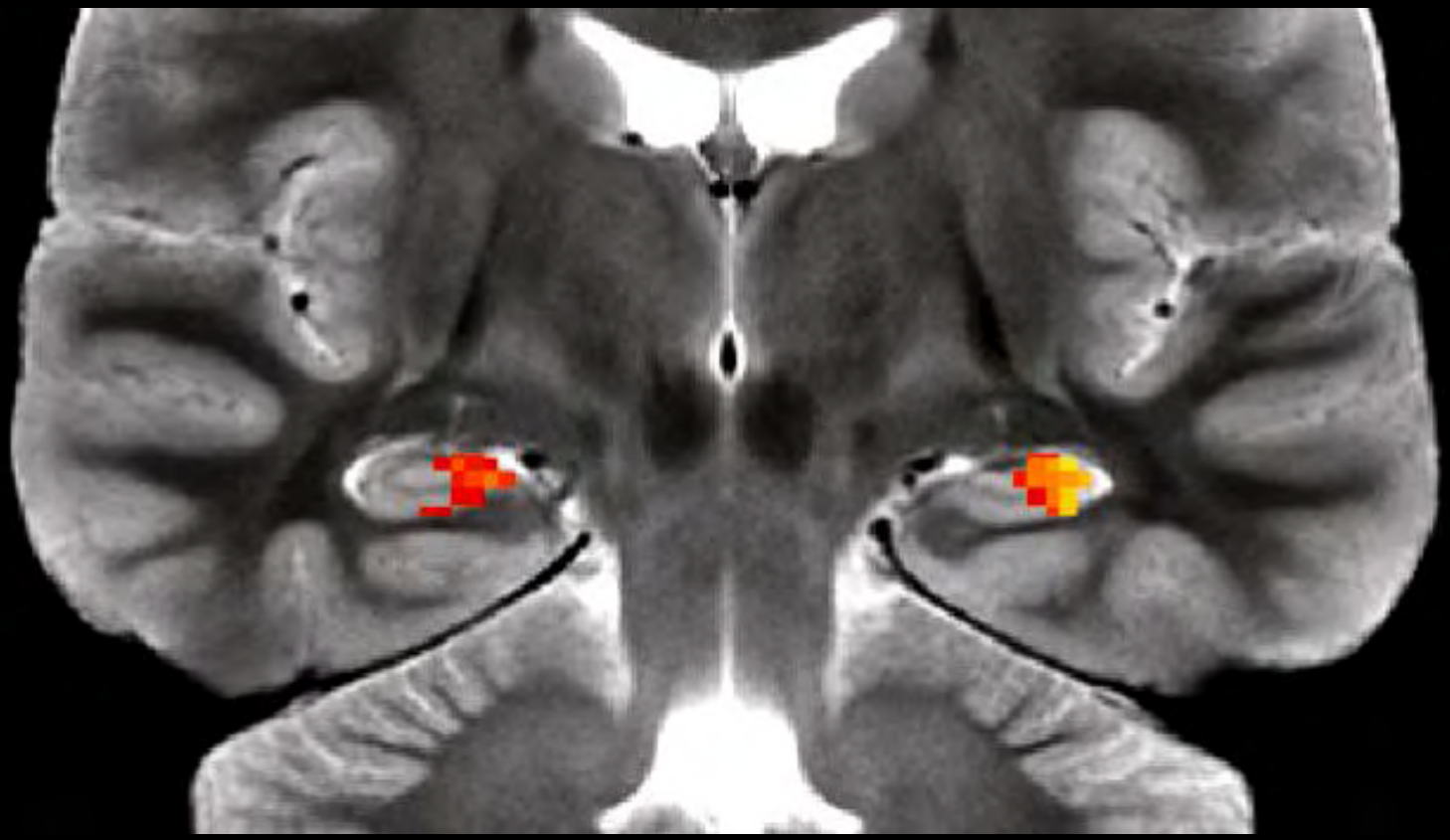
TCTAP

April 2013

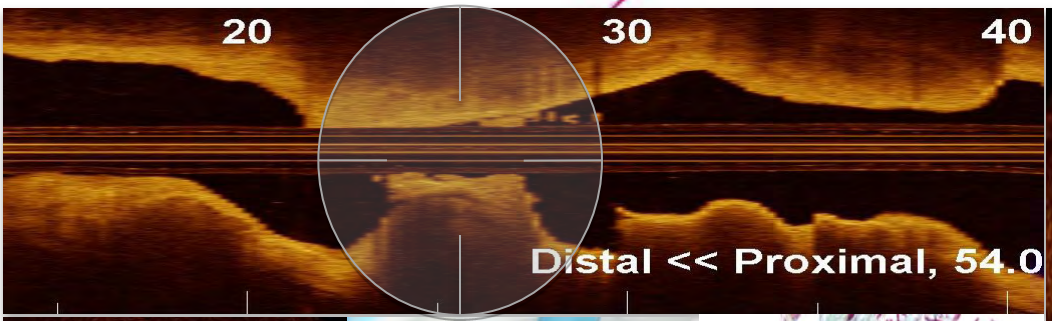


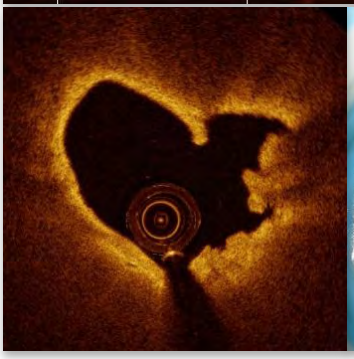
Acute MI: New Practical Insigths from OCT

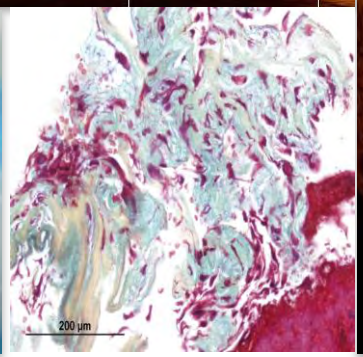
Giulio Guaglimi, MD

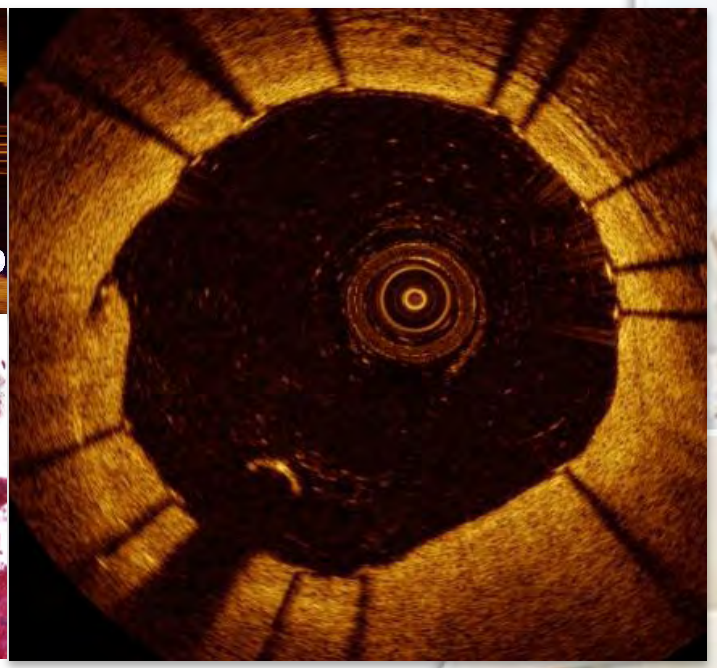
OCTAVIA

RIGHT TO THE HEART







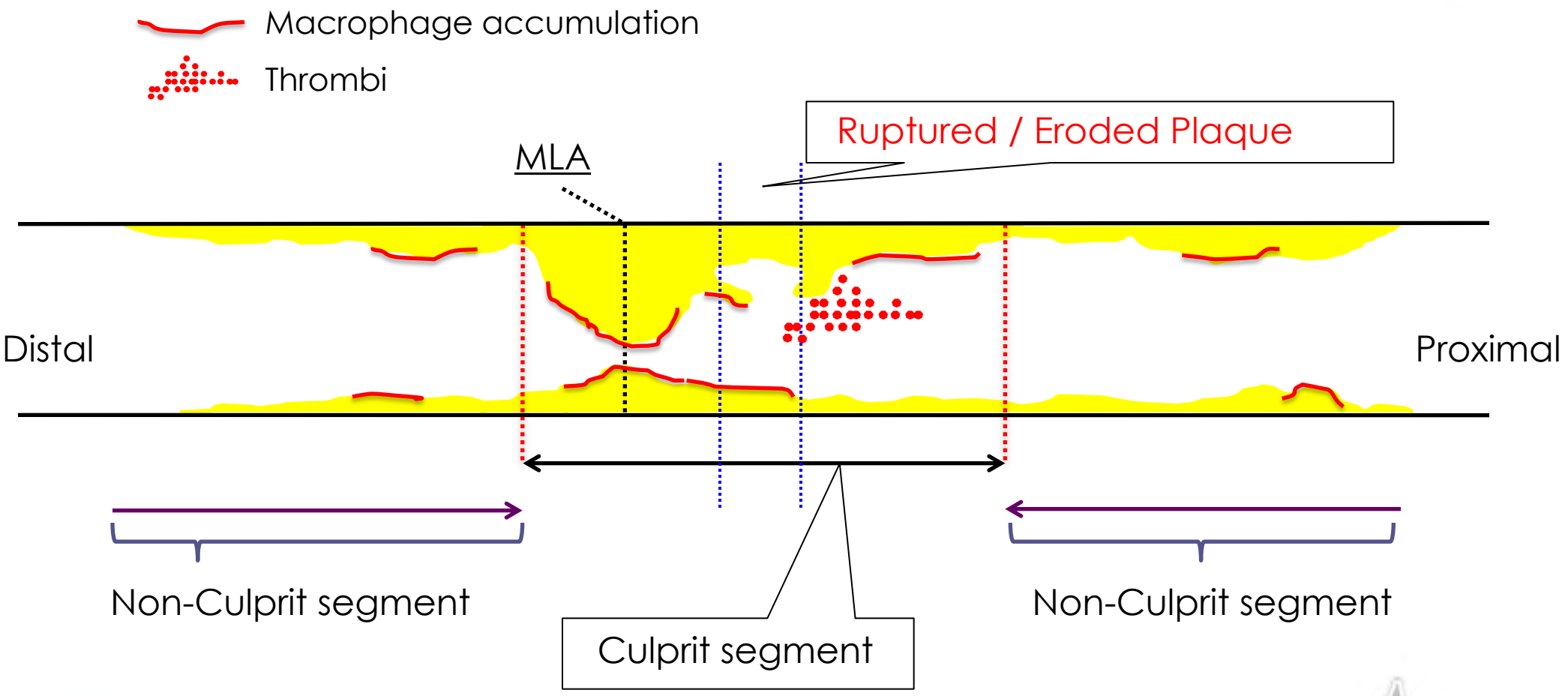


Optical **C**oherence **T**omography **A**ssessment of gender di**V**ersity in pr**i**mary **A**ngioplasty

gise Società Italiana di Cardiologia Invasiva

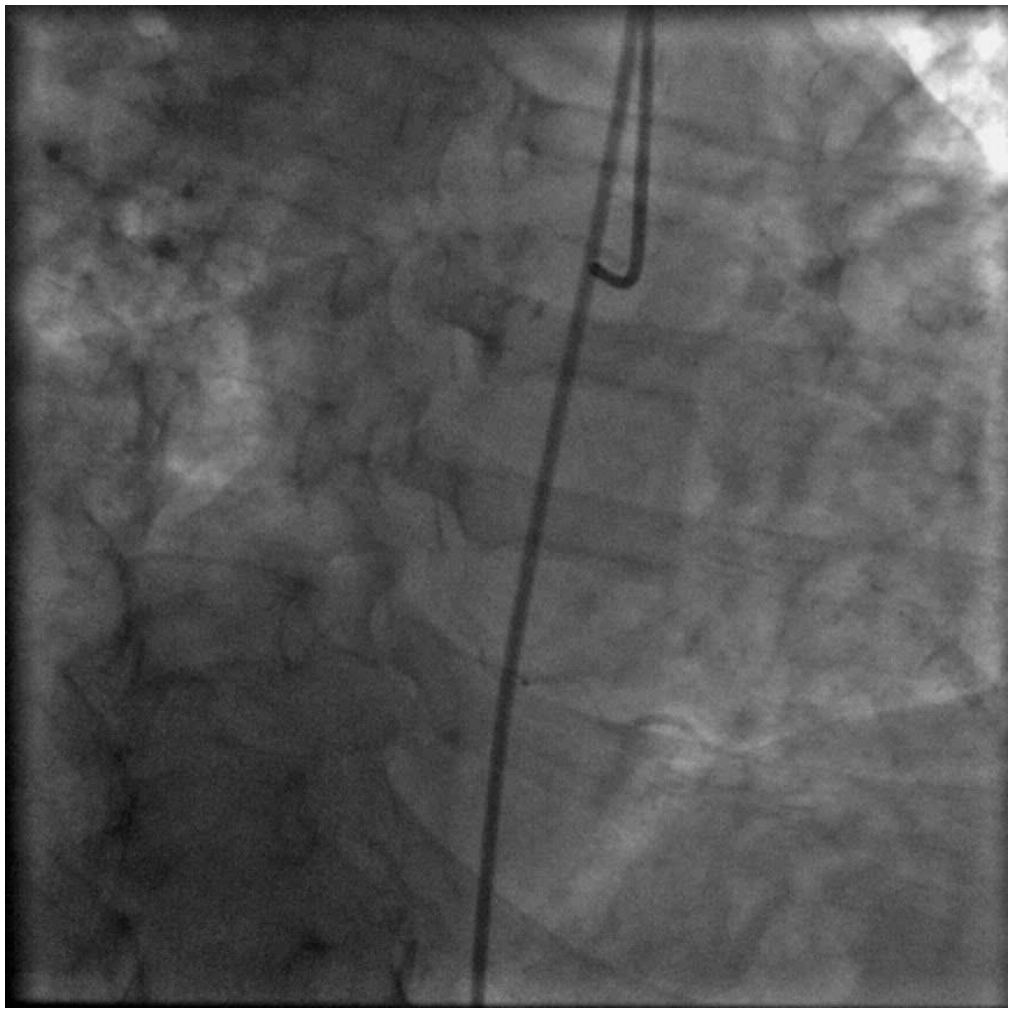
Segmental analysis in STEMI

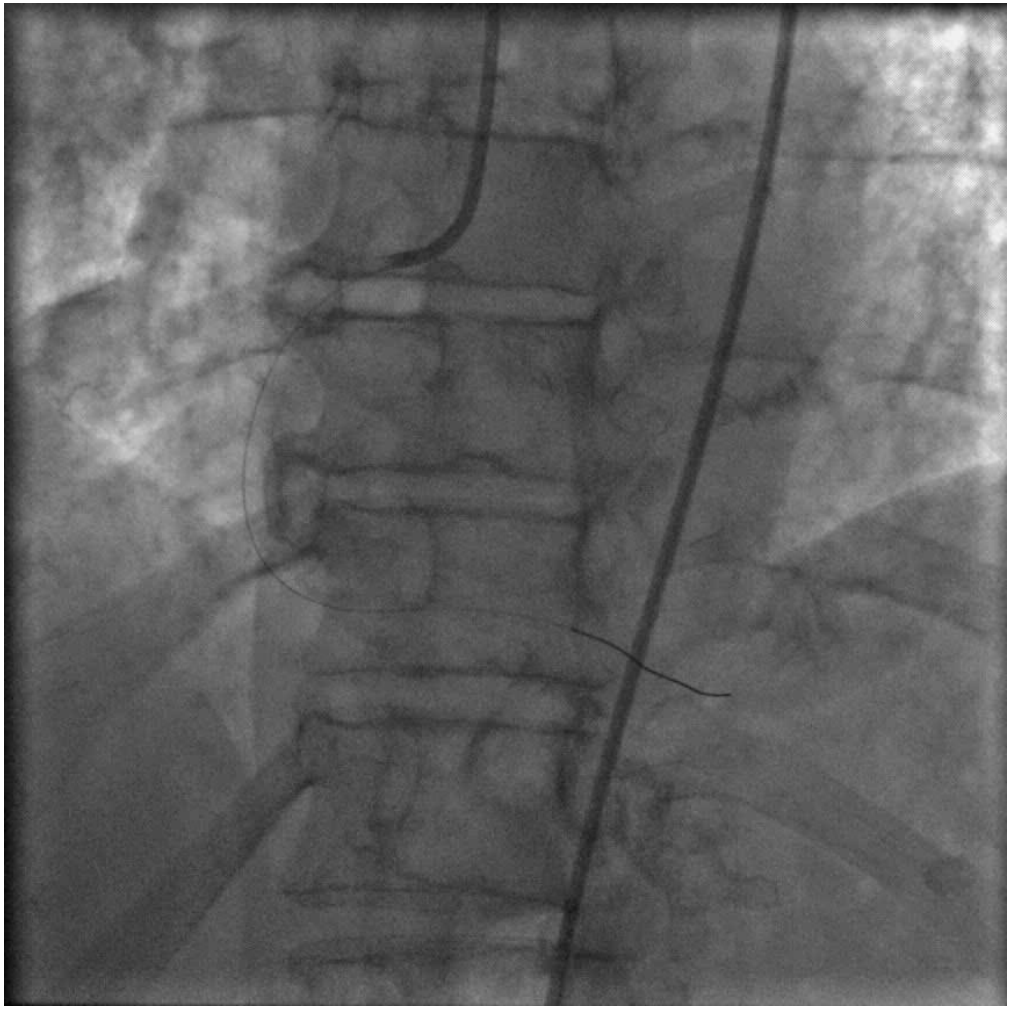
every 0.2-0.6-1.0 mm analysis (depending on target)



