

How Might **OCT** Have Improved Outcomes in **OCTOBER**?

Niels Ramsing Holm

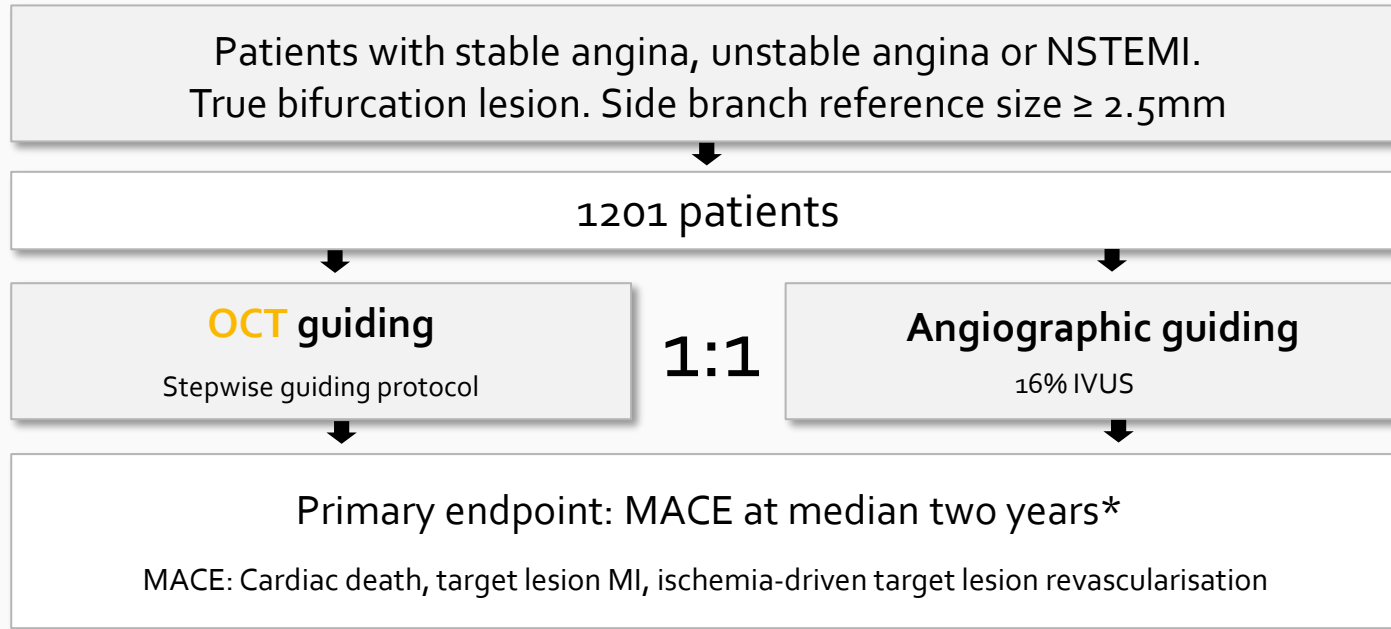
Dr. Lene Nyhus Andreasen contributed in preparation of this talk

On behalf of the **OCTOBER** trial investigators

Disclosures

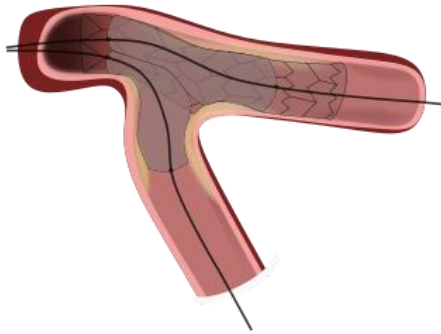
- Institutional research grants from Abbott, Biosensors, Boston Scientific, Medis medical imaging, Reva medical
- Speaker fees from Abbott, Terumo and Cardirad