Try to gauge the extent of atherosclerosis by angiography is difficult

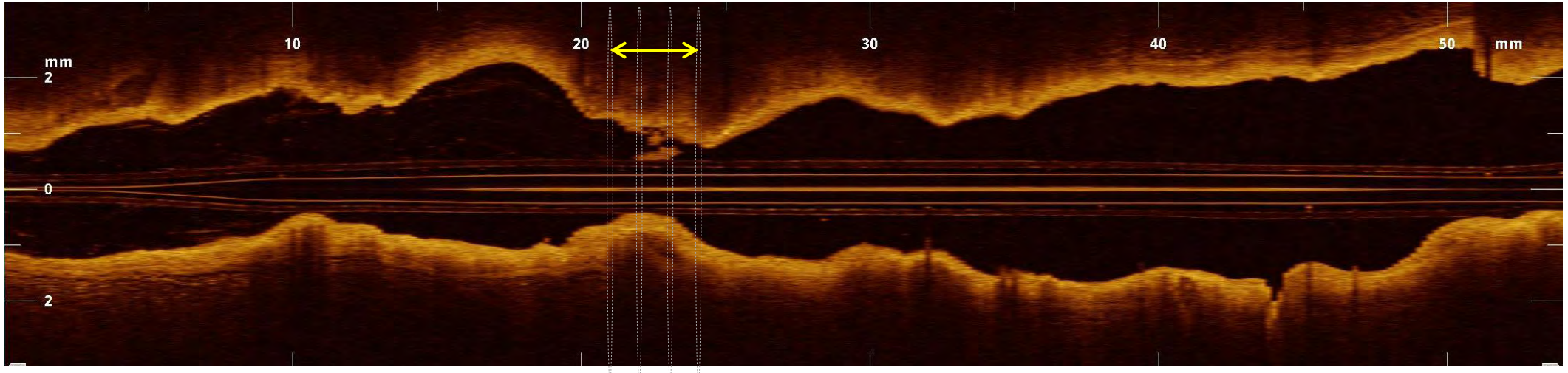
Inferior STEMI, 76 yrs



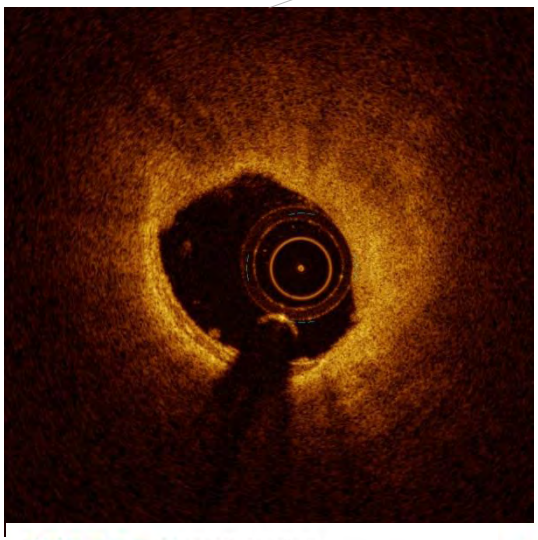


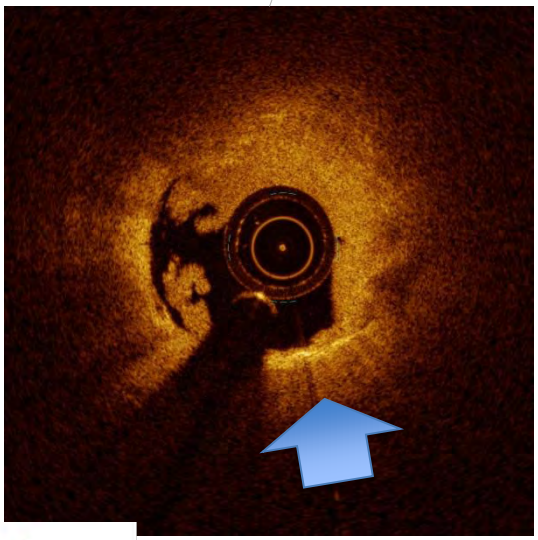
after thrombus aspiration

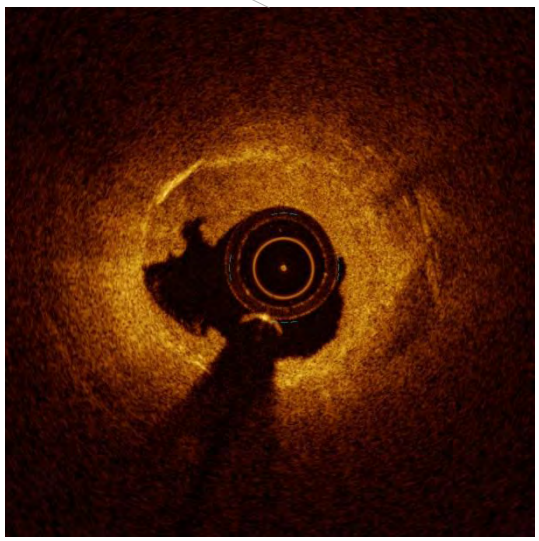
4 mm

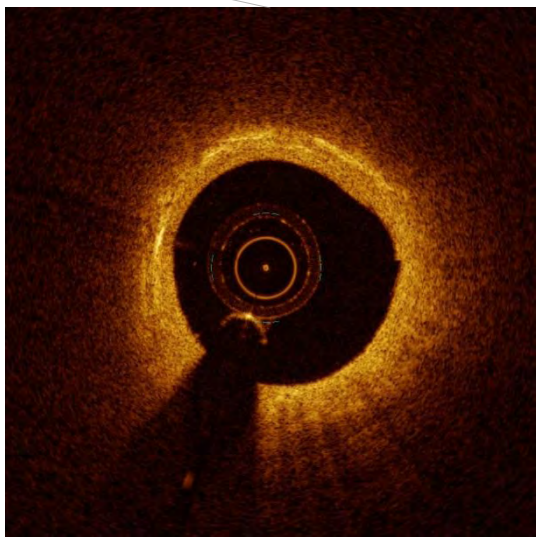


OCTAVIA

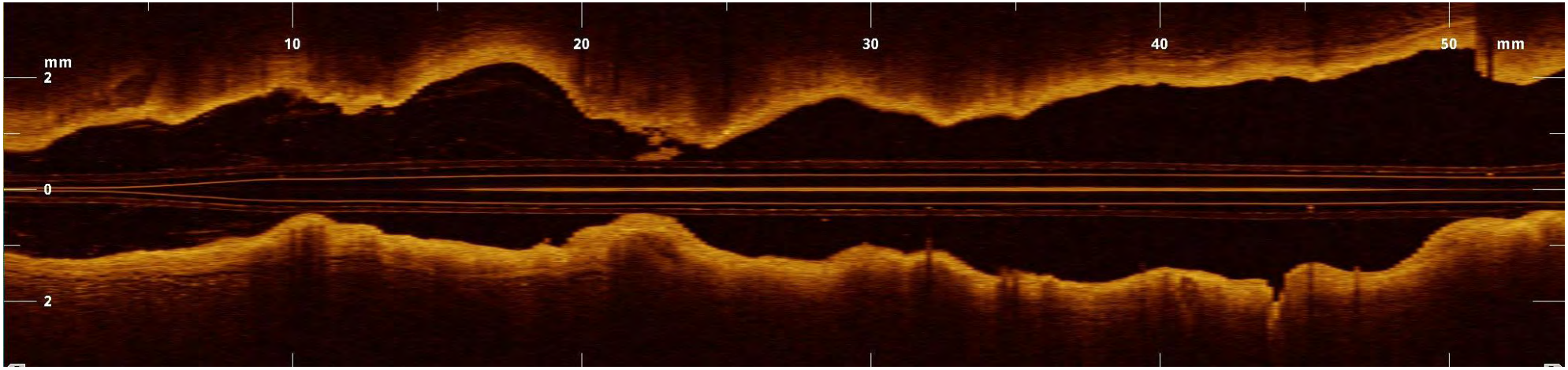


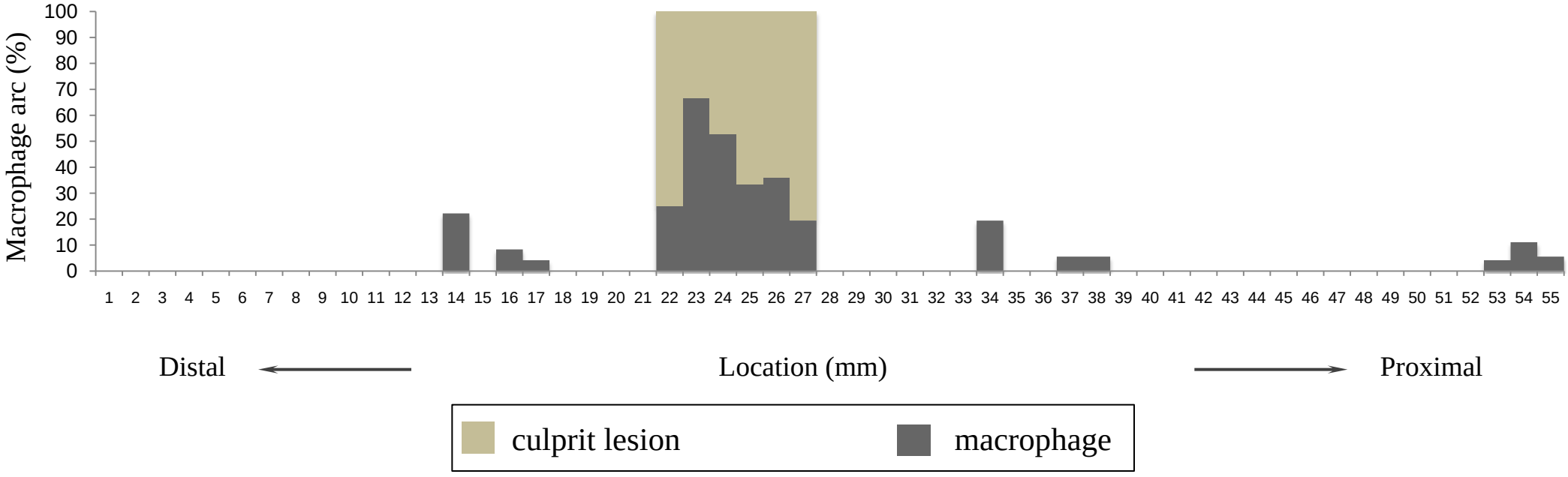




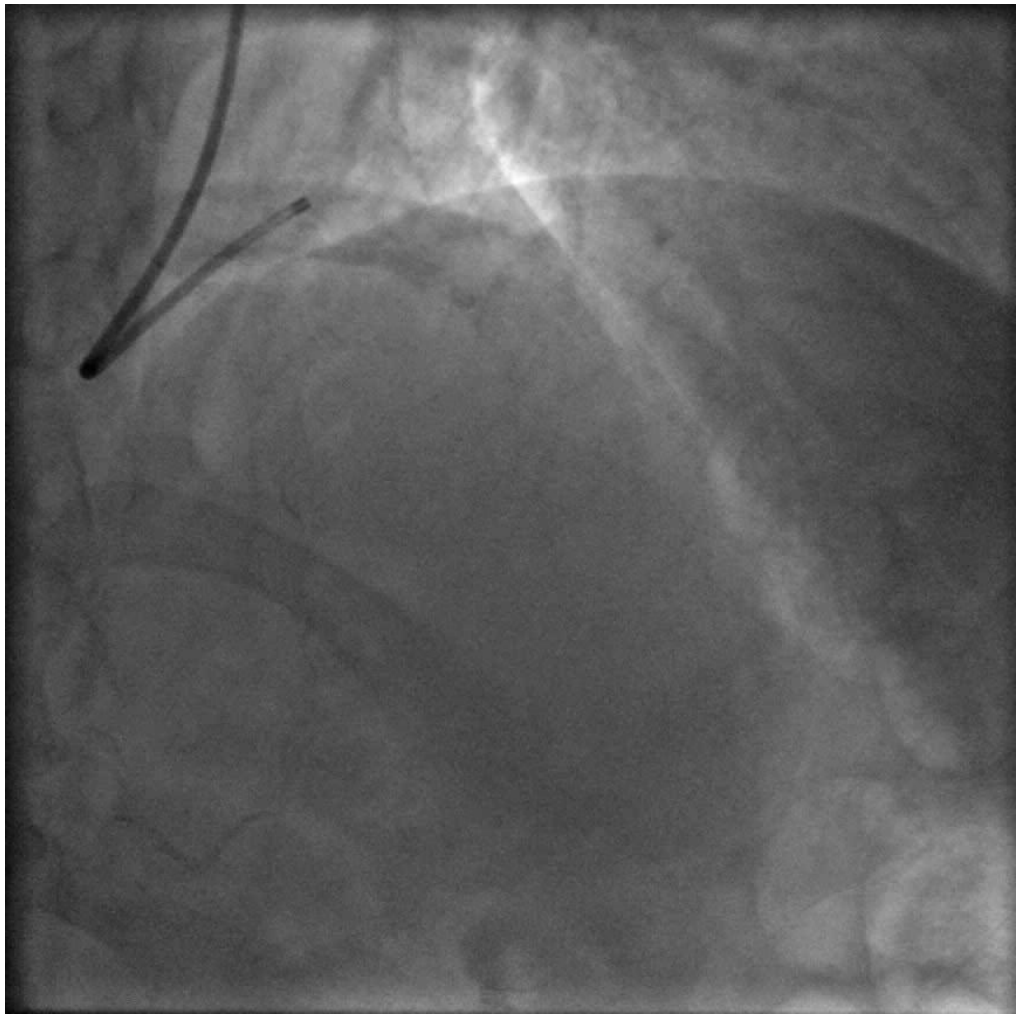


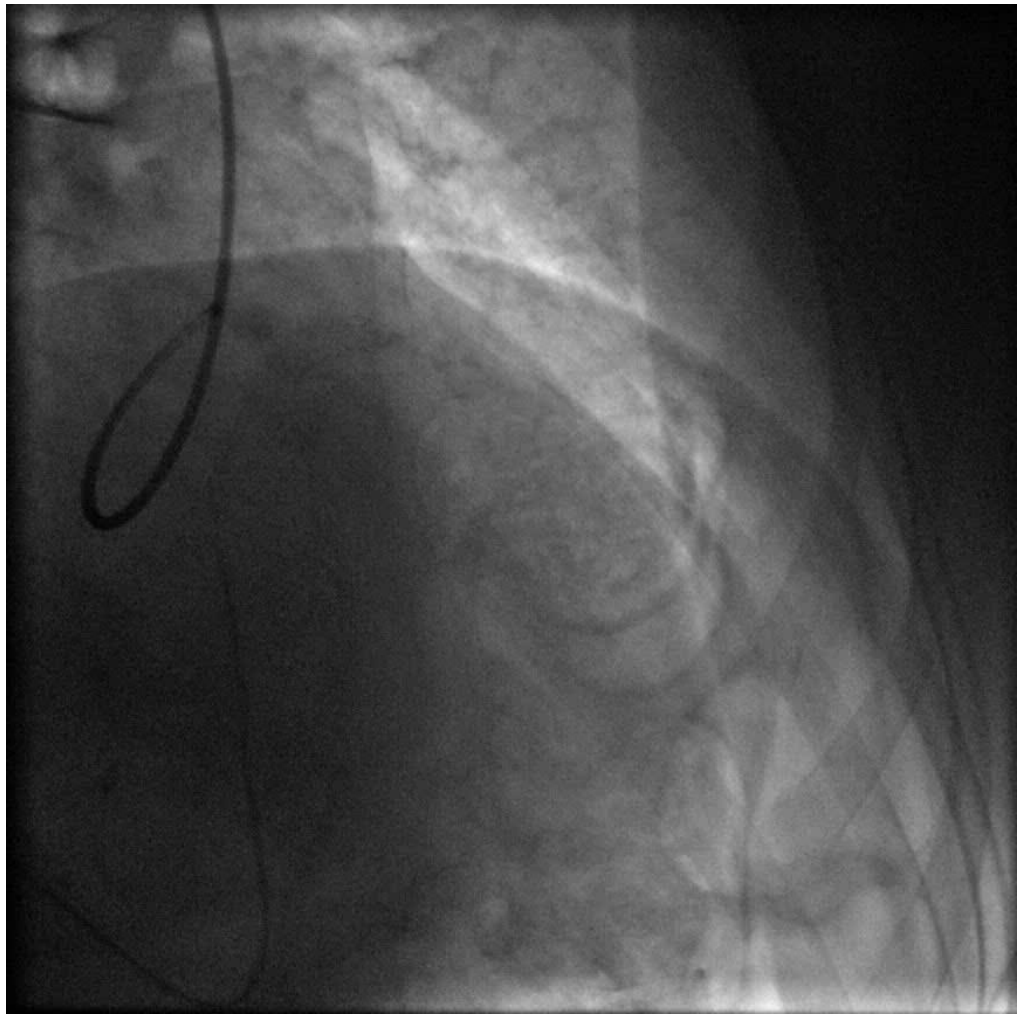
Focal plaque and focal extension of activated macrophages





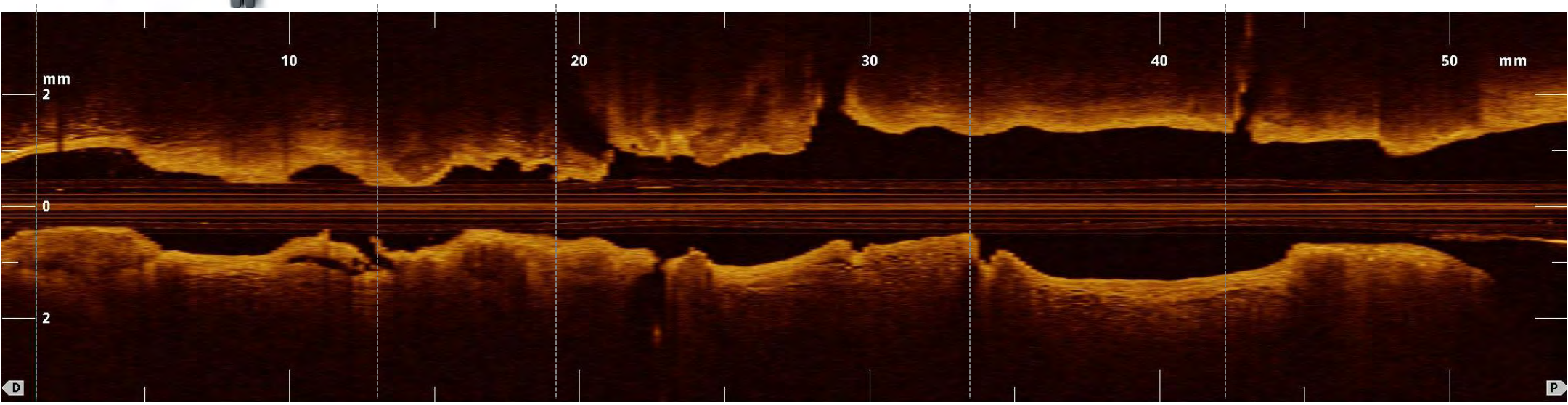
Anterior STEMI, 53 yrs

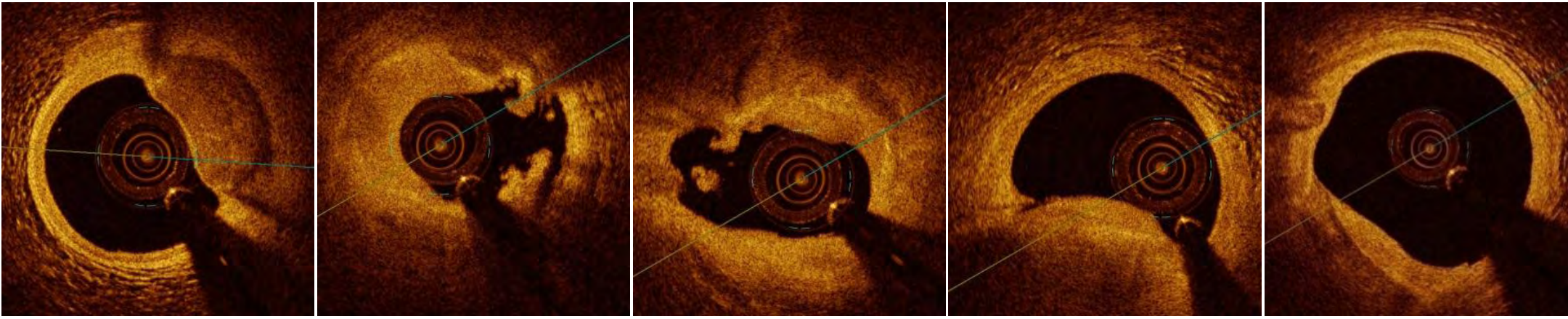




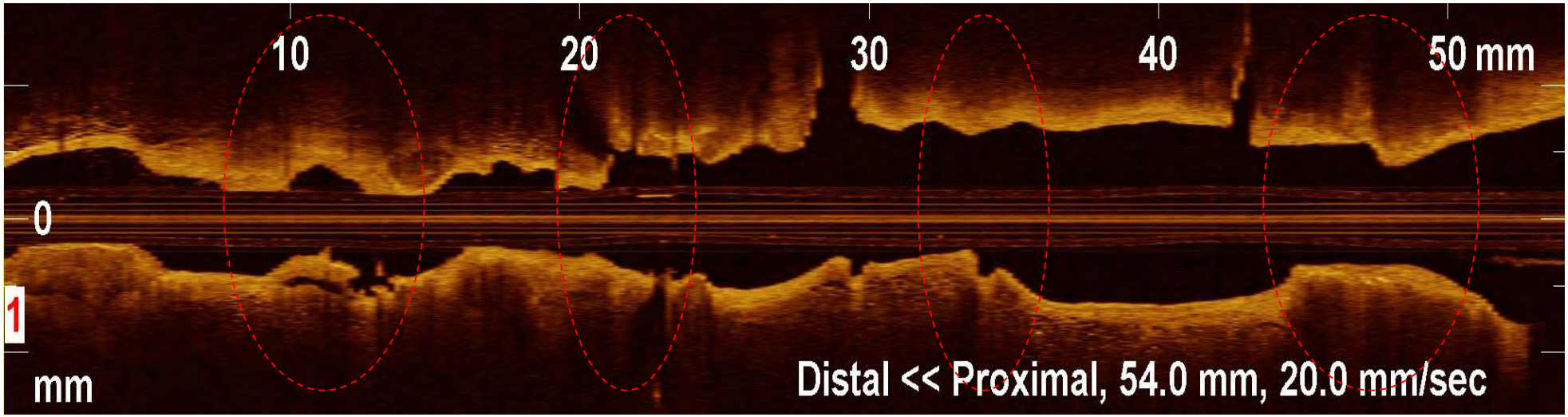
The risk of MACE is associated with the severity of disease at time of PCI

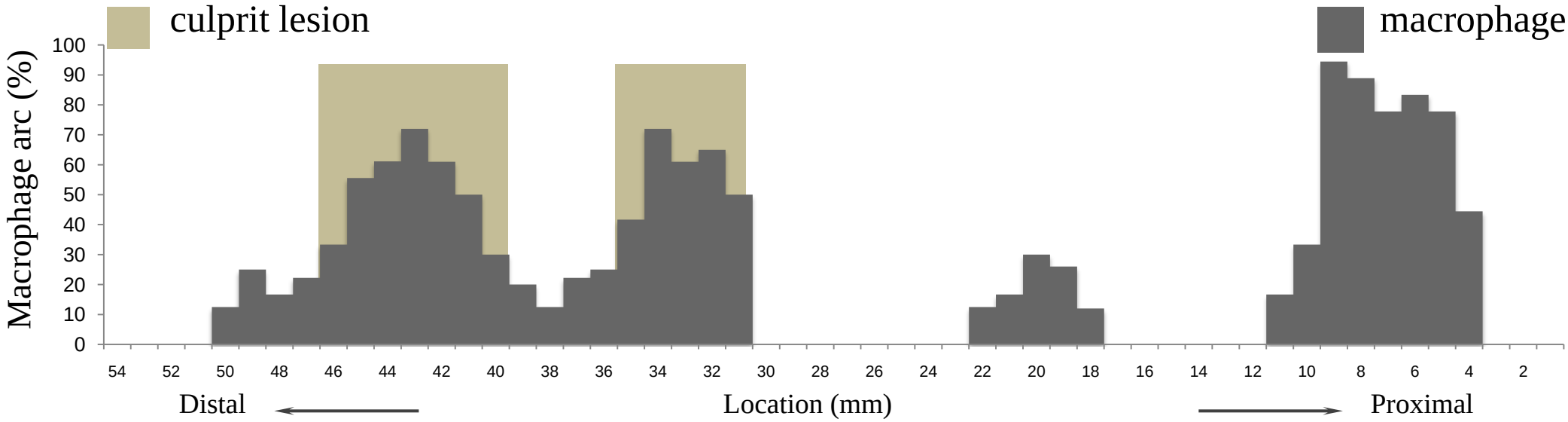
Less Plaque Burden in Young Women……





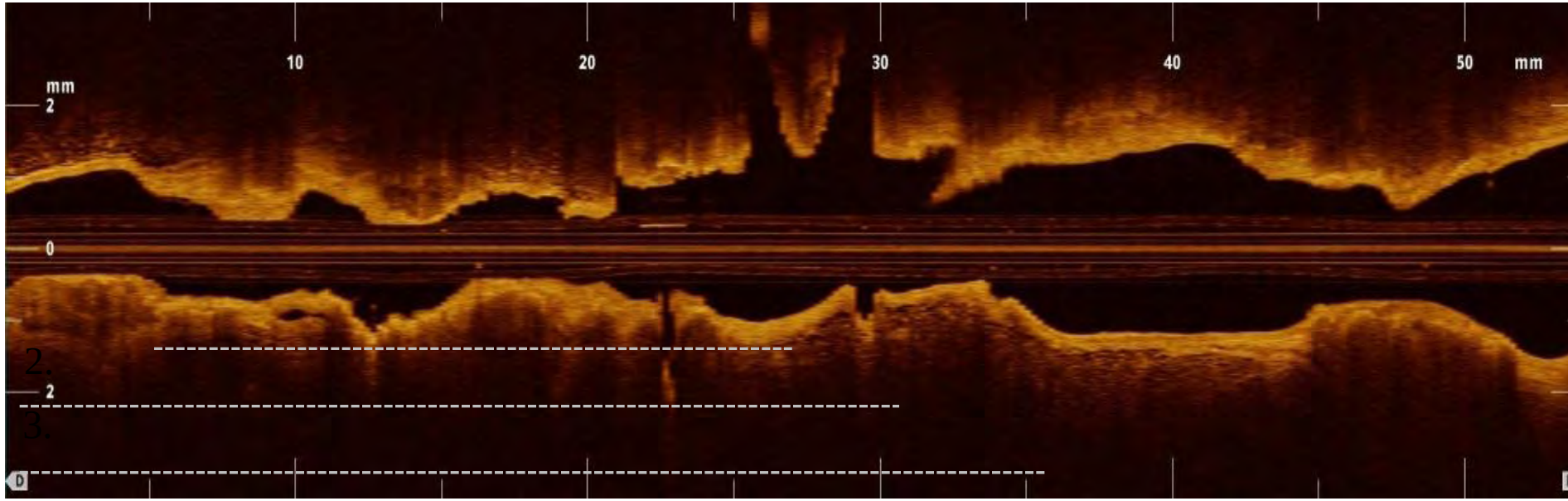
Diffuse disease and extension of macrophages

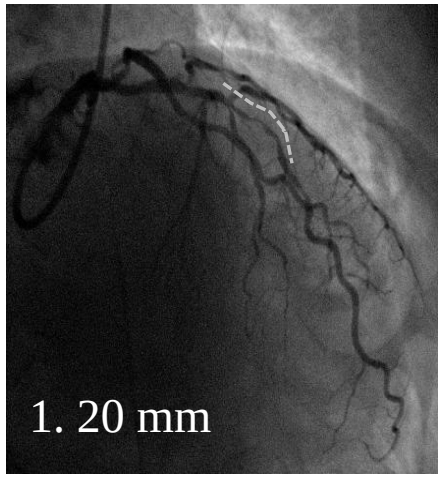


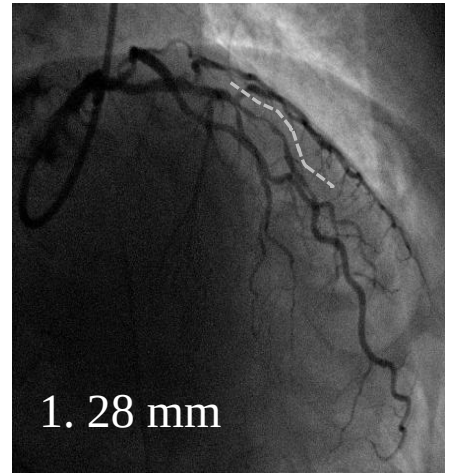


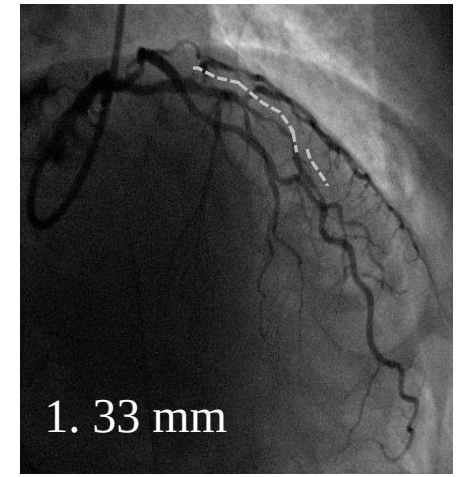
Macrophage arc = macrophage angle / 360 x 100 (%)

Stent length options

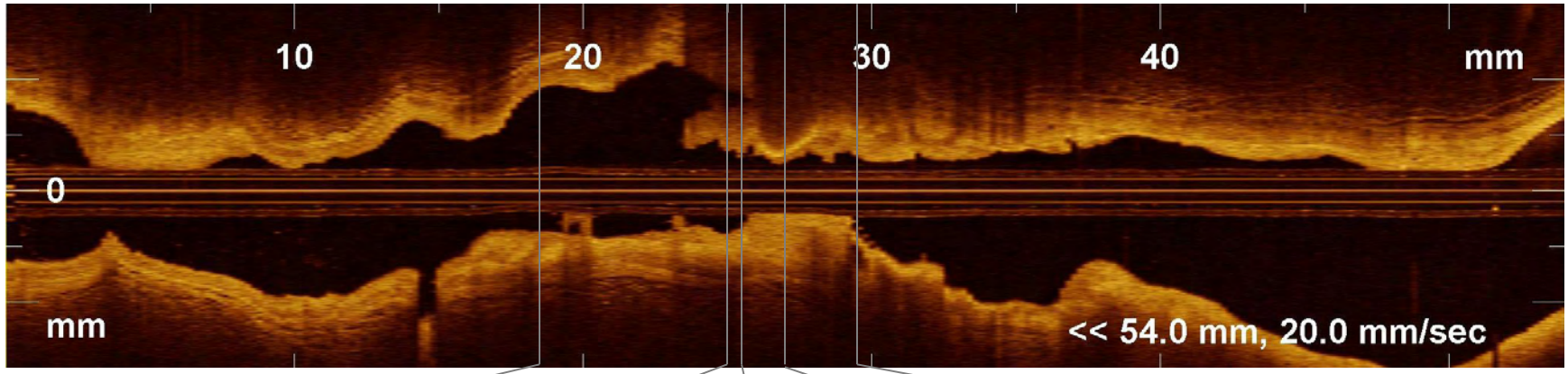


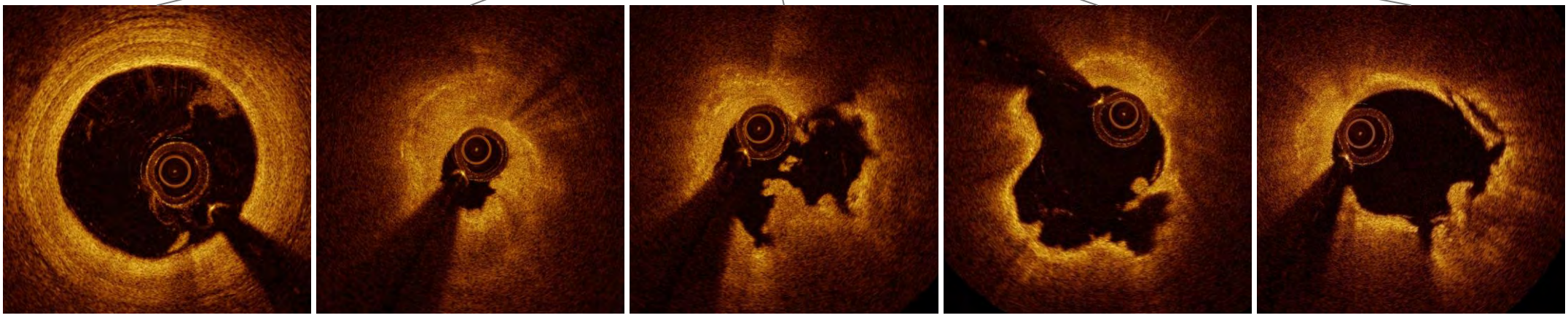






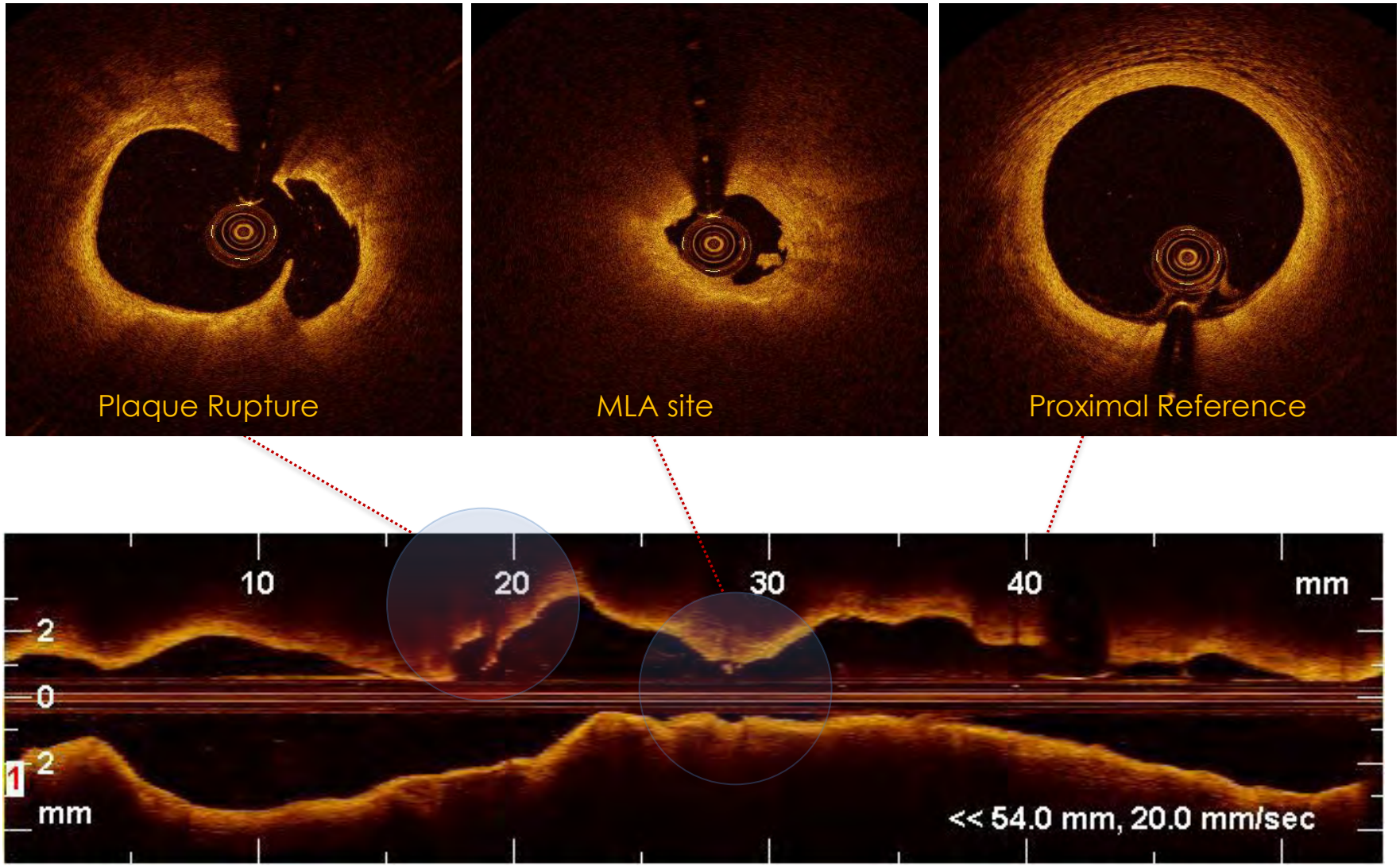
STEMI Following Thrombus Aspiration

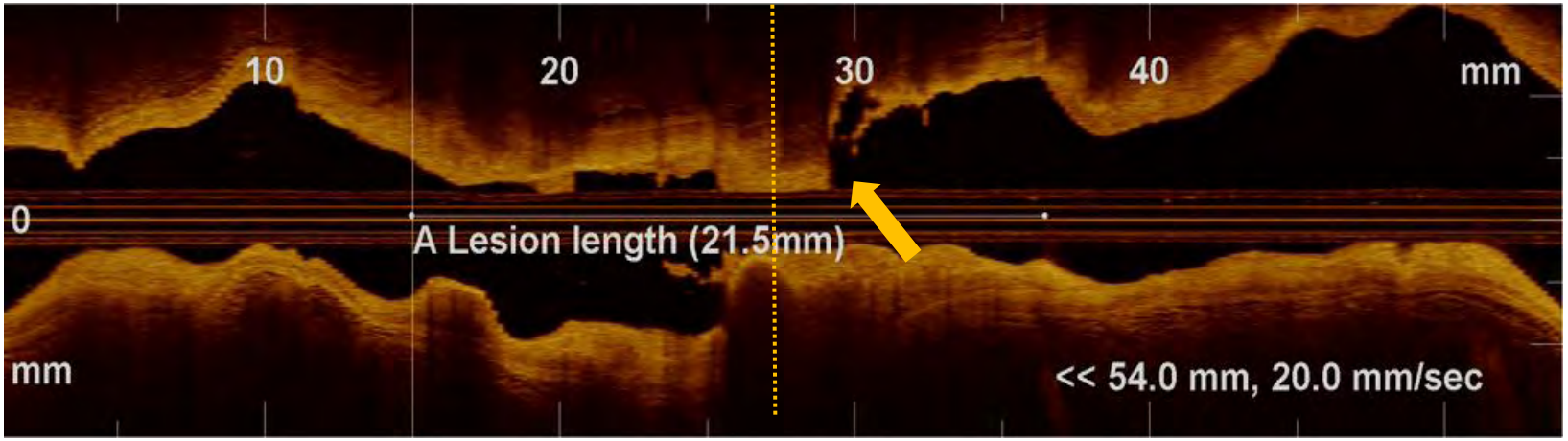


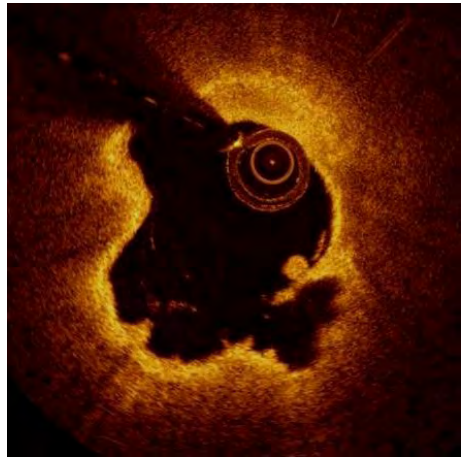


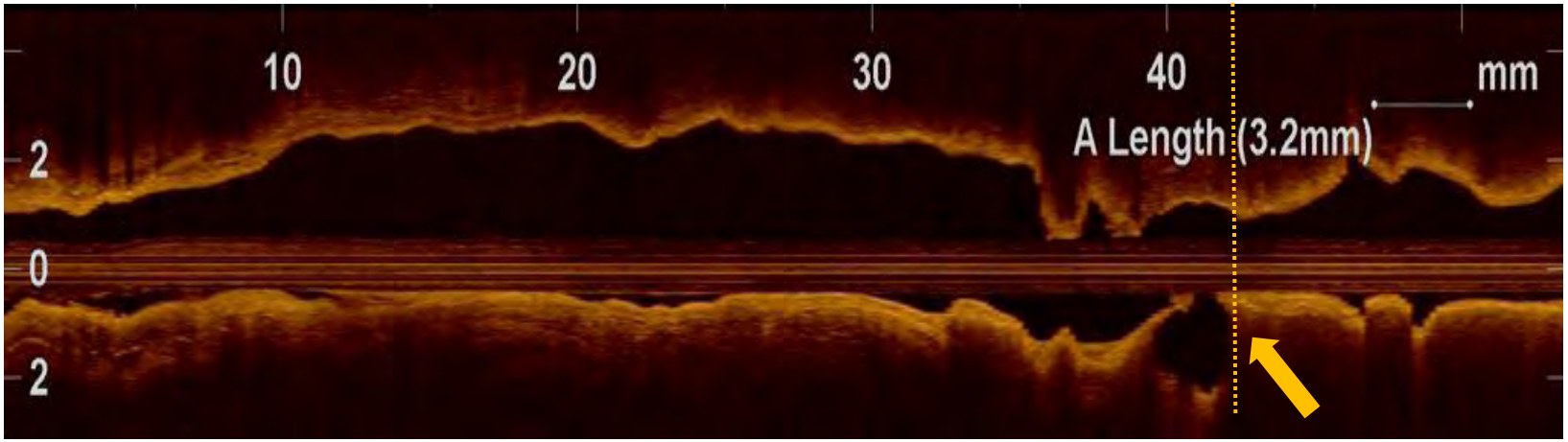
Position of MLA in relation to Plaque Rupture

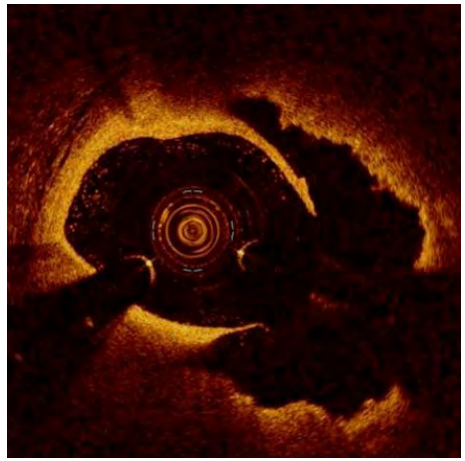
...not necessarily coincident: prox or distal