OCTOBER trial overview

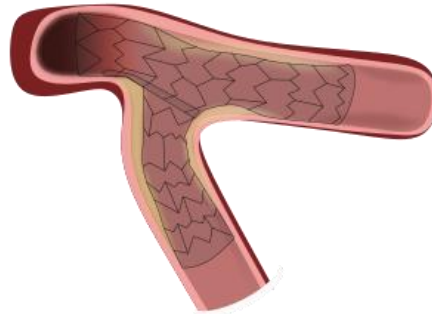


Bifurcation stent techniques in OCTOBER

35% and 36% had one-stent with KBI



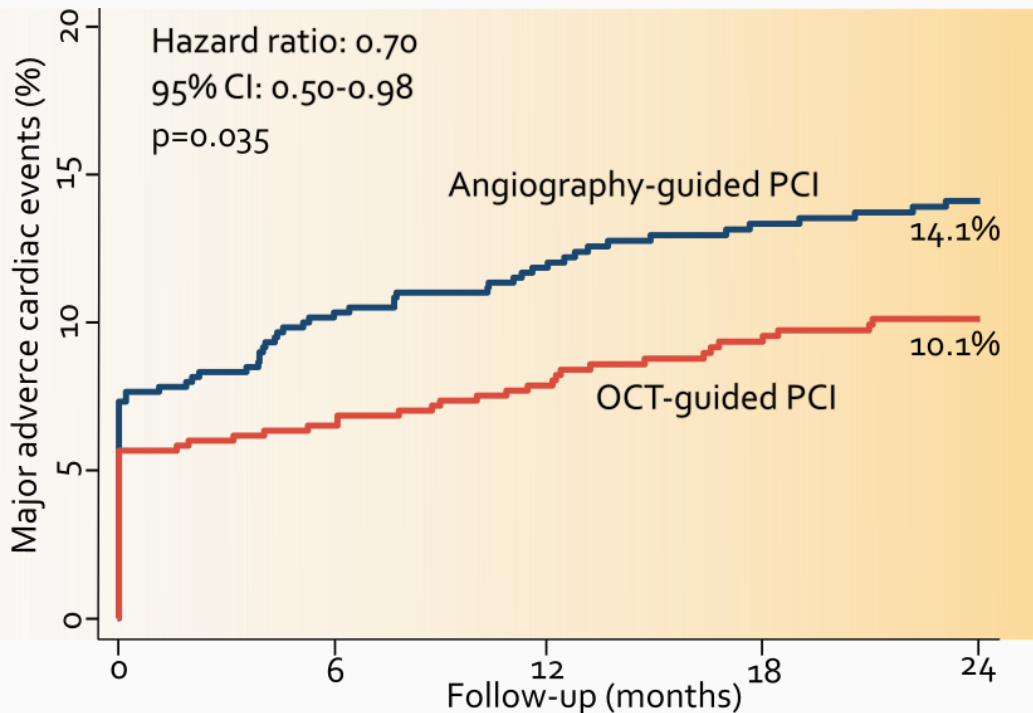
65% and 64% had a two-stent strategy



	OCT	Angio
▪ Culotte	43%	42%
▪ DK Crush	34%	38%
▪ TAP	13%	12%
▪ T-stent	9%	8%

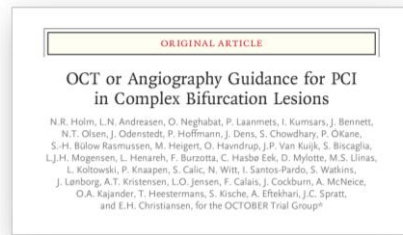
Holm et al NEJM 2023

Primary endpoint - MACE



30% RR reduction

The NEW ENGLAND
JOURNAL of MEDICINE



MACE: cardiac death, target lesion myocardial infarction, ischemia-driven target lesion revascularization

Kaplan Meier estimates

Comparison by unadjusted Cox analysis

Confirmed by adjusted Cox analysis

No. At Risk:

OCT-guided PCI	600	553	537	472	439
Angiography-guided PCI	601	534	509	452	408

OCT guiding: Five treatment goals



Optimal lesion coverage



No unintended stent deformation



Optimal stent expansion



No luminal masses



No stent malapposition?