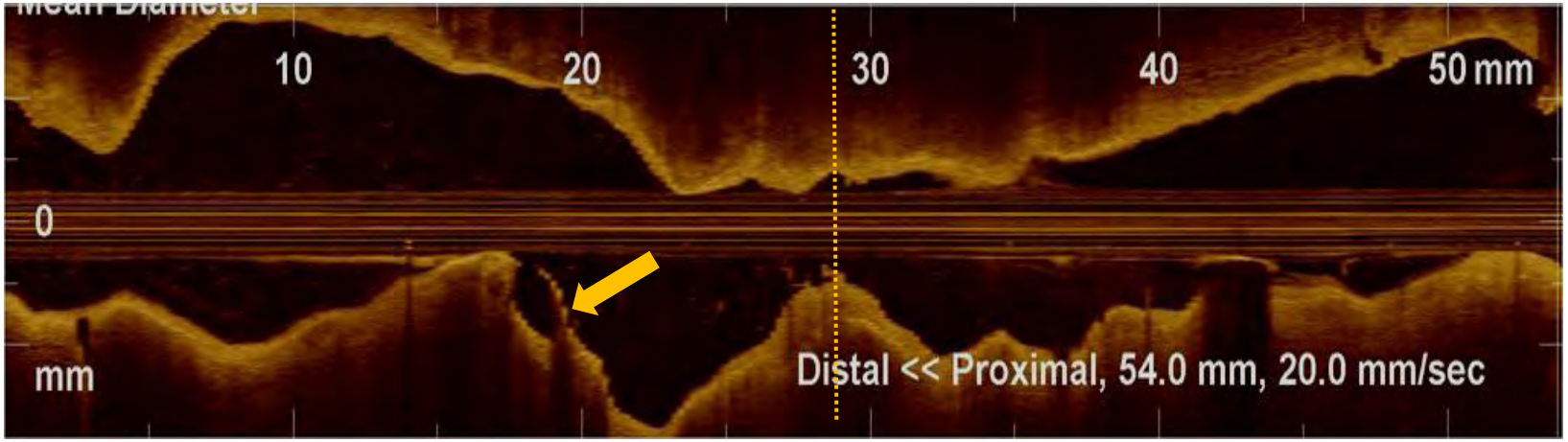


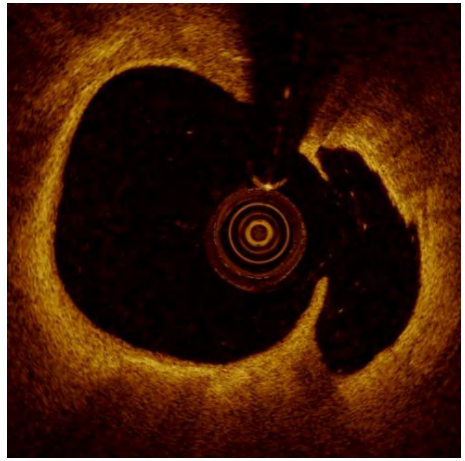

10
20
30
40
mm
0
A Lesion length (21.5mm)
mm
<< 54.0 mm, 20.0 mm/sec

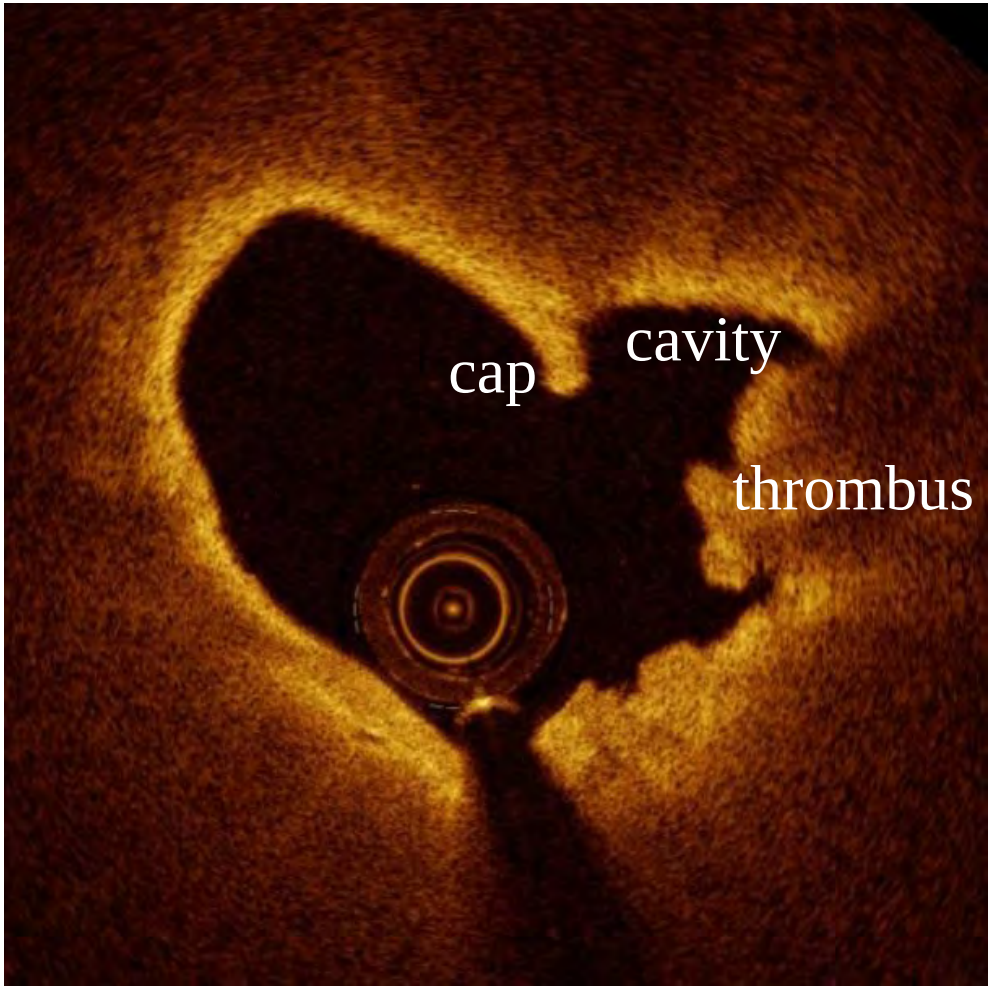



10
20
30
40
mm
A Length (3.2mm)
2
0
2

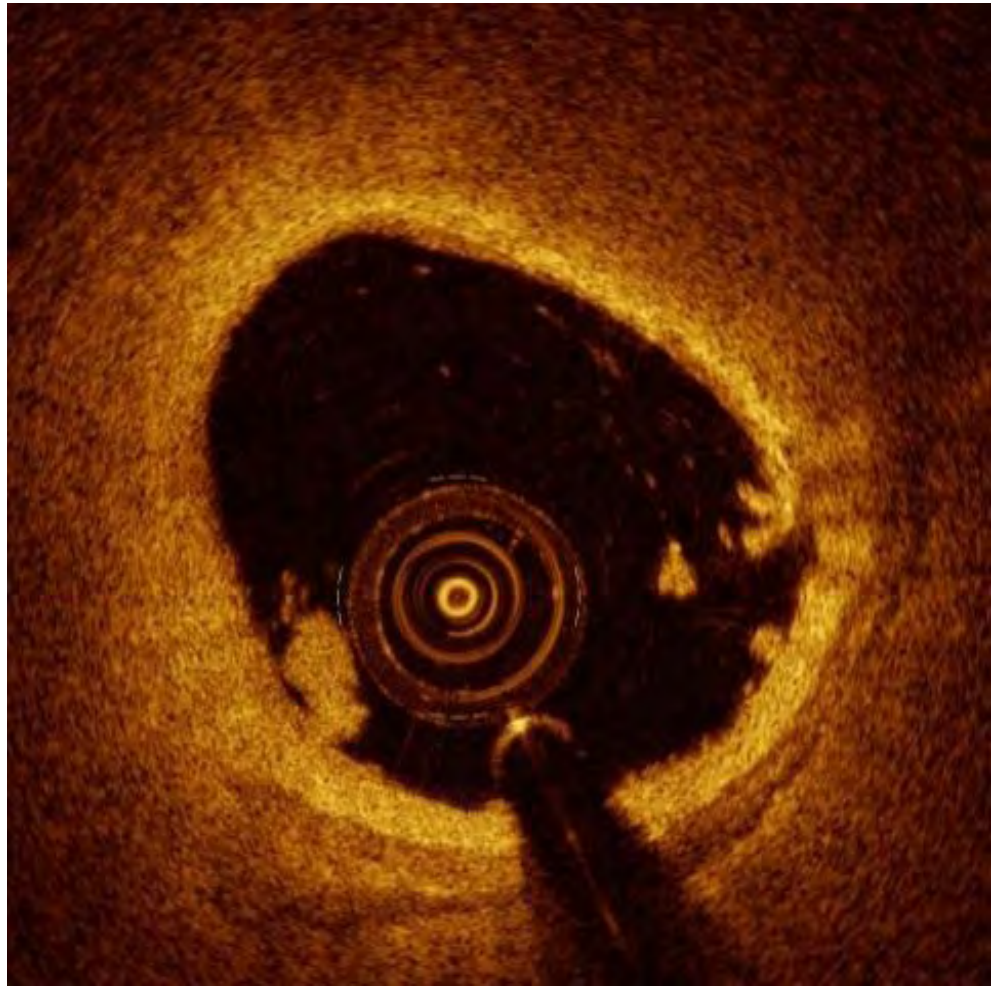



10
20
30
40
50 mm
0
mm
Distal << Proximal, 54.0 mm, 20.0 mm/sec





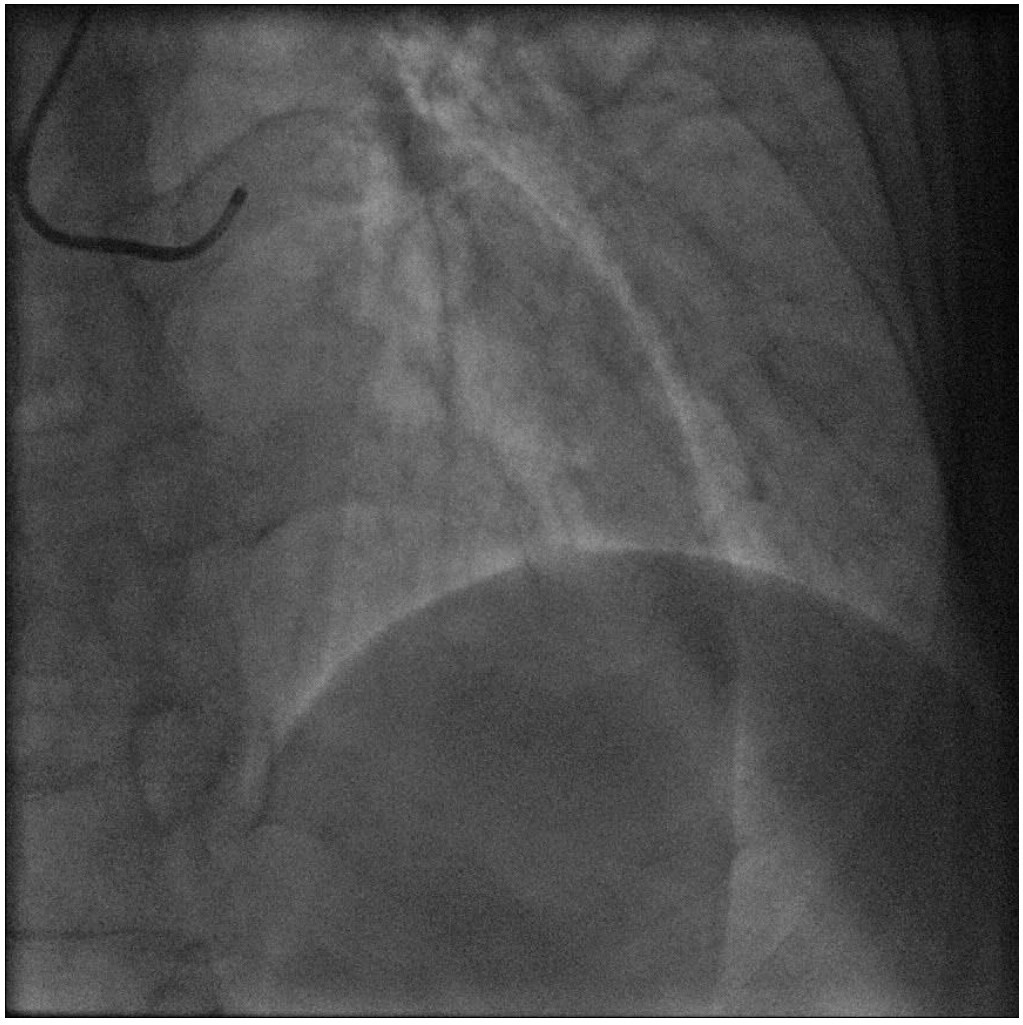
Plaque Rupture

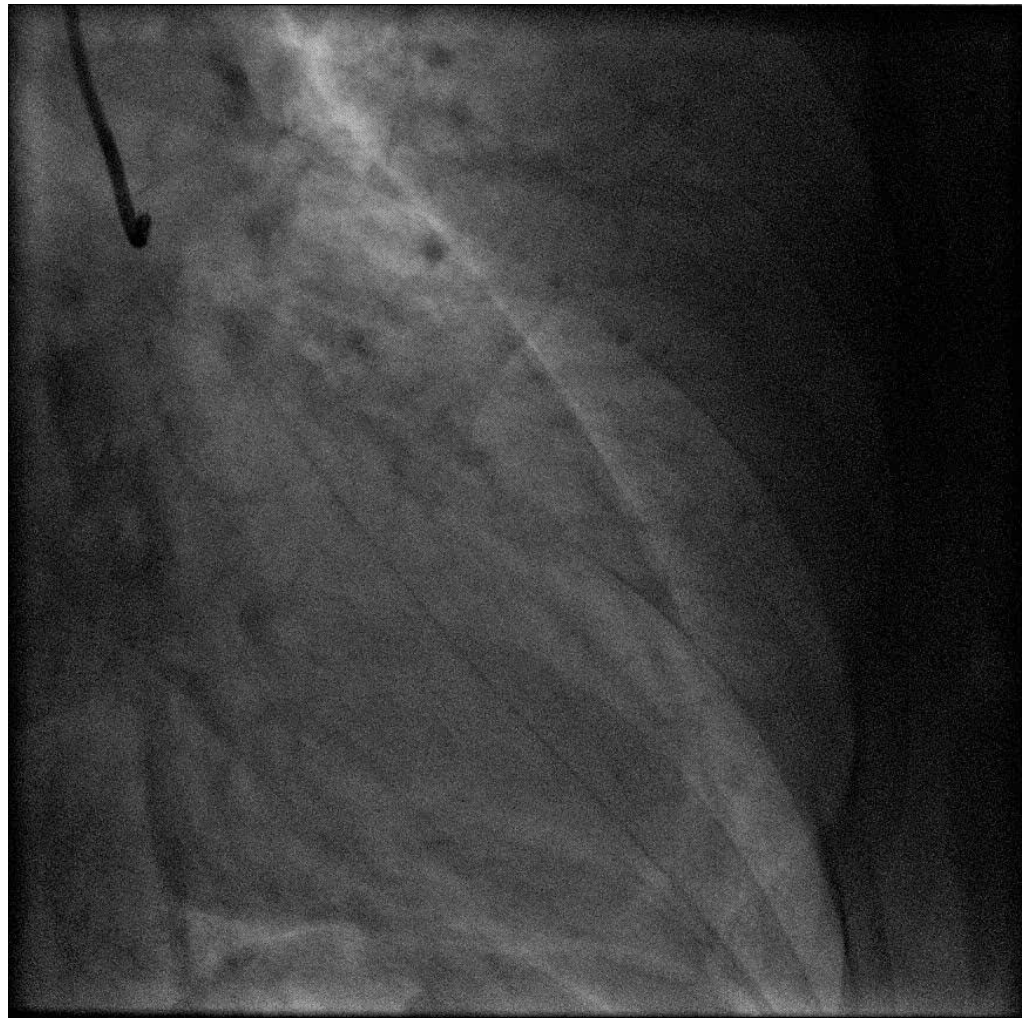


Plaque Erosion

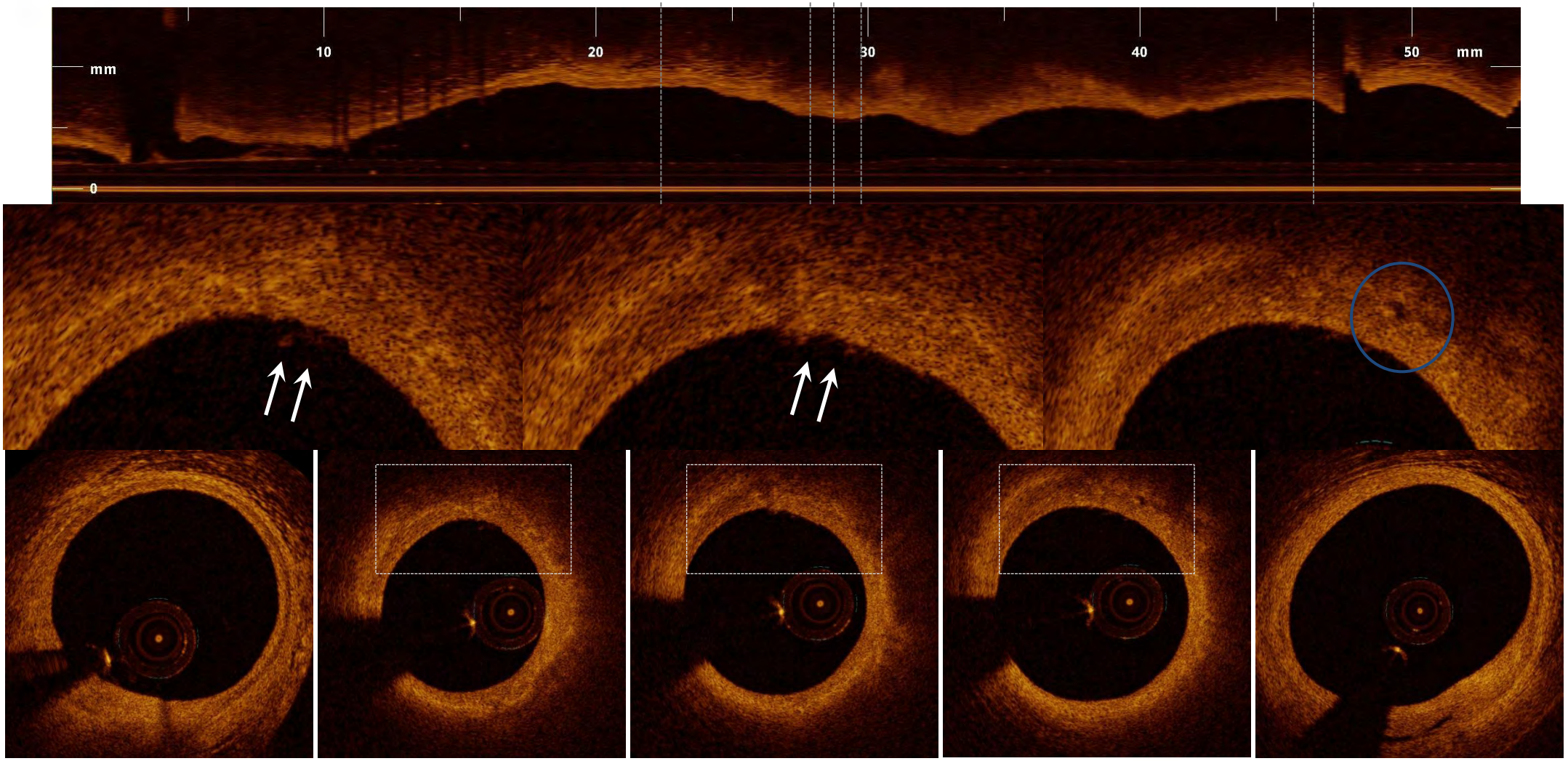
To decide not to intervene..

63 yrs Anterior STEMI

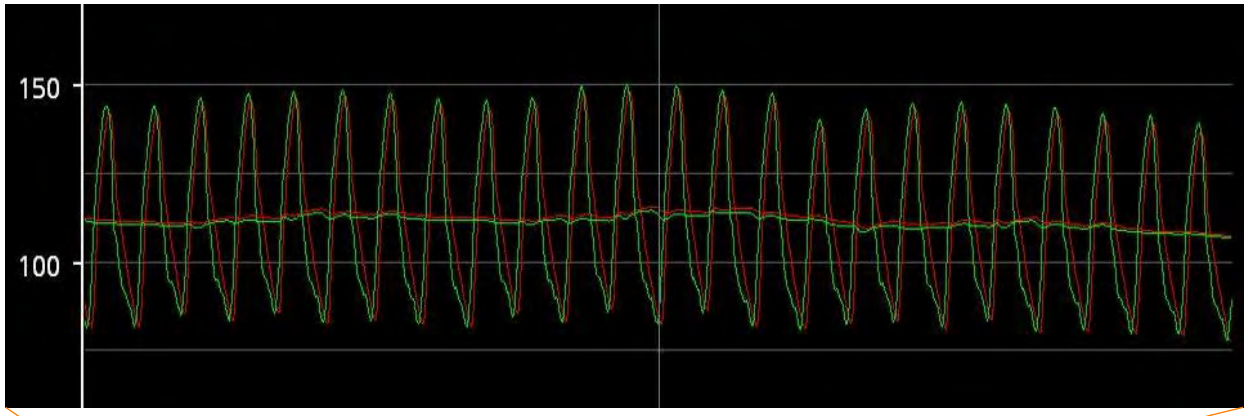




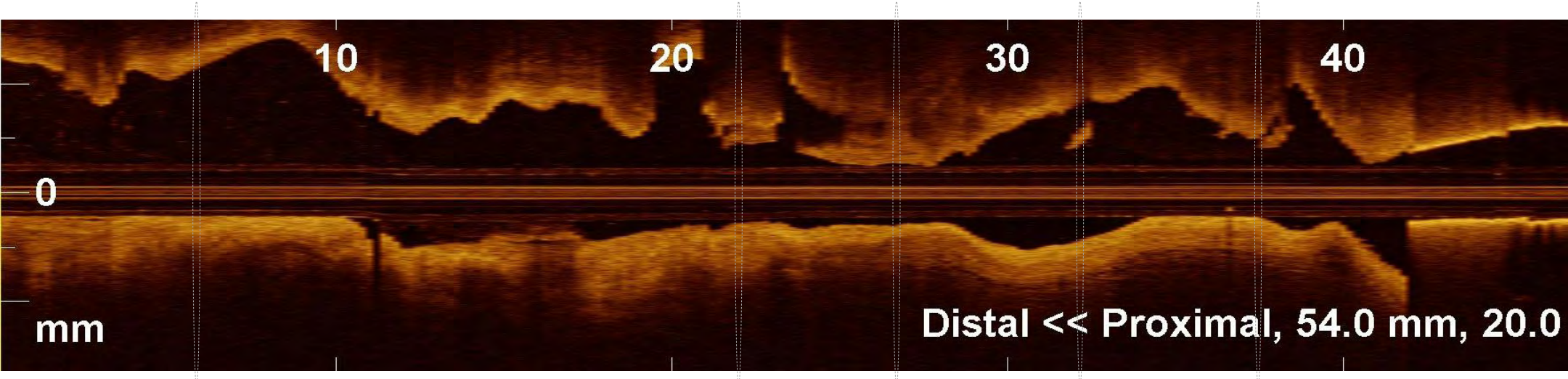
Culprit LAD: **Plaque erosion**

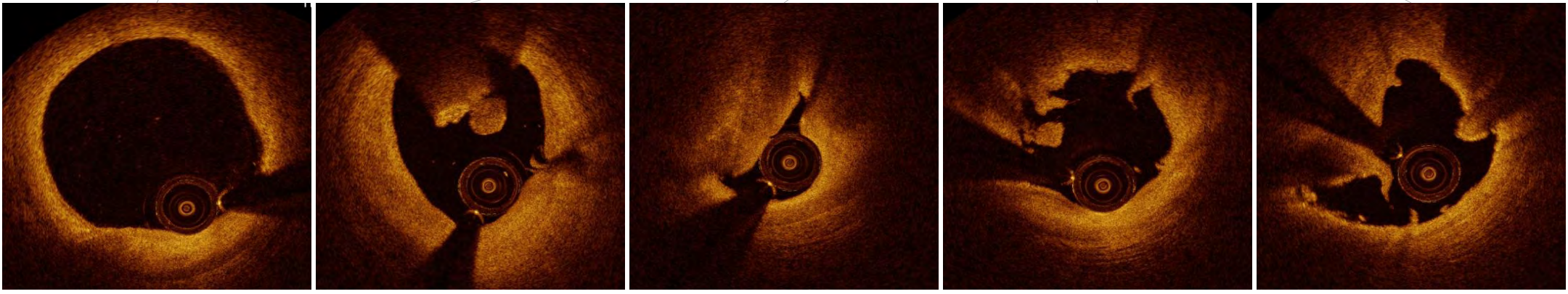


Morphologic + Functional Assessment = Statin +DAPT



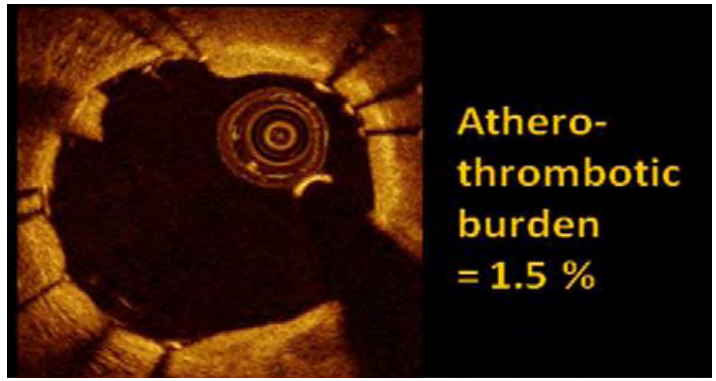
STEMI: Remaining Thrombus After Thrombectomy



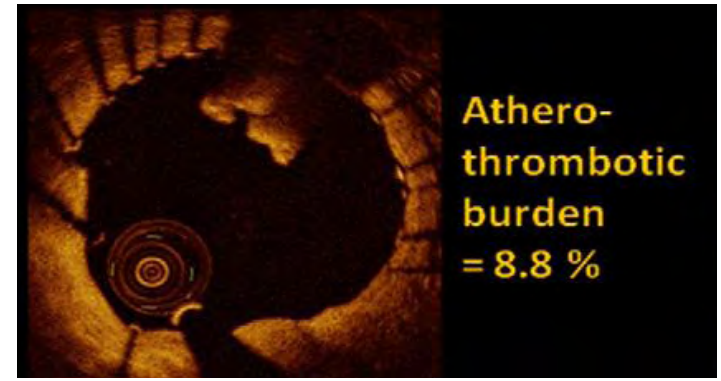


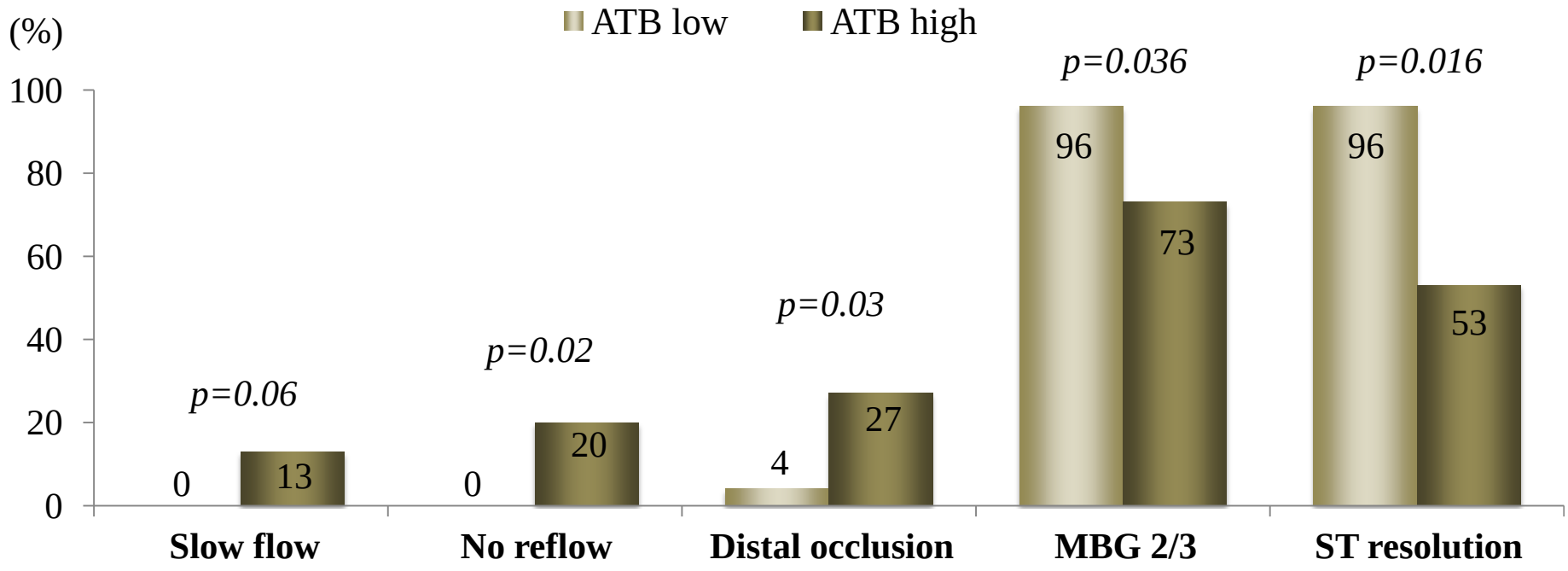
OCT quantification of residual atherothrombotic burden after stenting in AMI

ATB_{low} (Area < 4%)



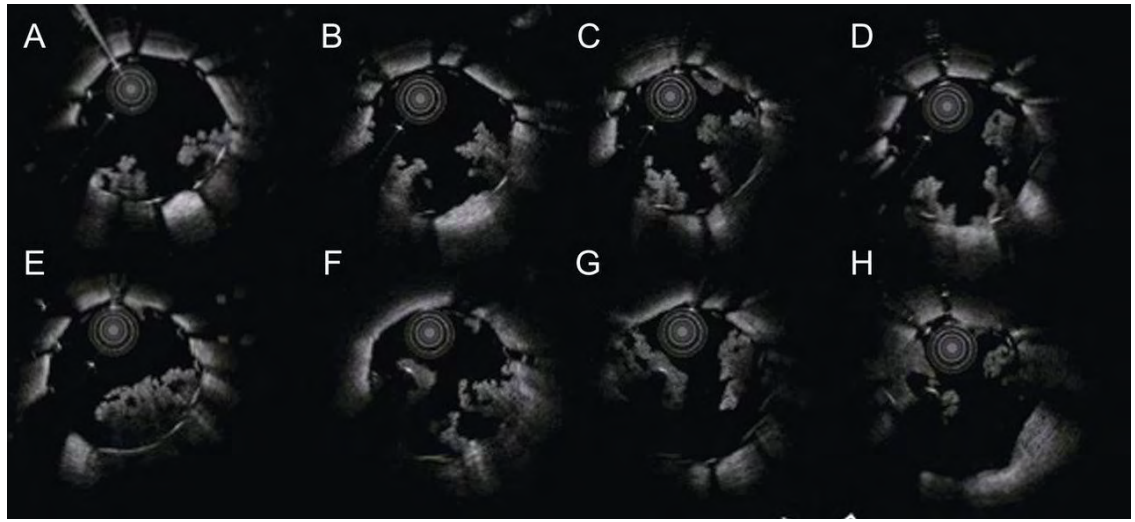
ATB_{high} (Area ≥ 4%)





Magro M, et al. Int J Cardiol 2012 Mar 27. Epub ahead of print.

Effect of manual thrombus aspiration on Flow Area in STEMI



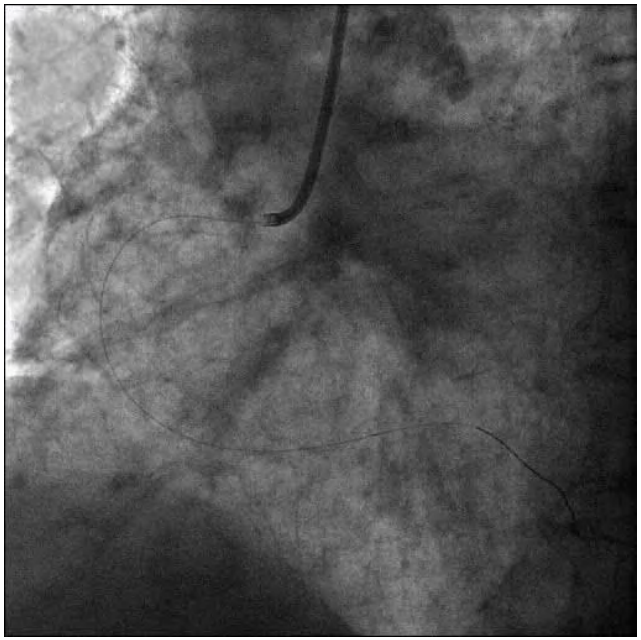
European Heart Journal

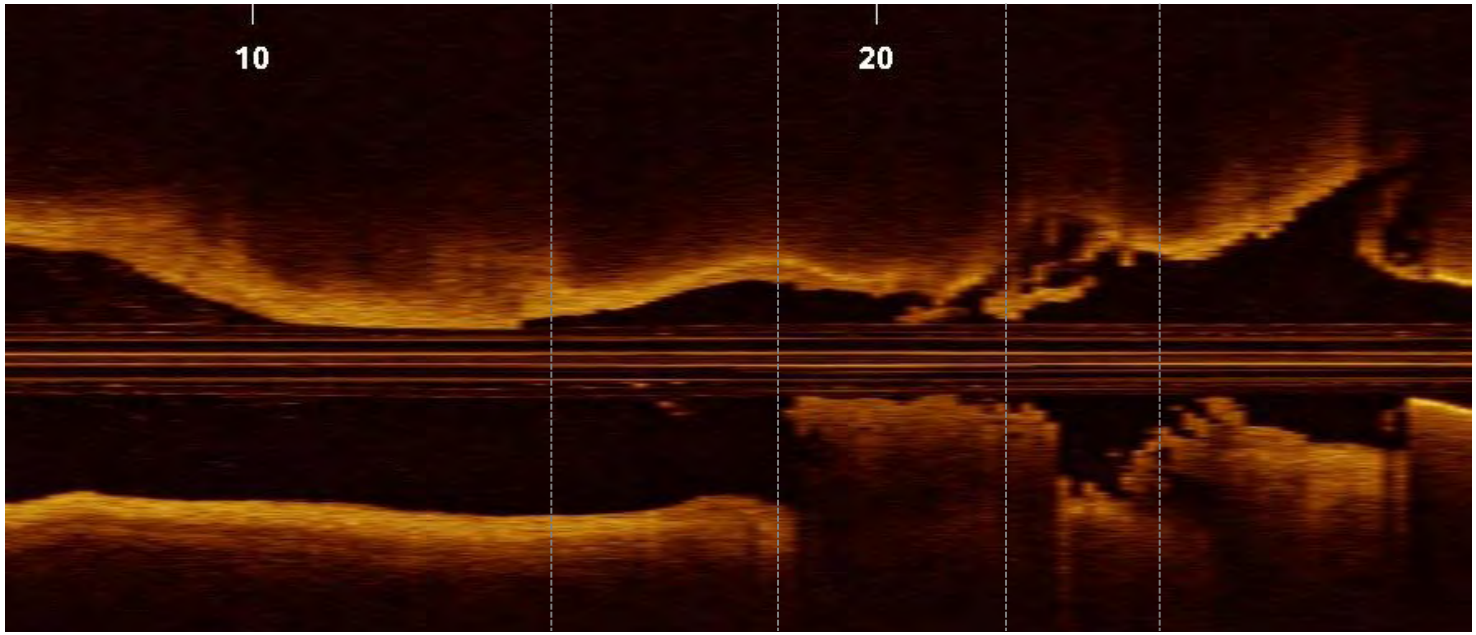
	Thromb + 66 lesions	Thromb - 61 lesions	*p*
Stent length, mm	22.0 ± 9.86	21.1 ± 7.69	0.56
Mean intra-stent structure area, mm^2 (protrusion + isolated intraluminal mass)	0.36 ± 0.22	0.34 ± 0.21	0.46
Mean flow area, mm^2	8.71 ± 2.28	8.04 ± 2.13	0.09
Minimum lumen area, mm^2	7.10 ± 2.13	6.52 ± 1.99	0.11

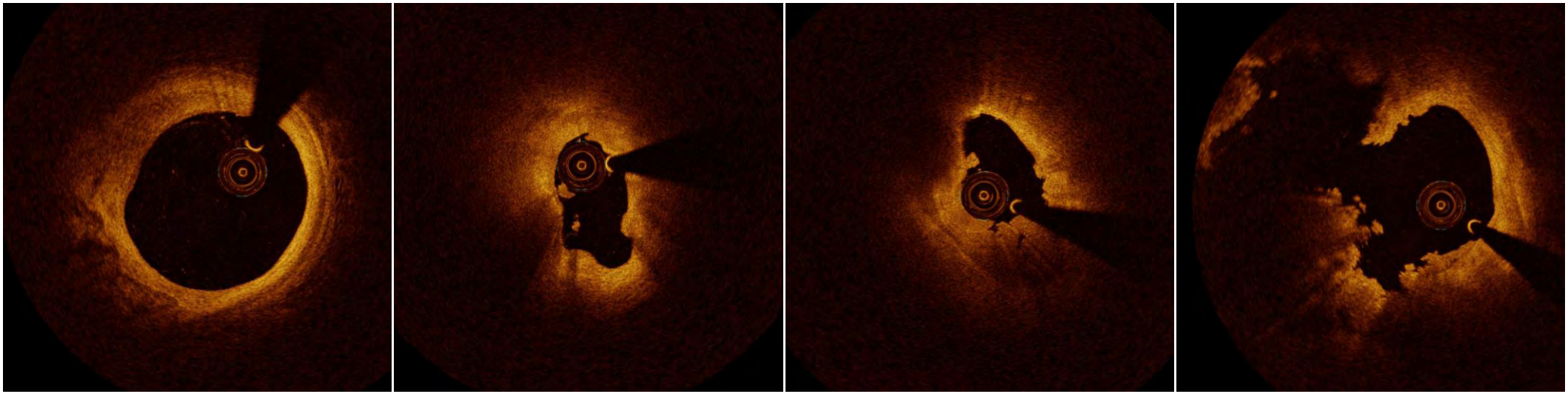
Onuma Y, et al. Eur Heart J (2013) doi: 10.1093/eurheartj/ehs456

leaving fresh thrombus…

Immediately after aspiration

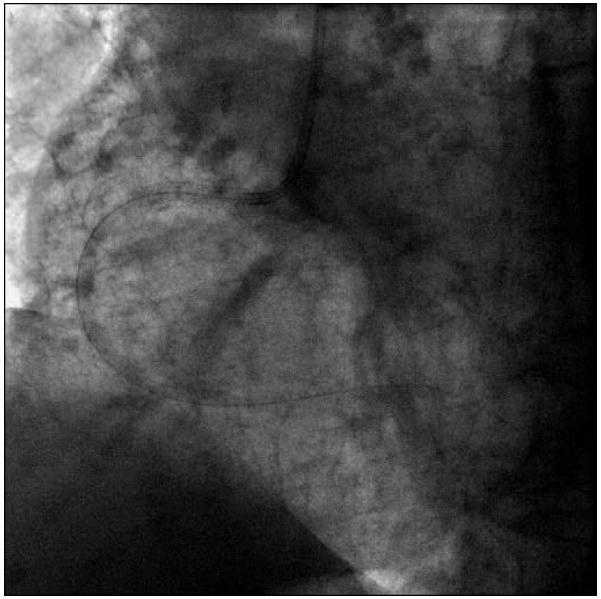


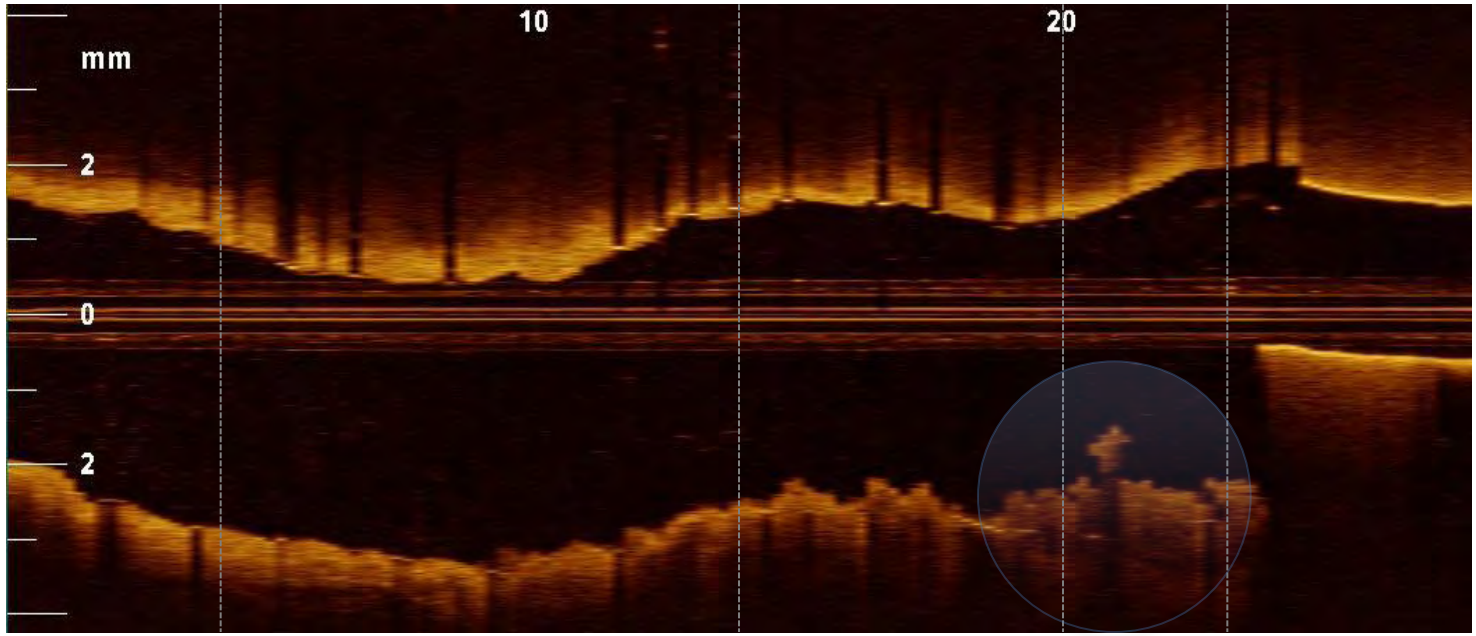


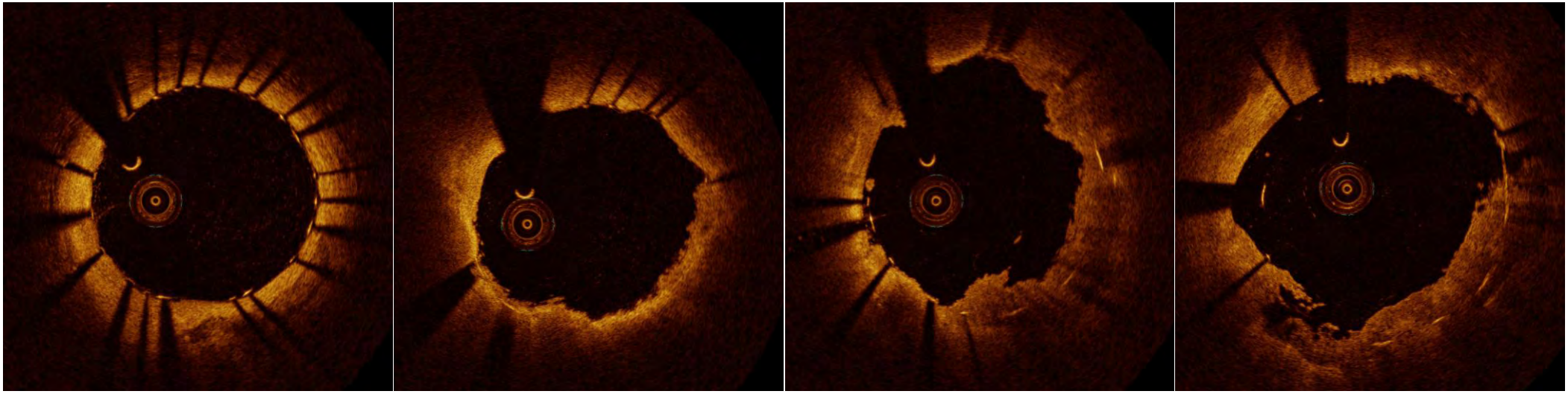


Courtesy of R. Garbo, Ospedale S. Giovanni Bosco

….thrombus remains *after stent implantation*

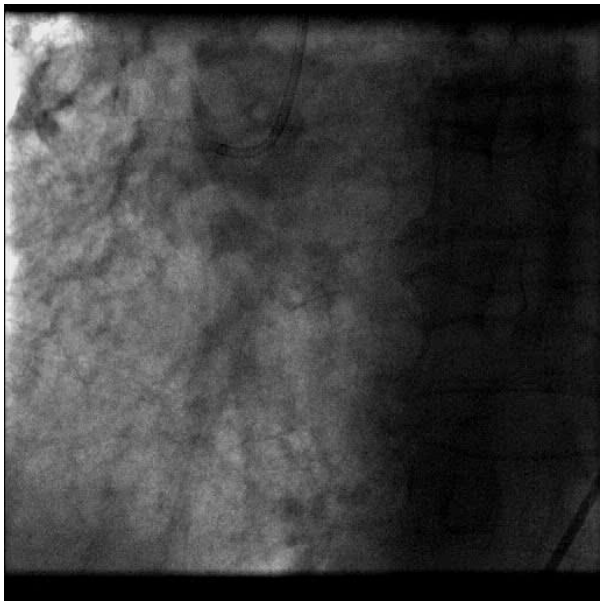


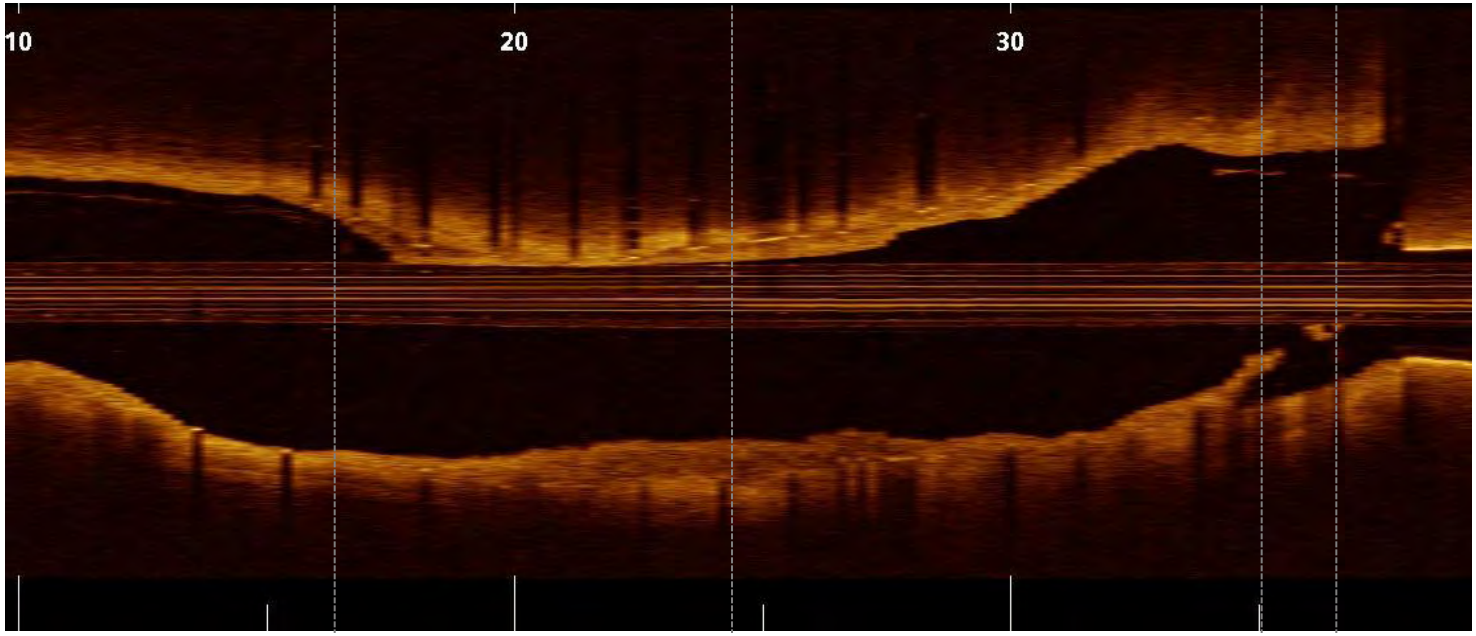


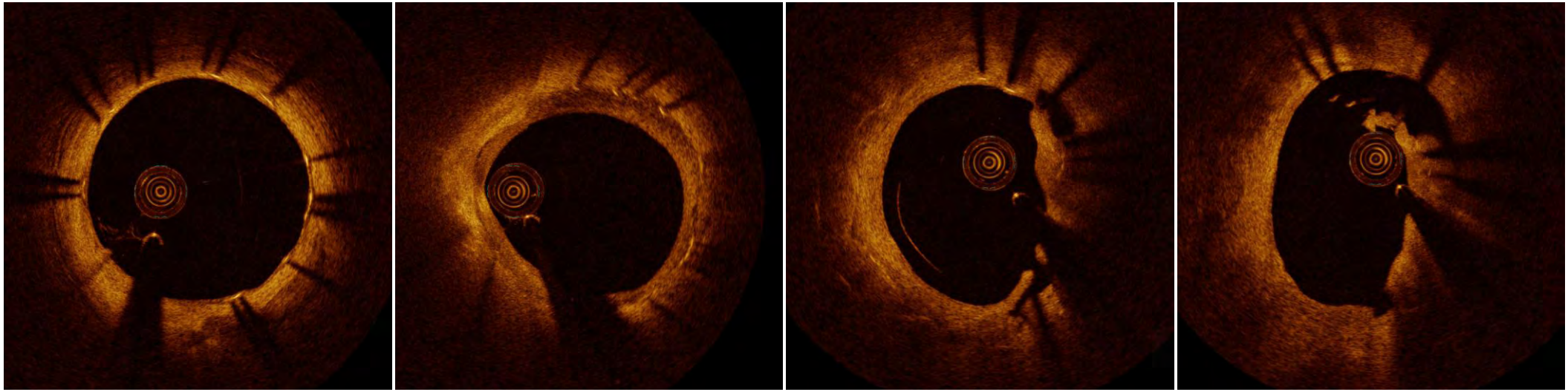


Courtesy of R. Garbo, Ospedale S. Giovanni Bosco

……thrombus may reabsorb with stent malapposition *9 mos FU*



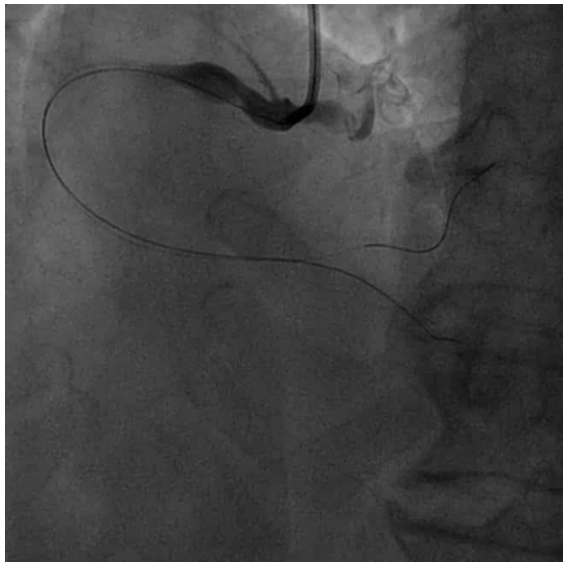


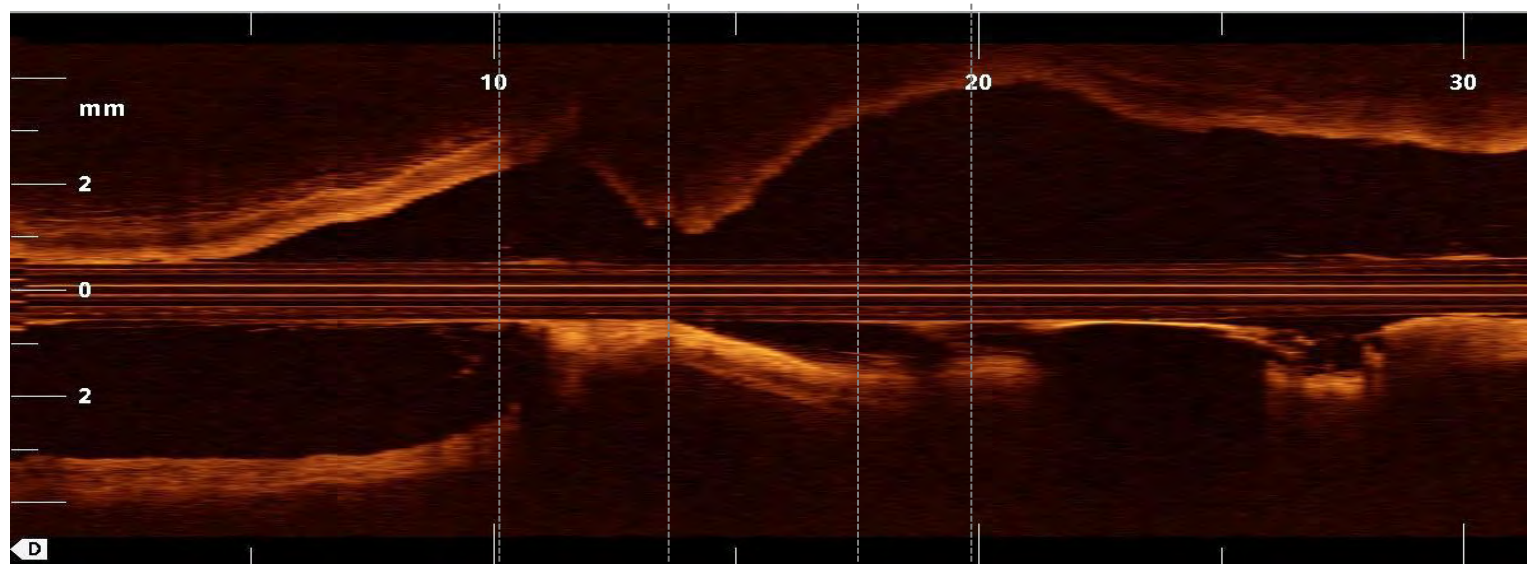


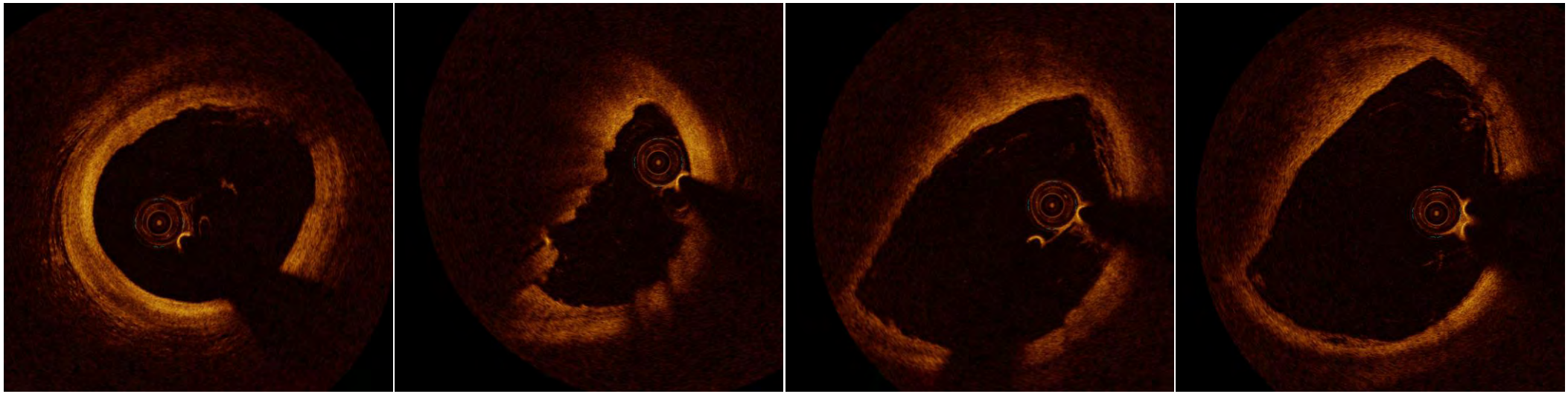
Courtesy of R. Garbo, Ospedale S. Giovanni Bosco