Adapted from Holm NR et al., Am Heart J 2018

OCT protocol – Timing

1

Before stent implantation

Evaluation of plaque preparation
Landing zone
Stent sizing

2

After rewiring

Wire position
Accidental abluminal rewiring

3

Final result

Lesion coverage
Expansion
Apposition
Stent deformation
Luminal masses

Holm NR et al. Rational and design of the European randomized Optical Coherence Tomography Optimized Bifurcation Event Reduction Trial (OCTOBER), Am Heart J 2018

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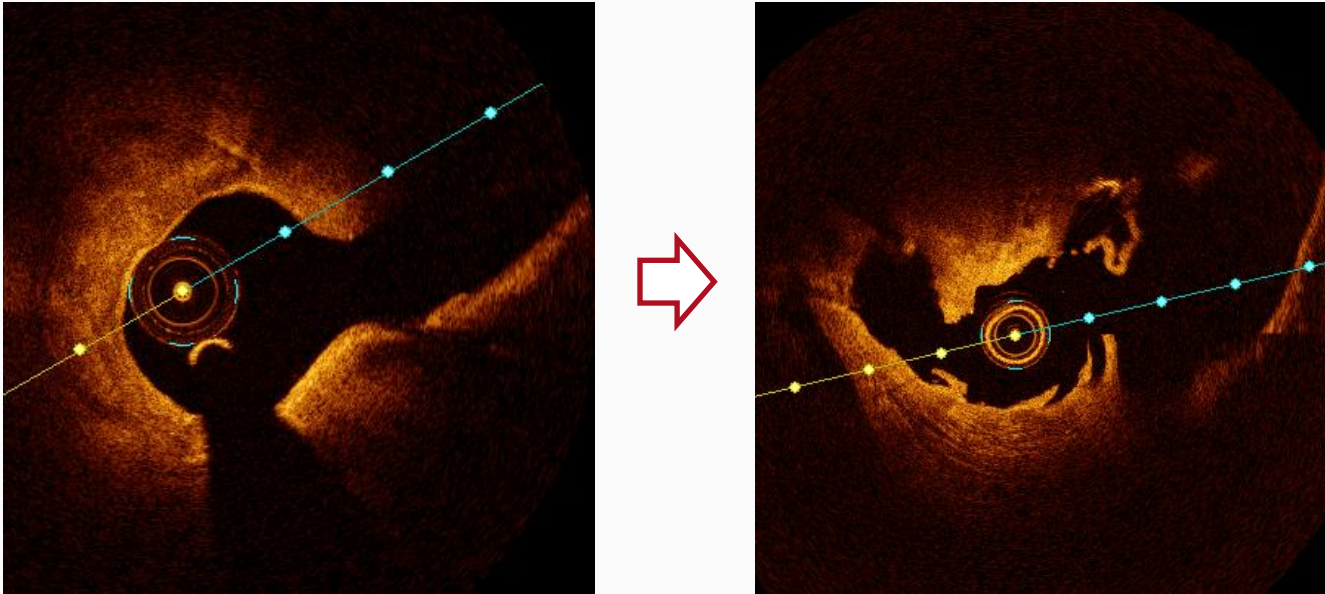
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1st OCT - after angio-guided plaque preparation



1/3 of cases needed more plaque preparation based on 1st OCT pullback.

Was actually performed in 43% of cases with indication

Jujo et al. International Journal of Cardiology 221 (2016)23–31
Fujino et al. EuroIntervention 2017

OCTOBER substudy
Neghabat et al in submission

OCT lesion coverage / stent length

Avoid leaving edges with:

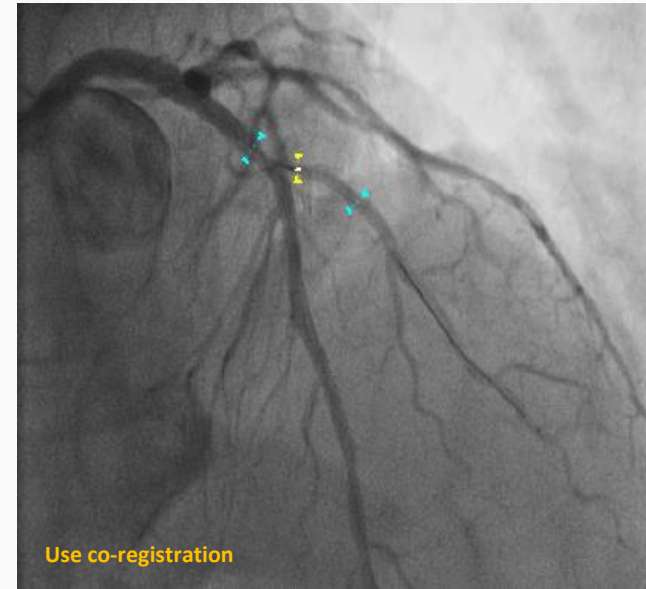
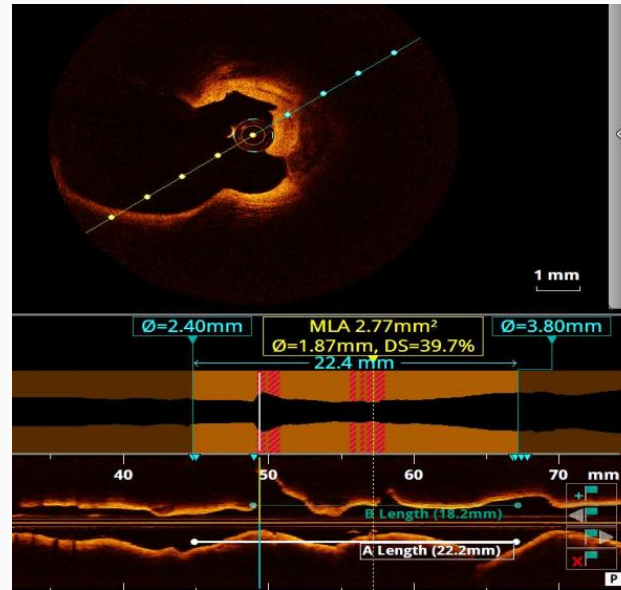
- Residual stenosis > 30% DS
- Major fibroatheroma
- Major dissections