leaving organized thrombus…

Immediately after aspiration

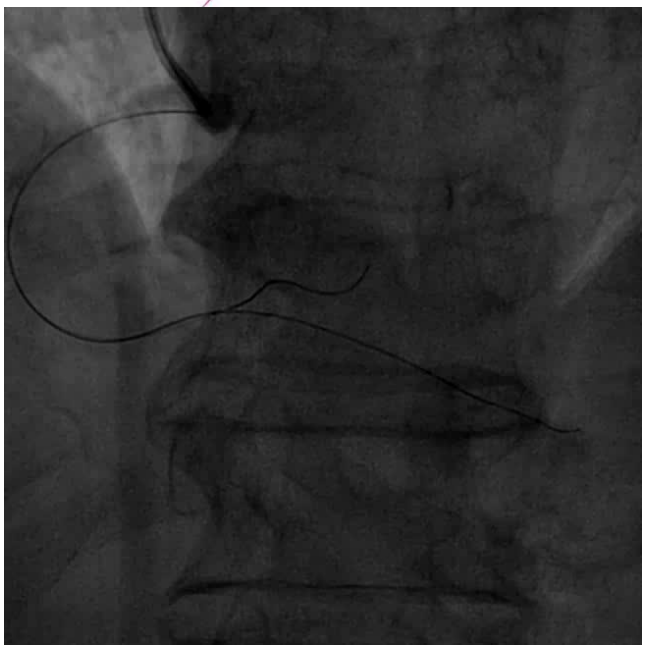


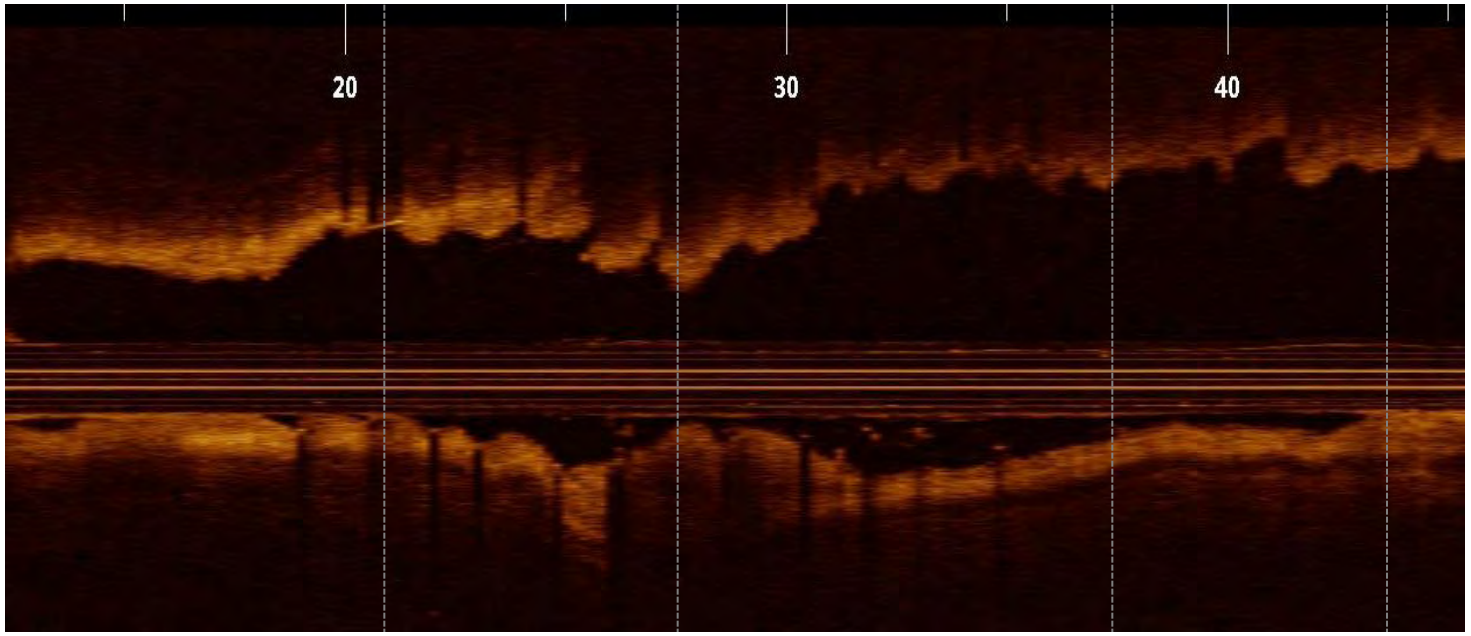


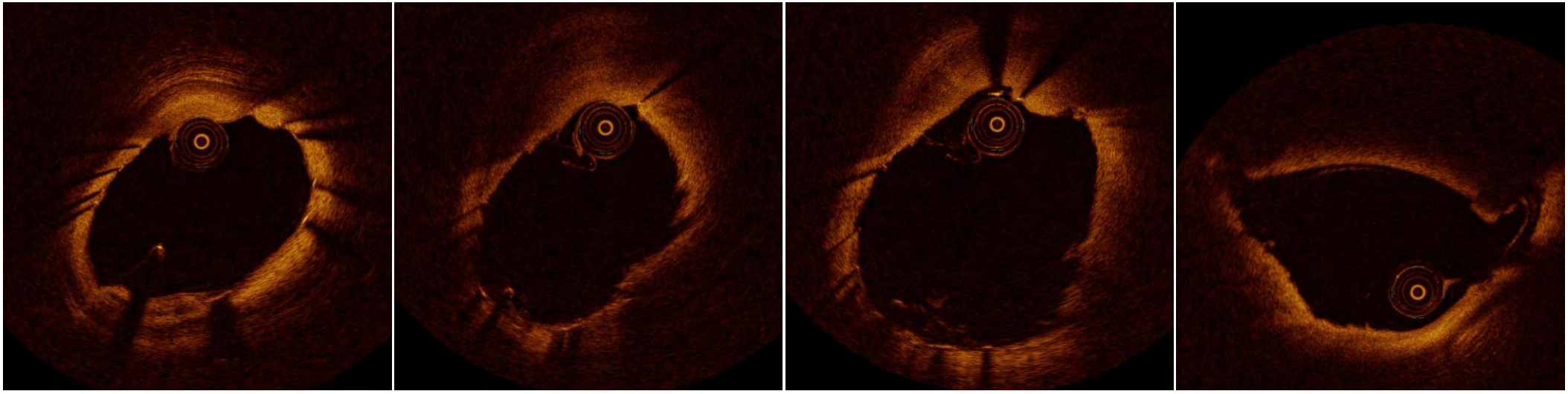


Courtesy of M. Fineschi, Ospedale le Scotte

…thrombus protrudes ***after stent implantation***



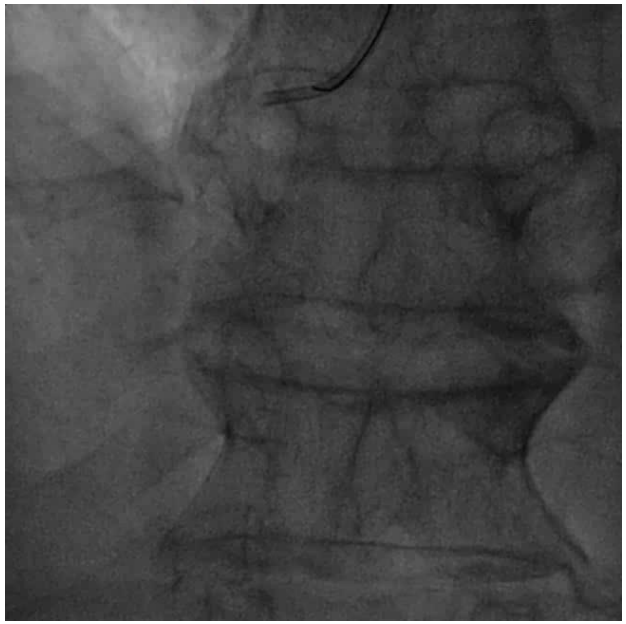


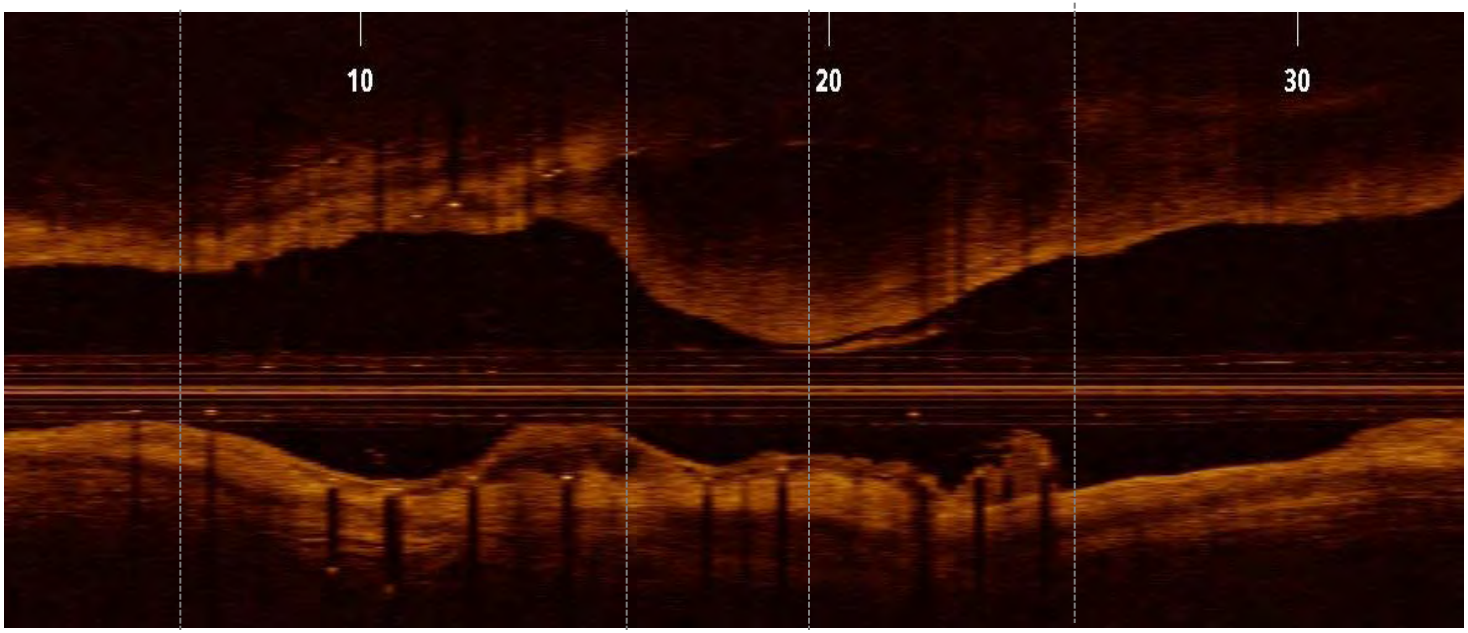


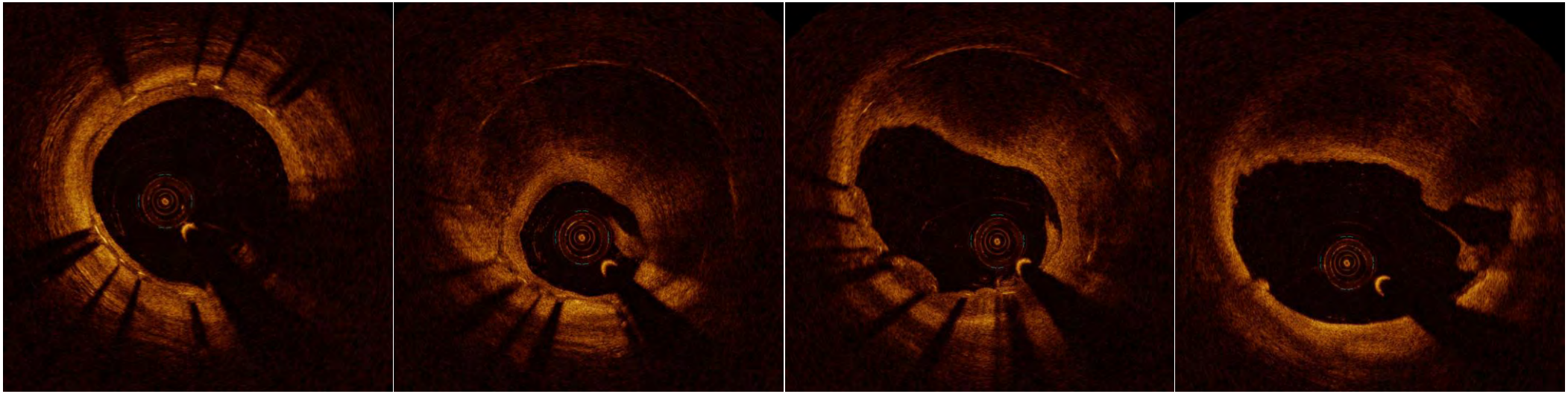
Courtesy of M. Fineschi, Ospedale le Scotte

…acting as a core for neoatherosclerosis

9 mos FU



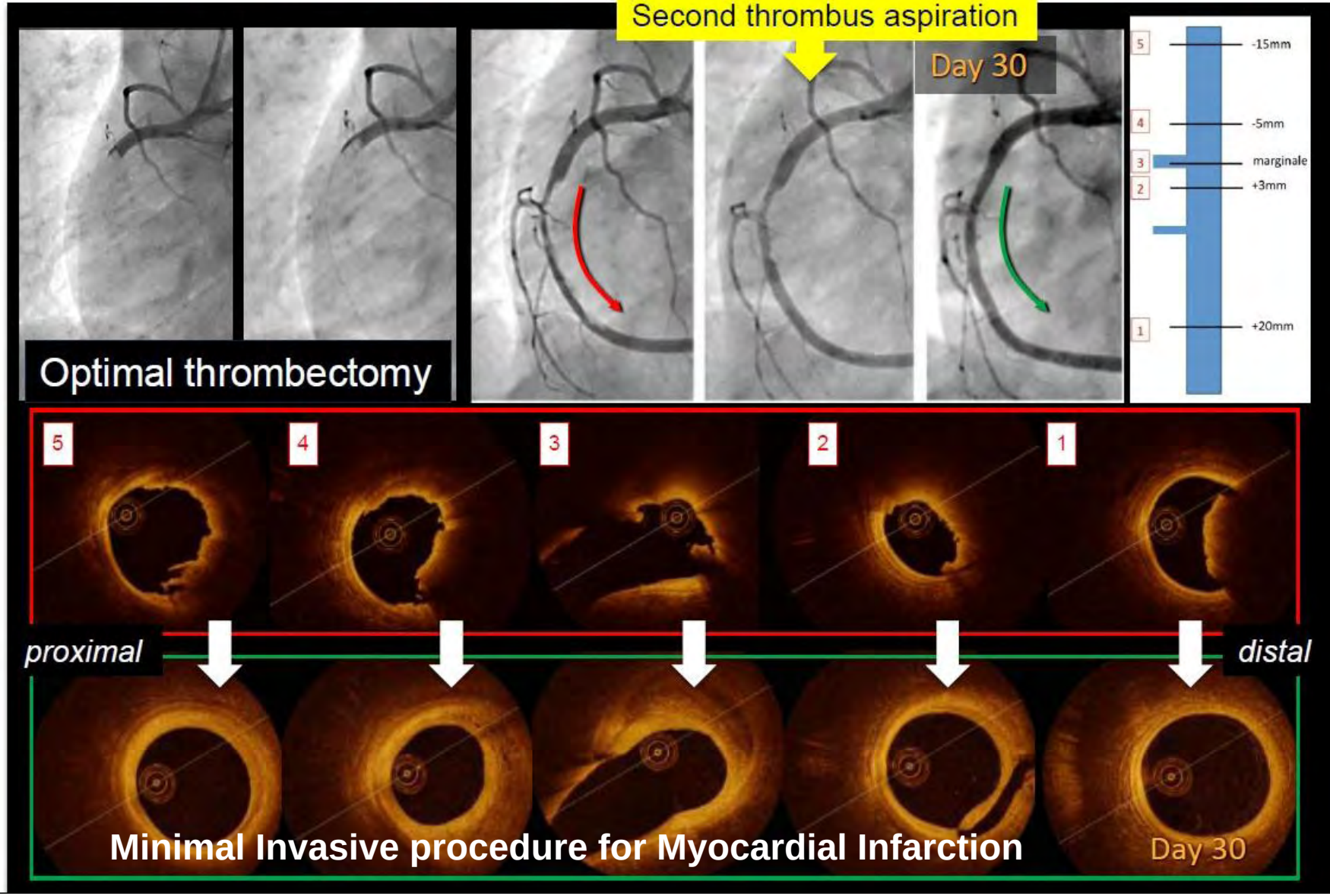




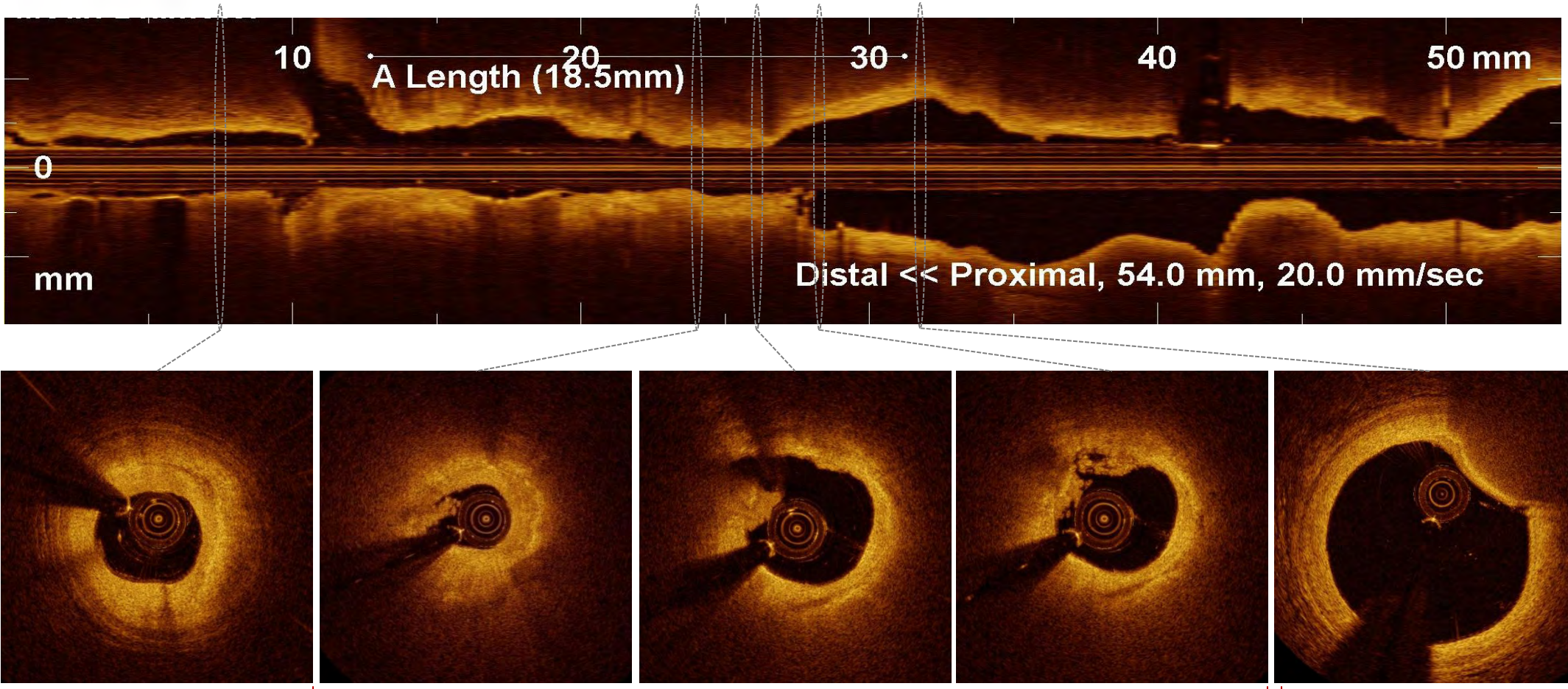
Courtesy of M. Fineschi, Ospedale le Scotte

OCT and Acute Coronary Syndrome

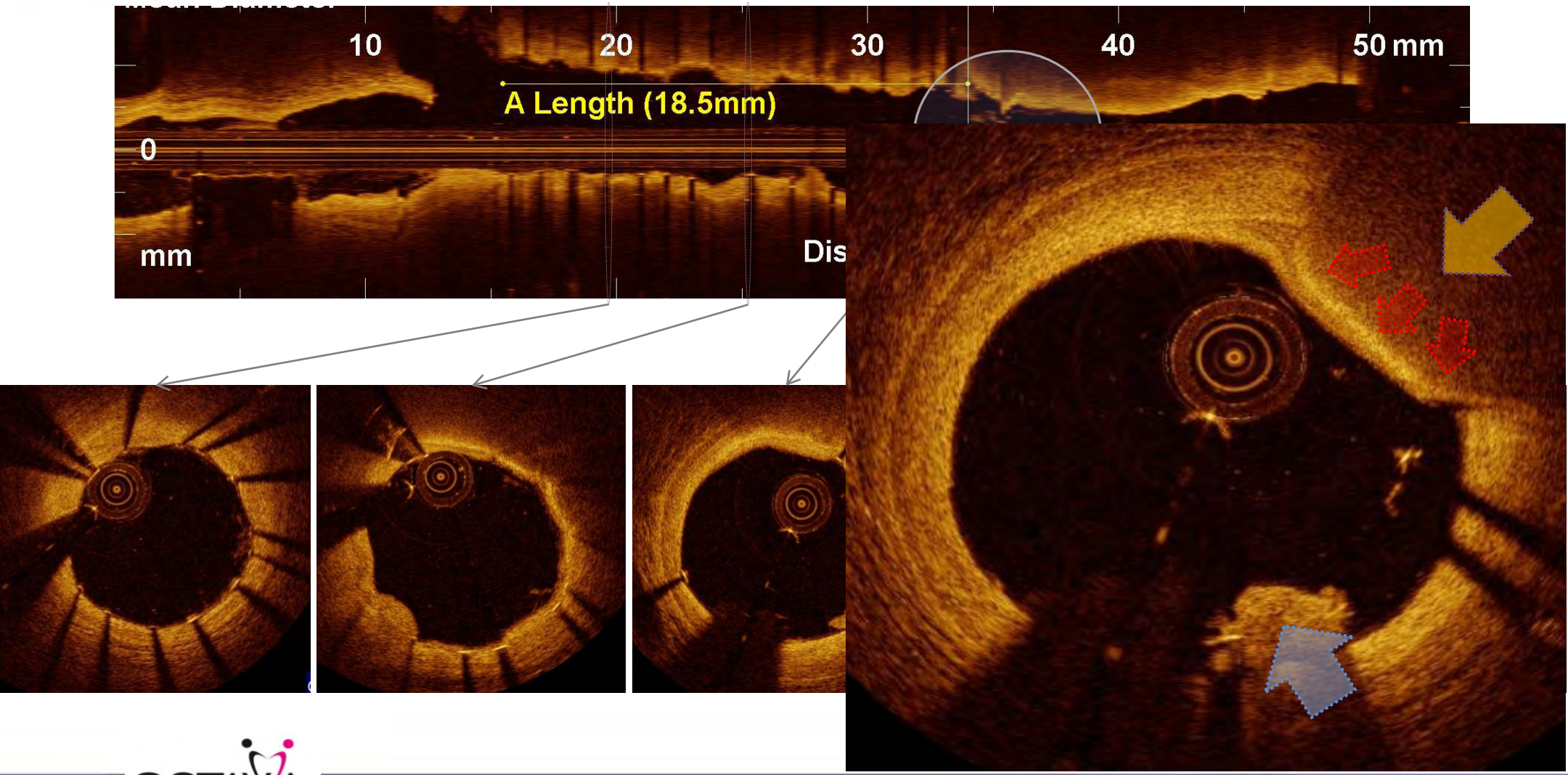
With Courtesy of Prof. P. Motreff, University Hospital, Clermont-Ferrand (FRANCE)



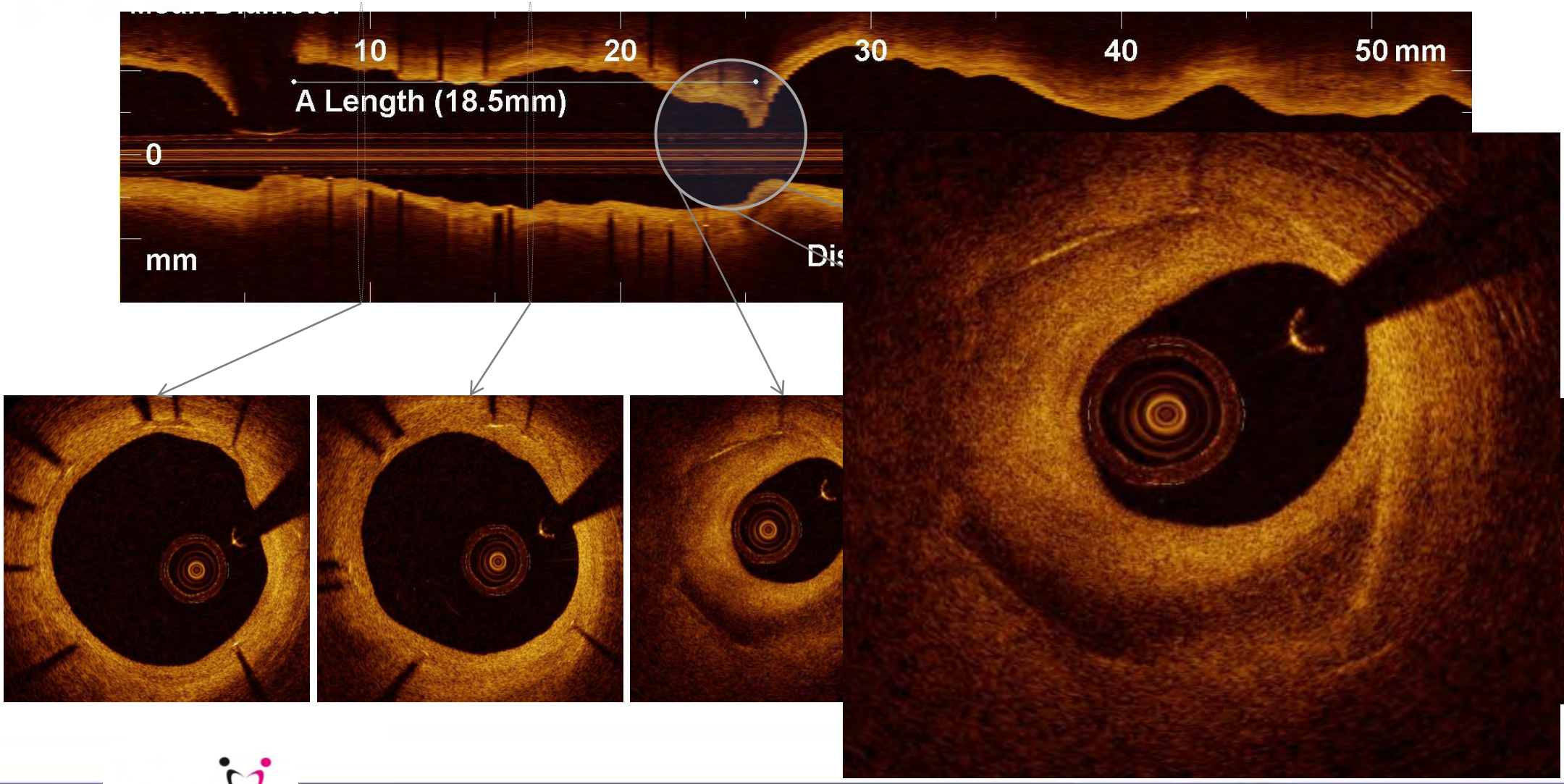
To Avoid DES Failure: detecting TFCA at Landing Zone



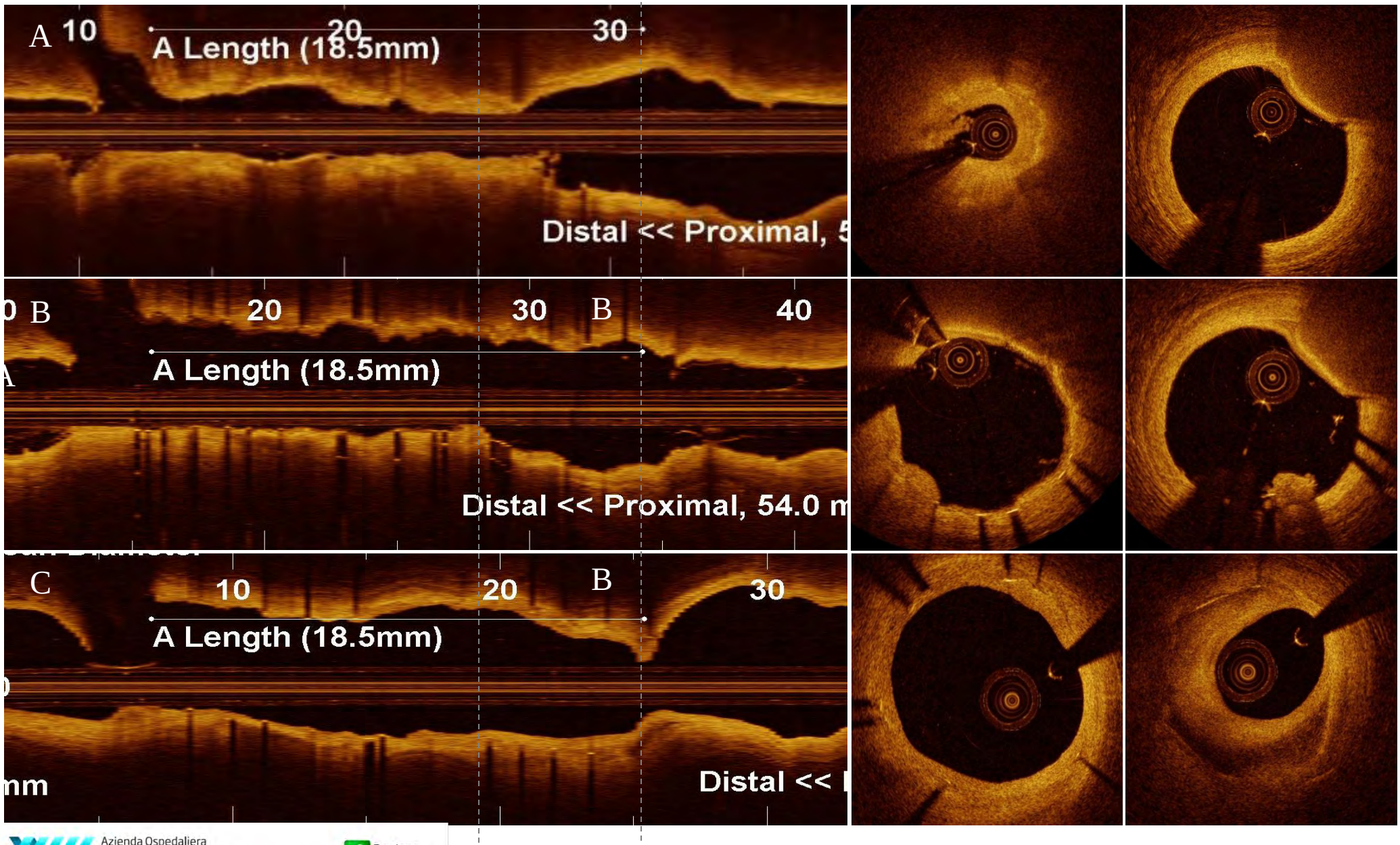
TFCA at the Landing Zone



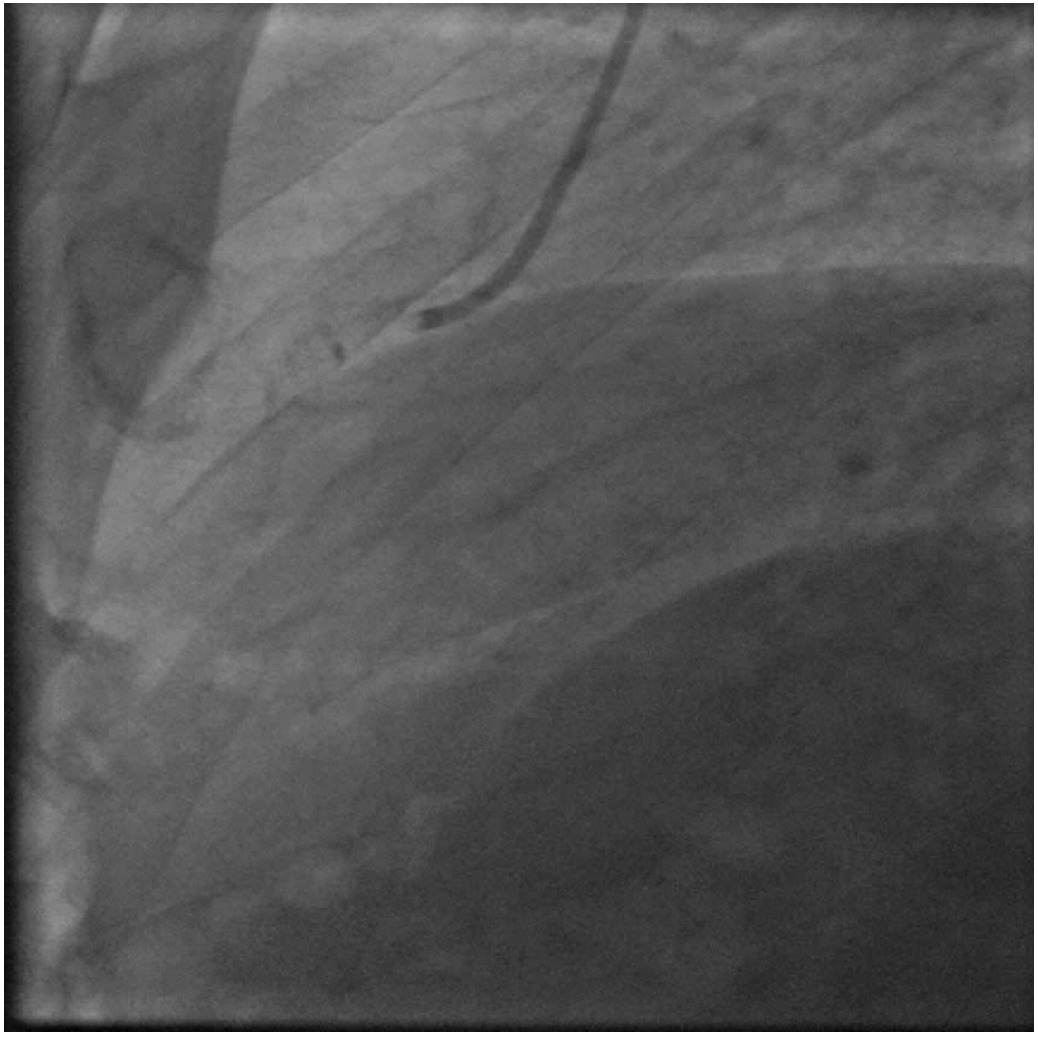
Focal Edge Restenosis with Lipid-Laden Neointima

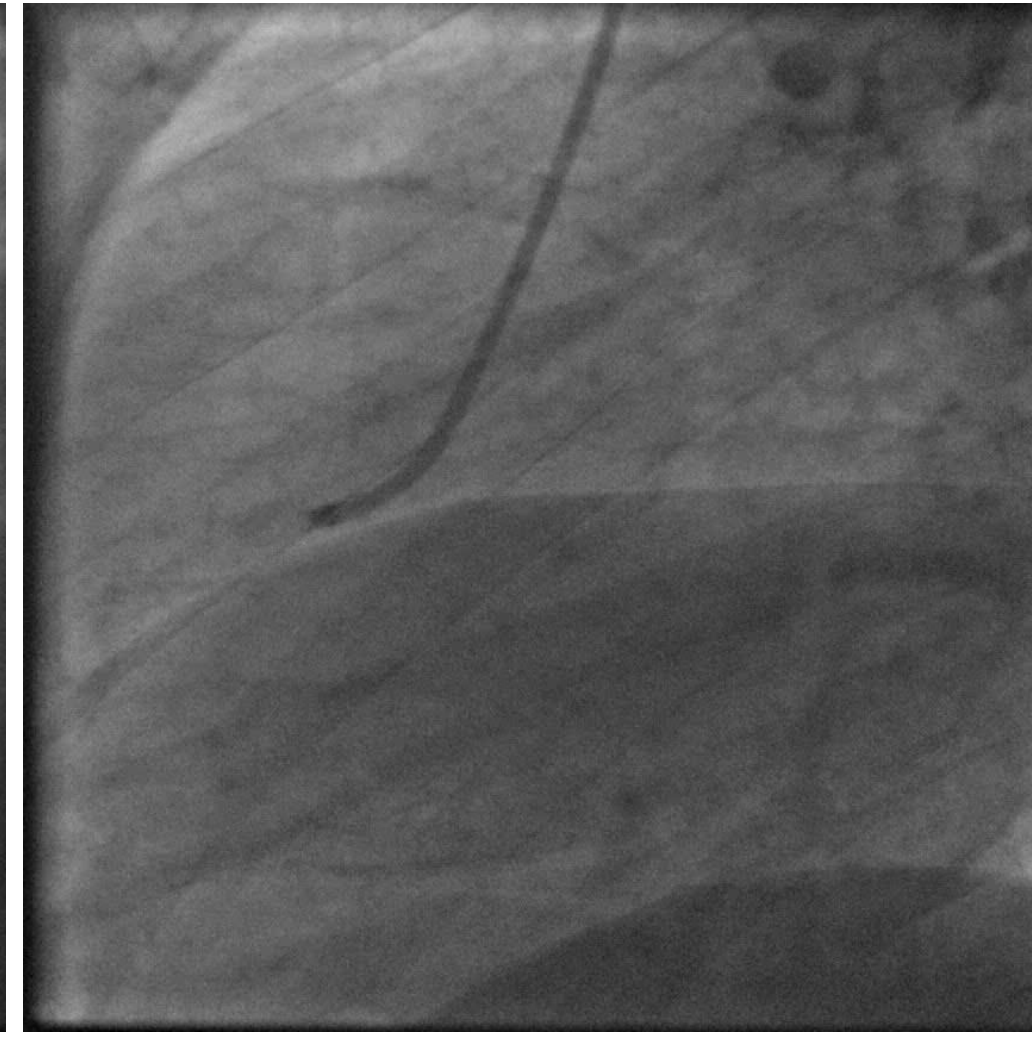


To Avoid DES Failure: detecting TFCA at Landing Zone



STEMI: Detecting ectasia at the landing zone





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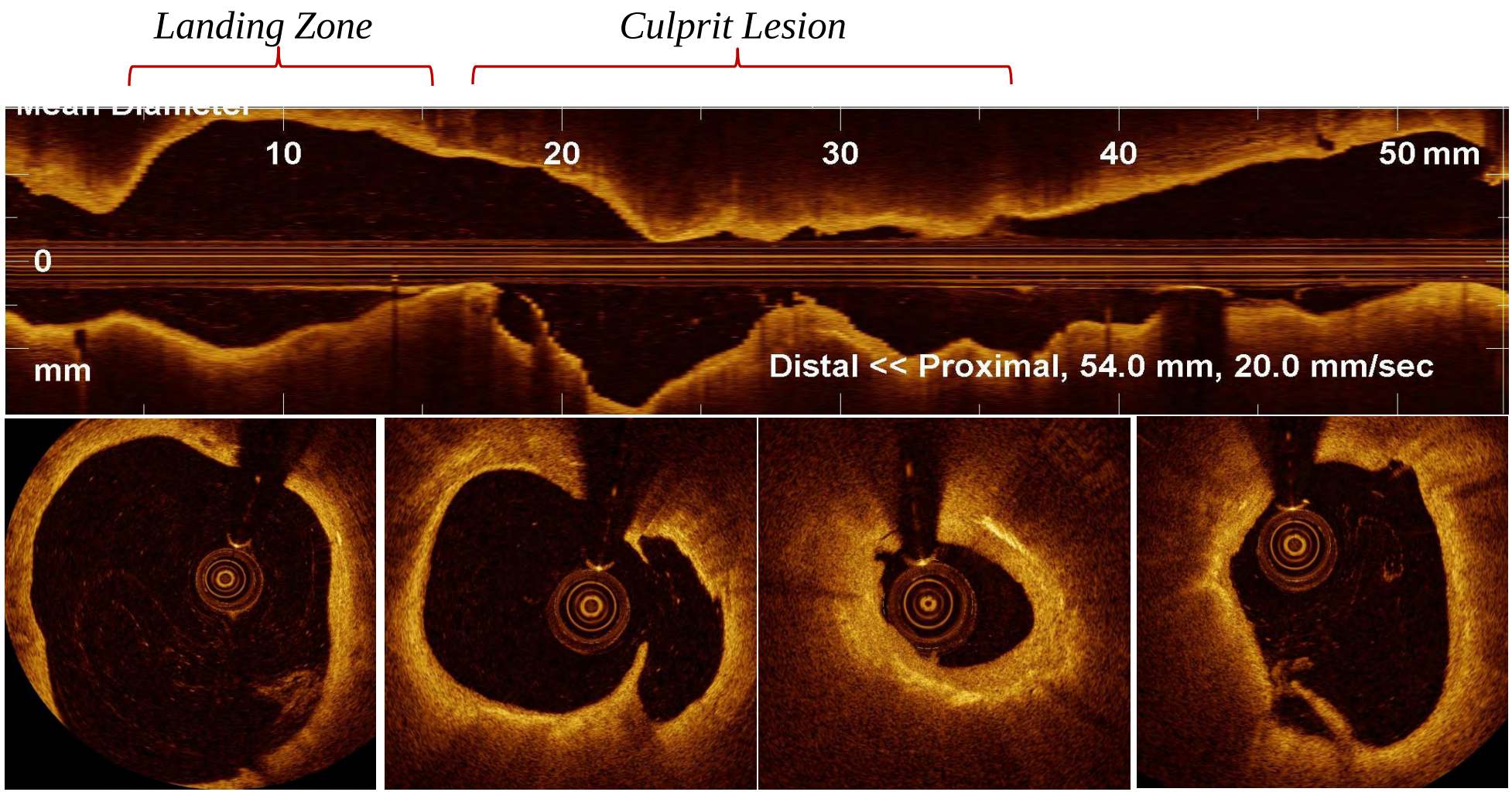
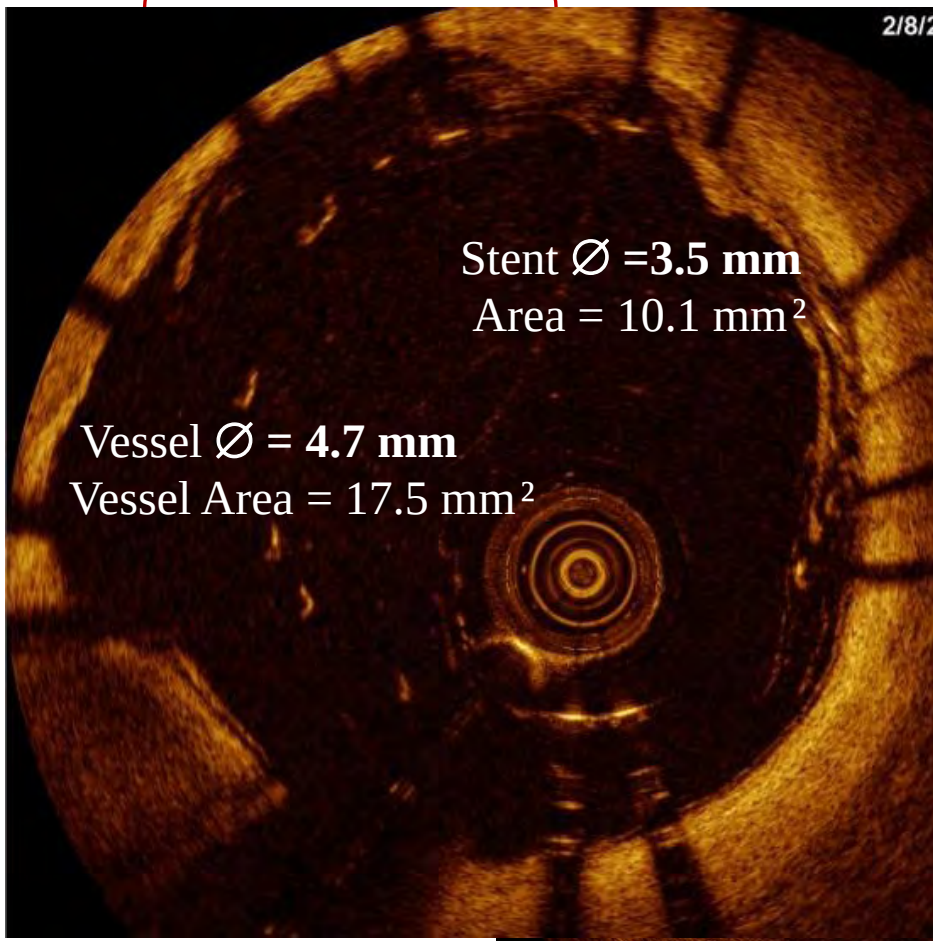
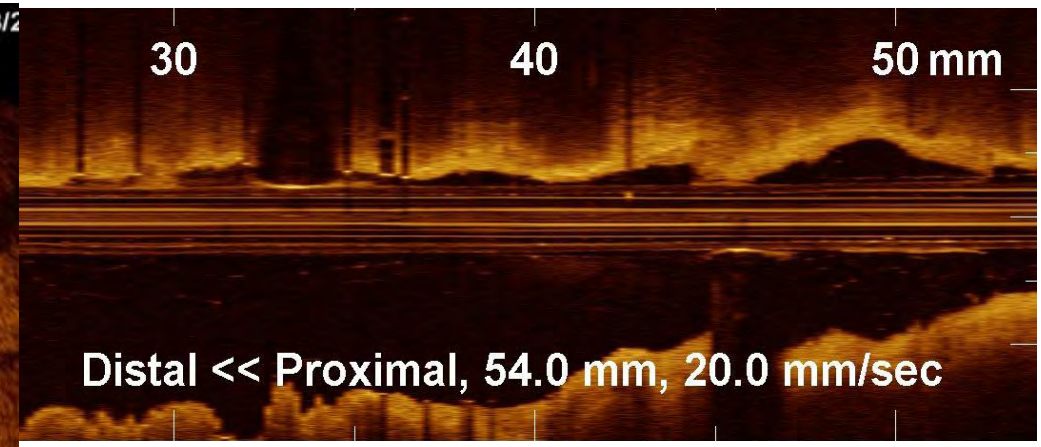
Ectasia at the Landing Zone

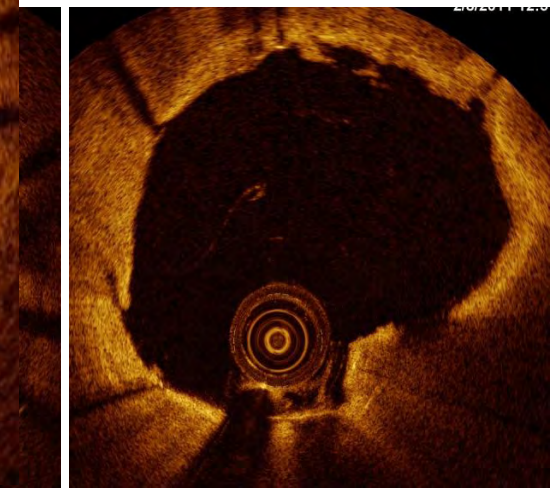


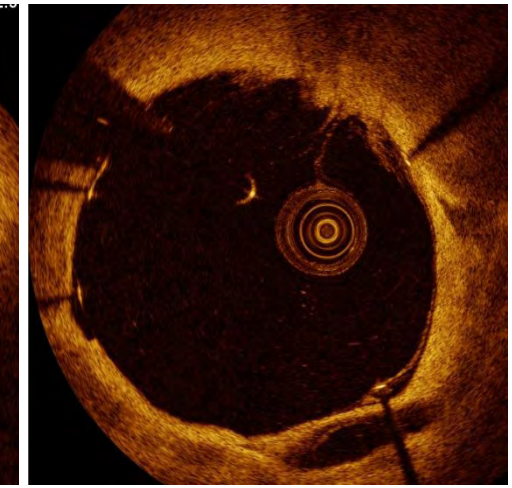
Immediately post DES implantation: 3.0 x 28 mm, post-dil NC 3.5 HP

Large area of malapposed struts angiographically invisible









∅ =3.4 mm
Area= 9.1 mm²

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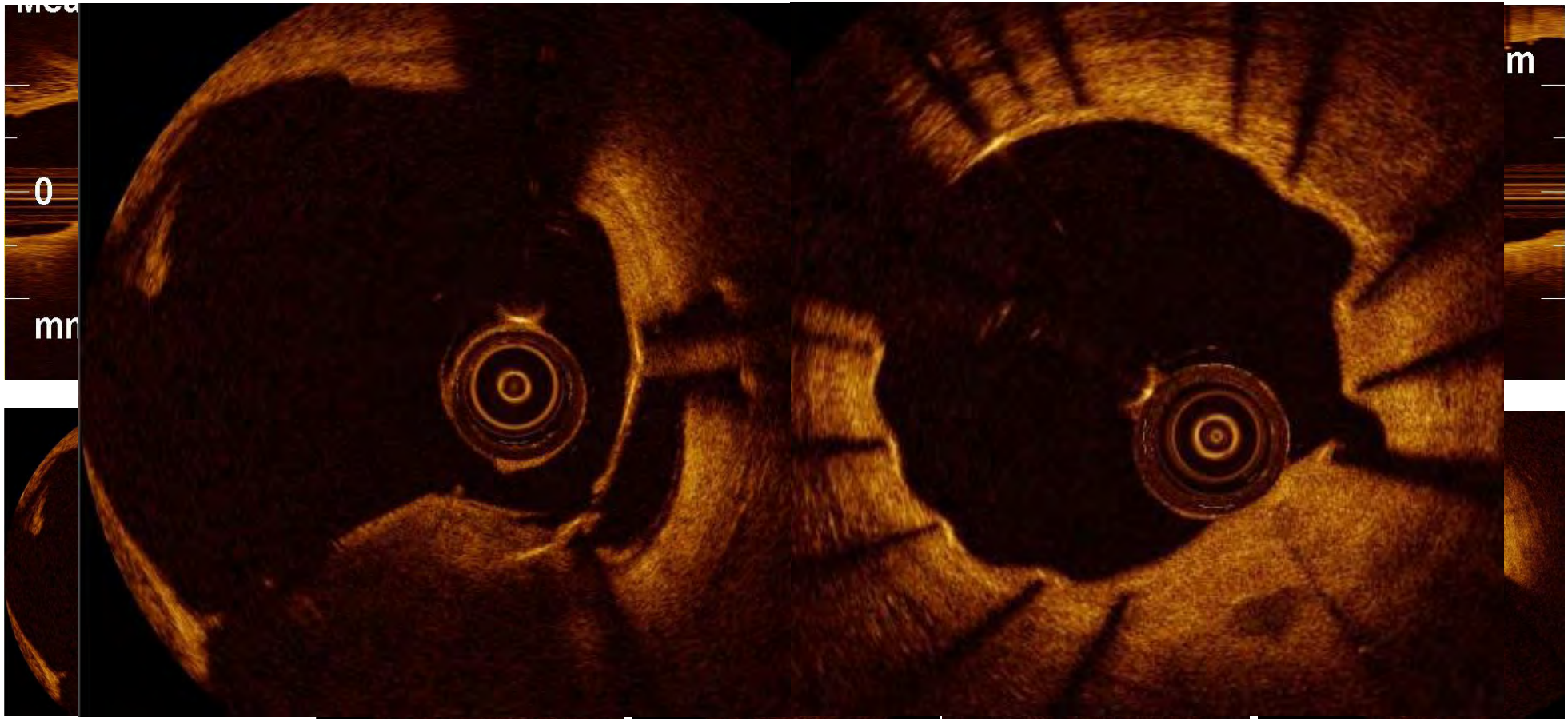
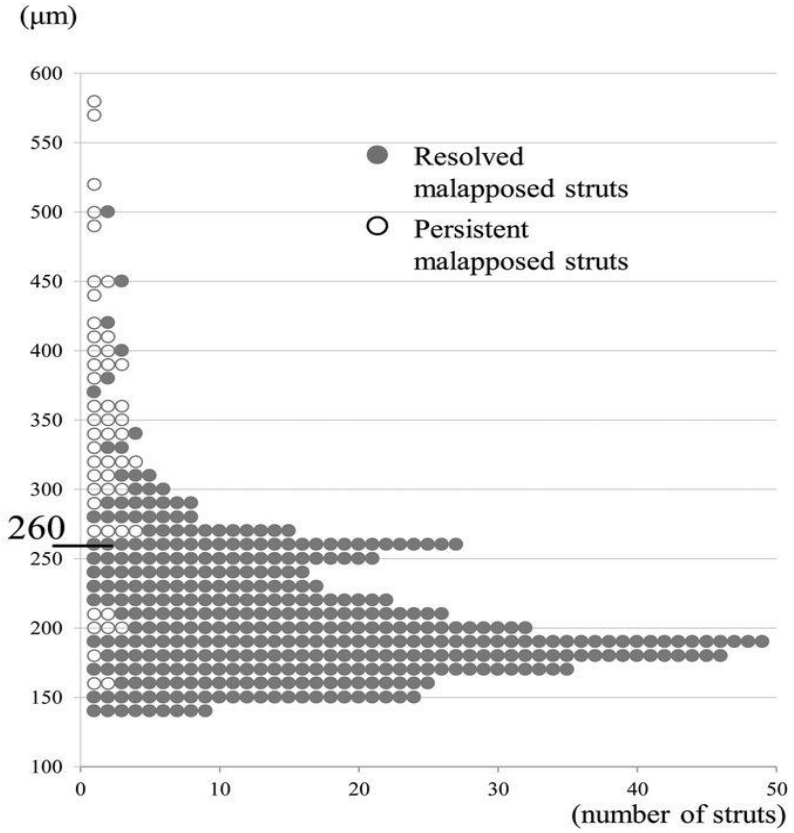
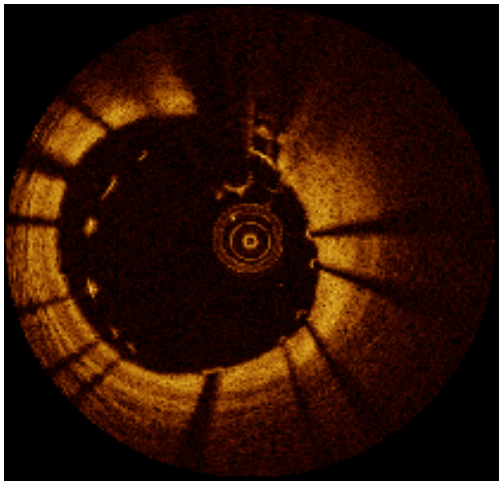
9 Months elective FU: Asymptomatic



European Heart Journal Cardiovascular Imaging

Kawamori H et al. Eur Heart J Cardiovasc Imaging 2013;ehjci.jes299





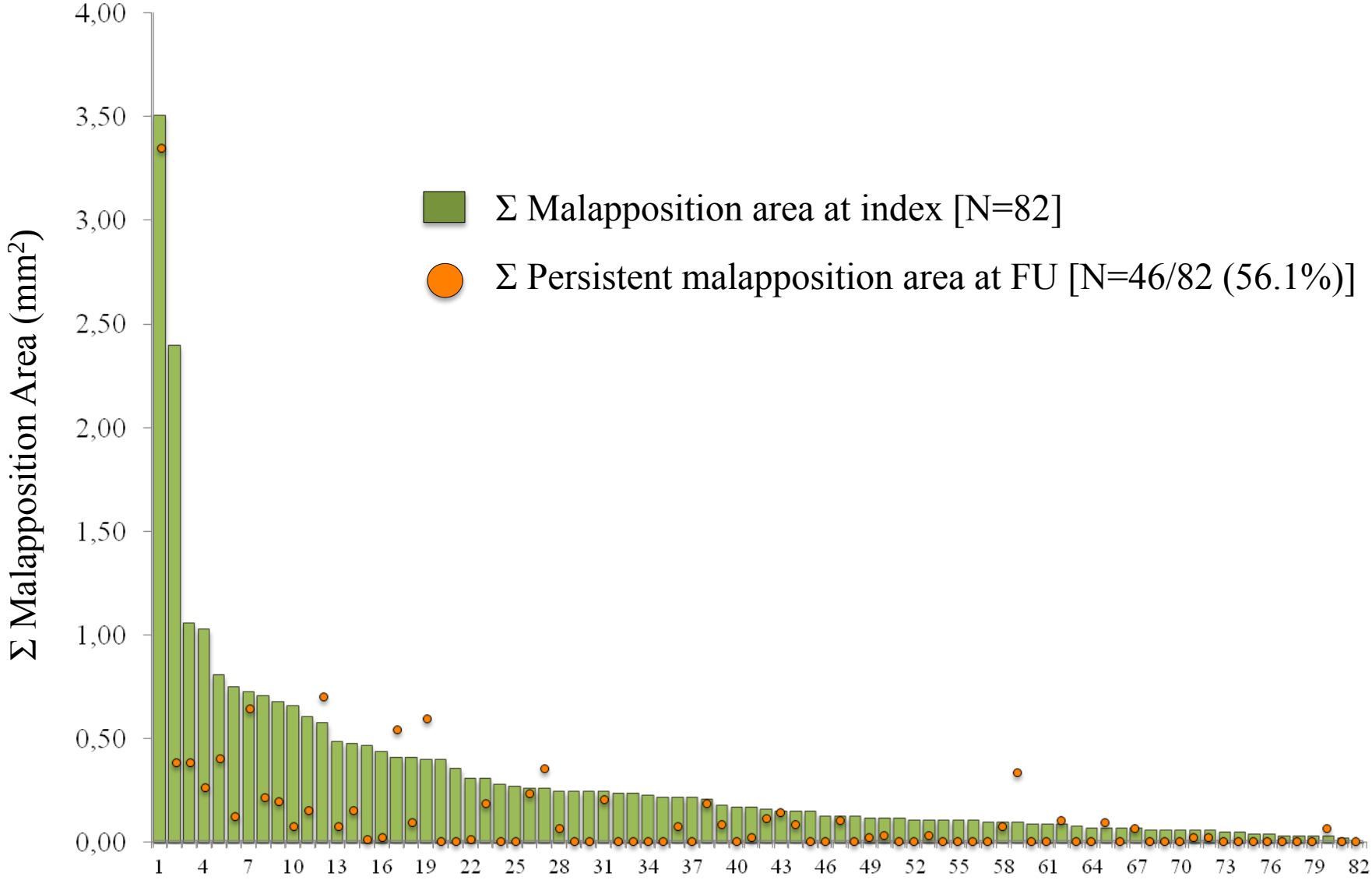
% Pts with at least 1 strut >260 μm of malapposition distance at post-procedure: 52%

Which one should be tackled?

Courtesy of OCTAVIA Investigator

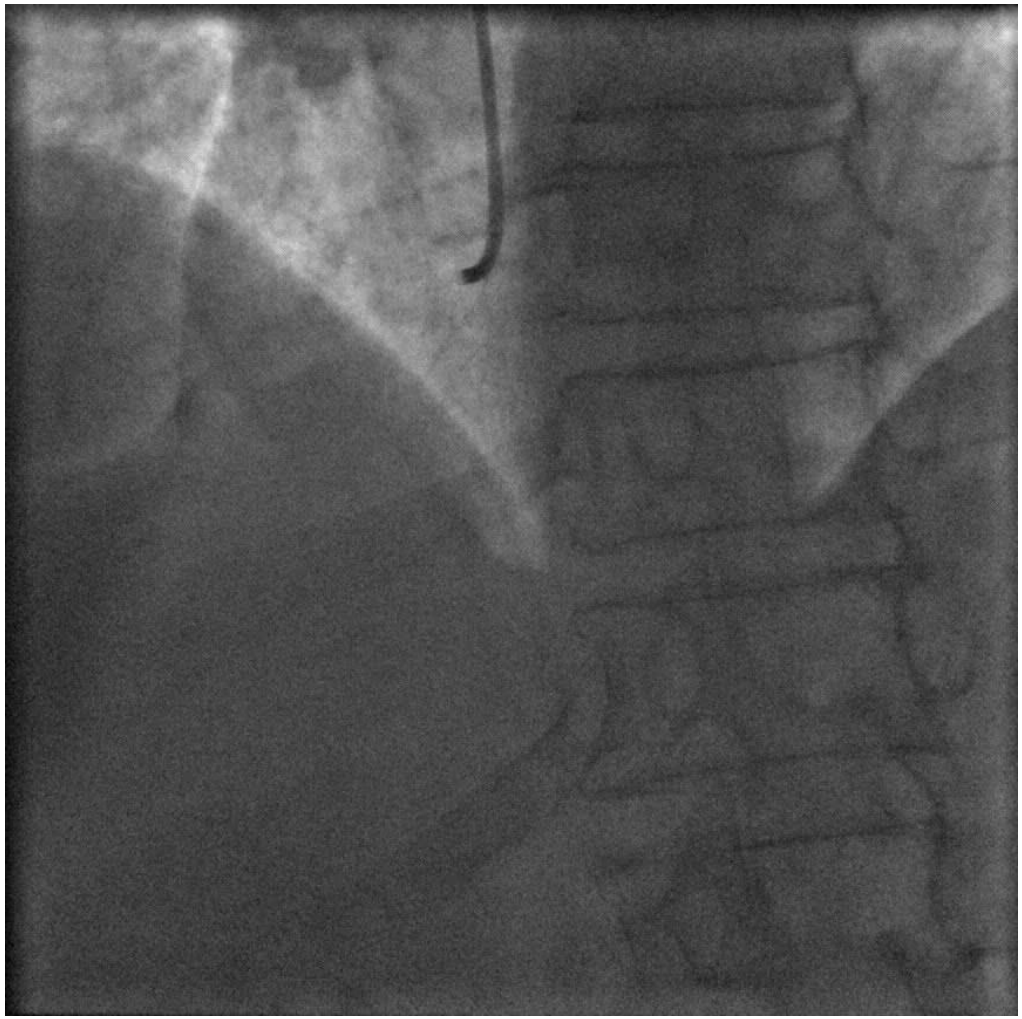
Ultimate future of malapposition at implant

114 cases with fully assessable paired OCT

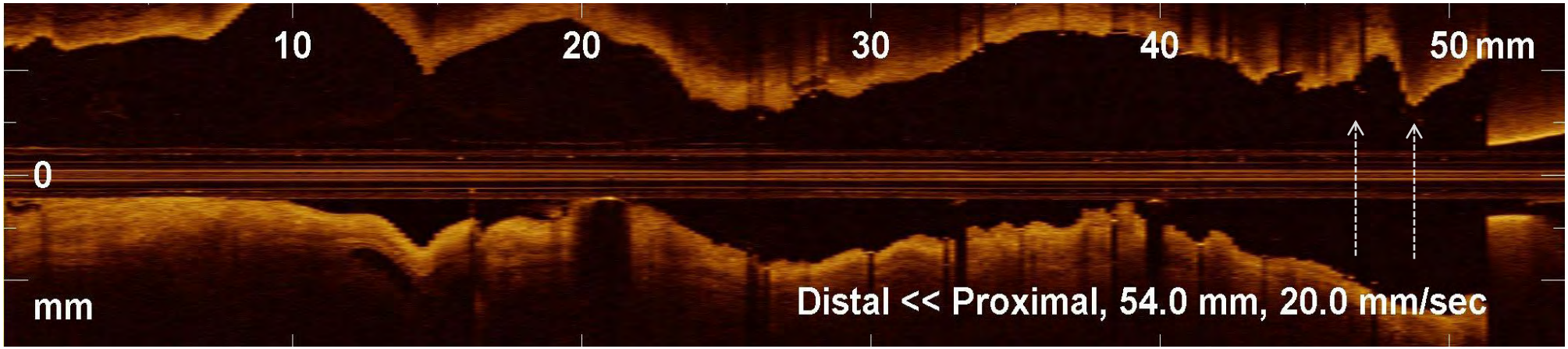


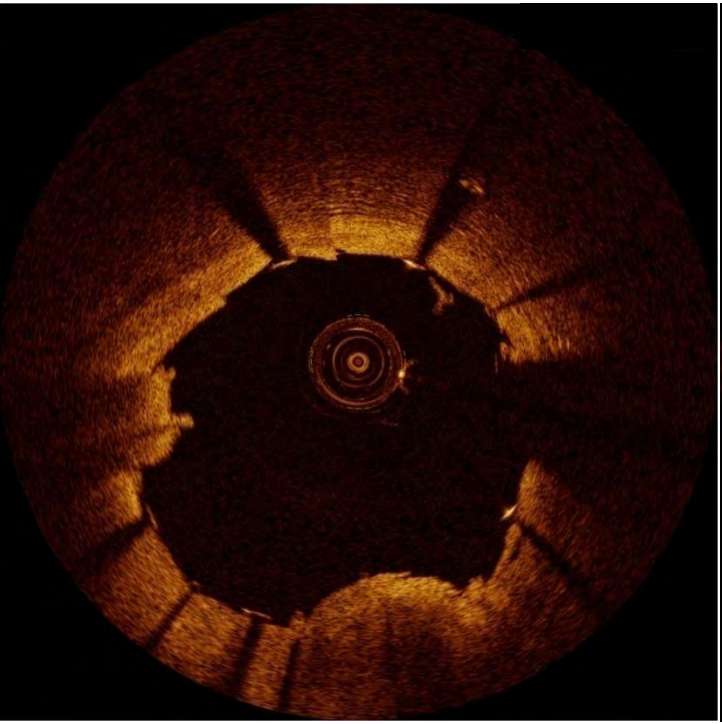
STEMI

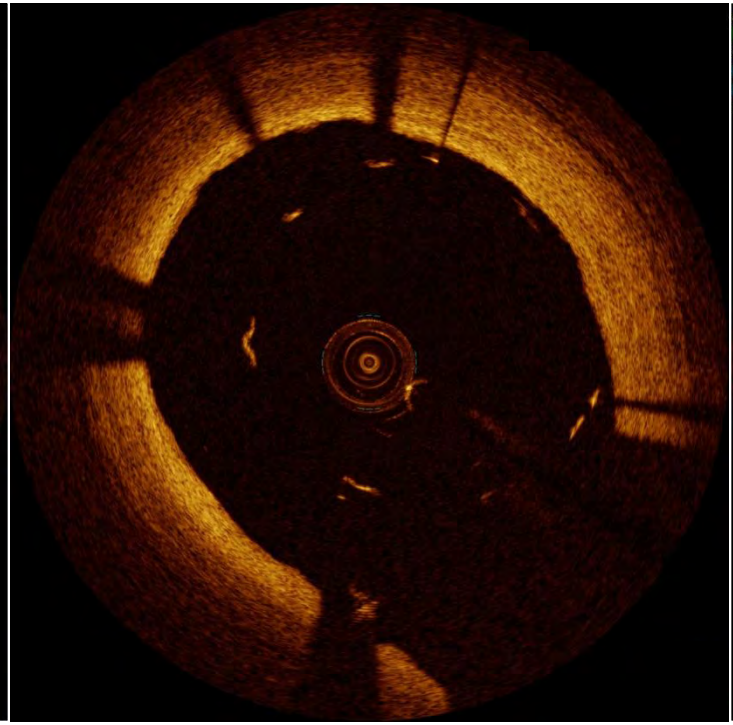
DES 3.5 28 mm, HP postdil

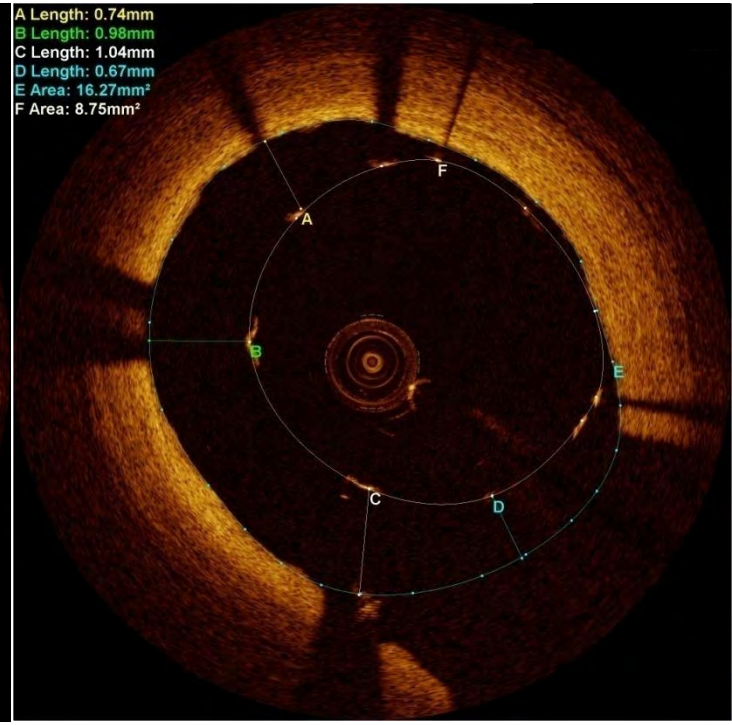


Long stented segment (and tapering) embodies higher risk of malapposition

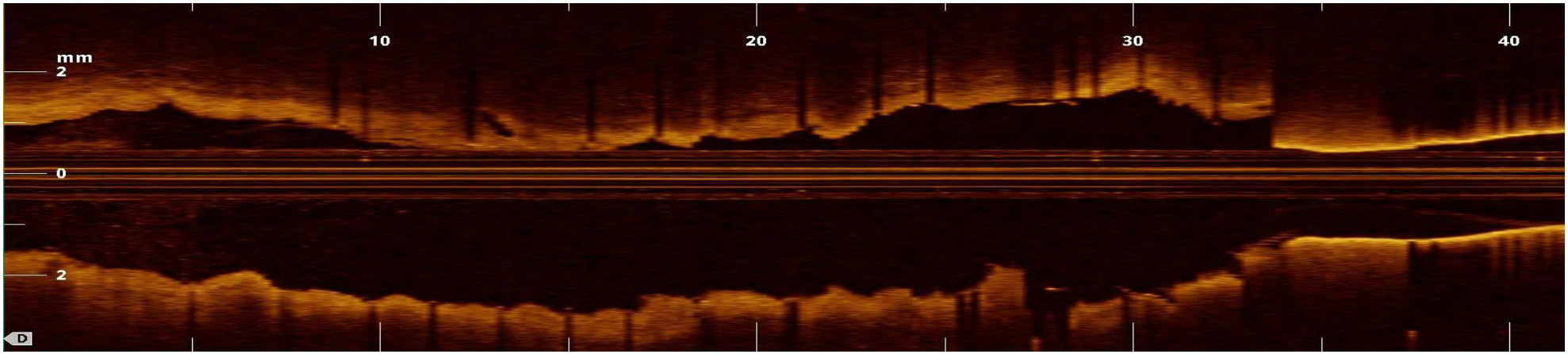


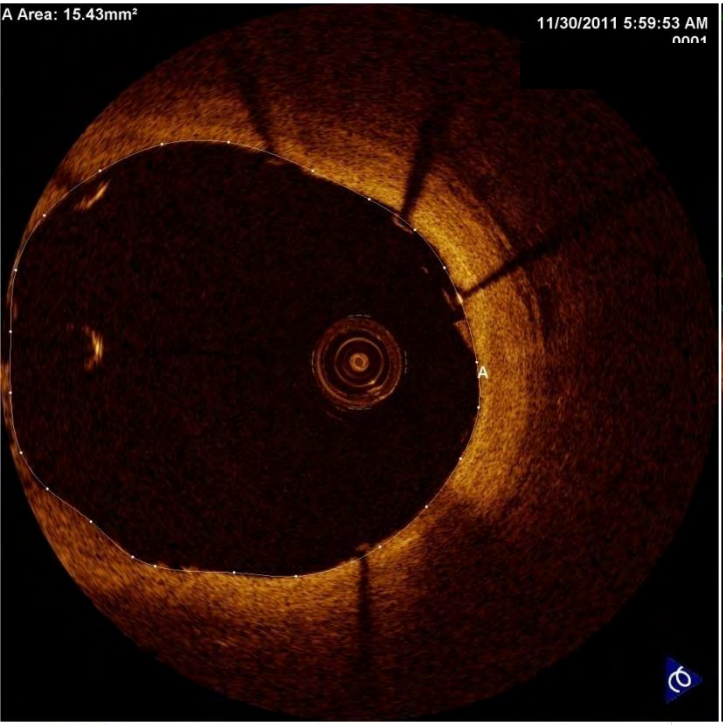


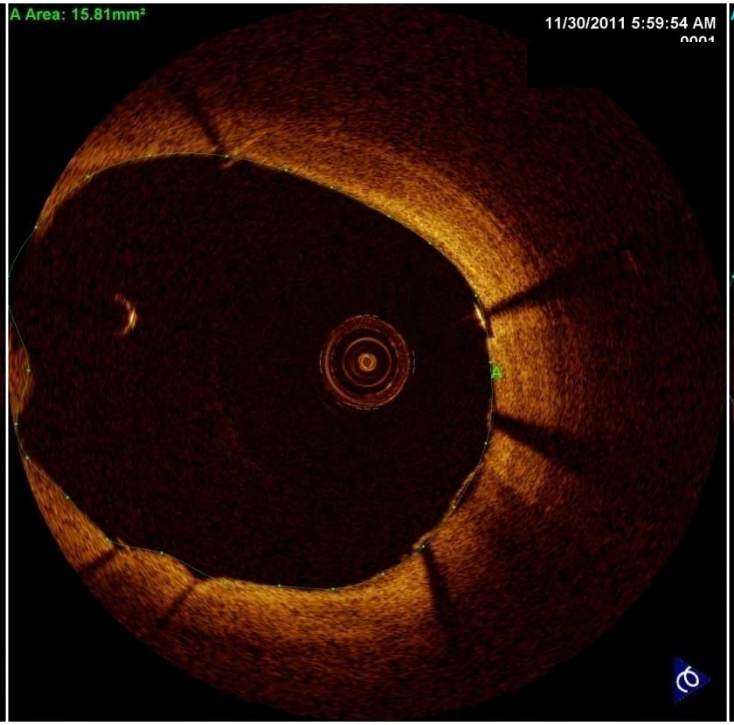


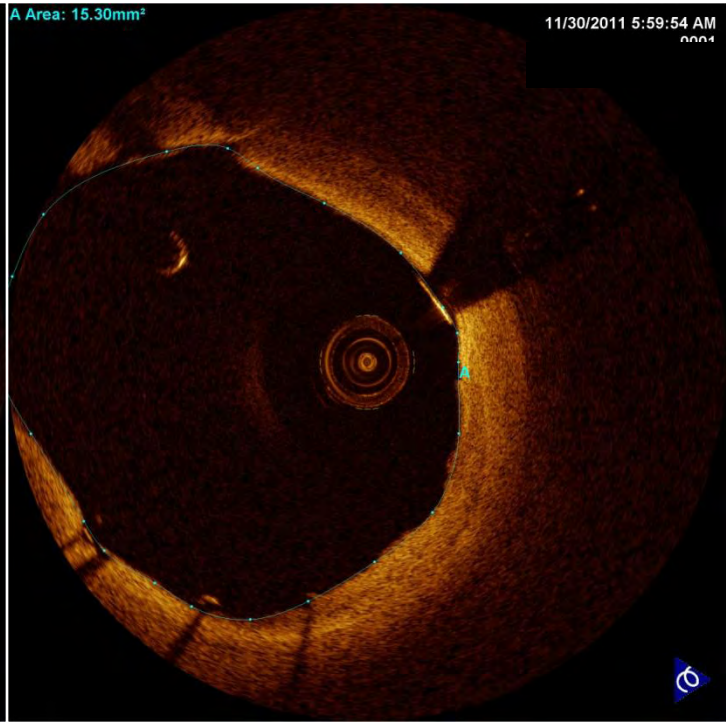


OCT guidance for stent optimization: ∅ 4.0 x 8mm balloon









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Bergamo

Sistema Sanitario Regione Lombardia

Conclusions: OCT in AMI provides practical insights at multiple times and levels (if used pre and post-intervention)

How to do it ?

- prompt location and number of culprit lesion (s) *(important for stent length)*, difference in position between MLA (tighest point in angio) and plaque rupture *(important to avoid geographical miss)*
- type of thrombus and completeness in removal - pharma + mechanical- and if no lumen ostructive lesion eventually to postpone (**Should I do? When ?)**
- Accurate assessment of landing zone for stenting (to avoid damage of TFCA at the edges, or large malapposition due to unknow vessel ectasia *(important to avoid geographical miss)*
- Post-stenting: precise measures of MCSA (underexpansion), edge dissection *(to be corrected only if longer than 4.3 mm),* and large segmental malapposition (especially at margins, with long stents and vessel tapering)
- Individual risk assessment based upon advanced and extent of lesions