Kang et al. AJC 2013

Fedele et al. AJC 2012

Prati et al. EuroIntervention 2012

Sheris et al. AHJ 2000



Reference size

Stent sizing

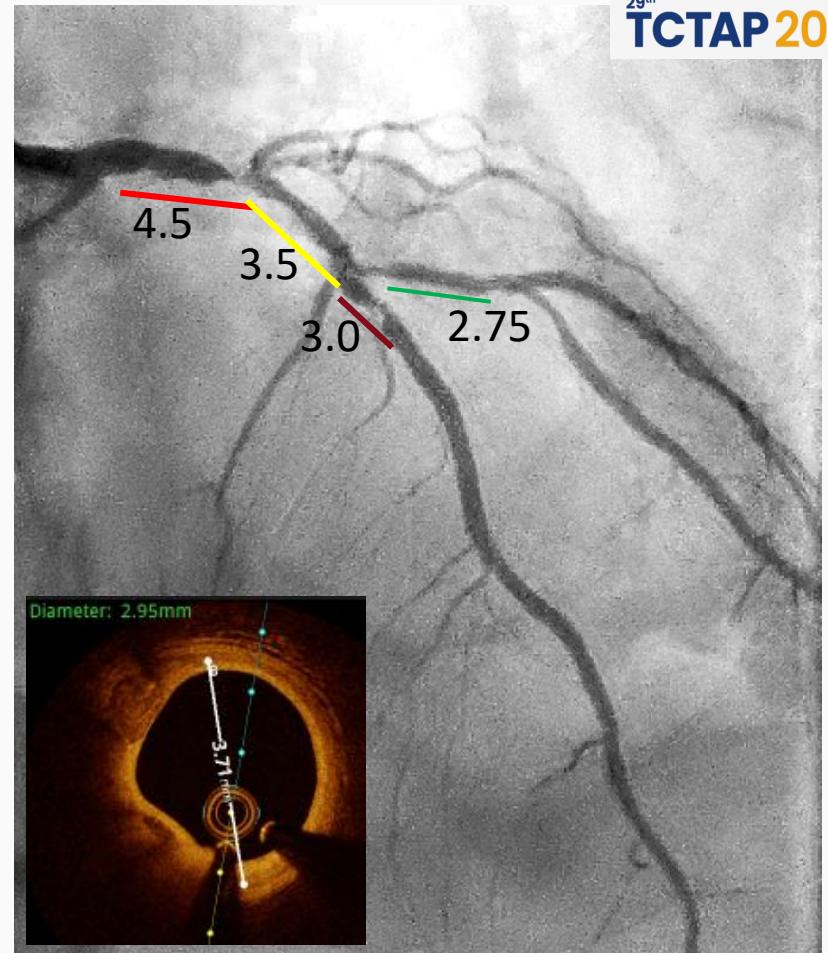
Ref diam was limit for largest balloon

Largest balloon

- OCT: 4.2 ± 0.03 mm
- Angio: 4.0 ± 0.02 mm

Perforations

- OCT: 0.8%
- Angio: 1.0%



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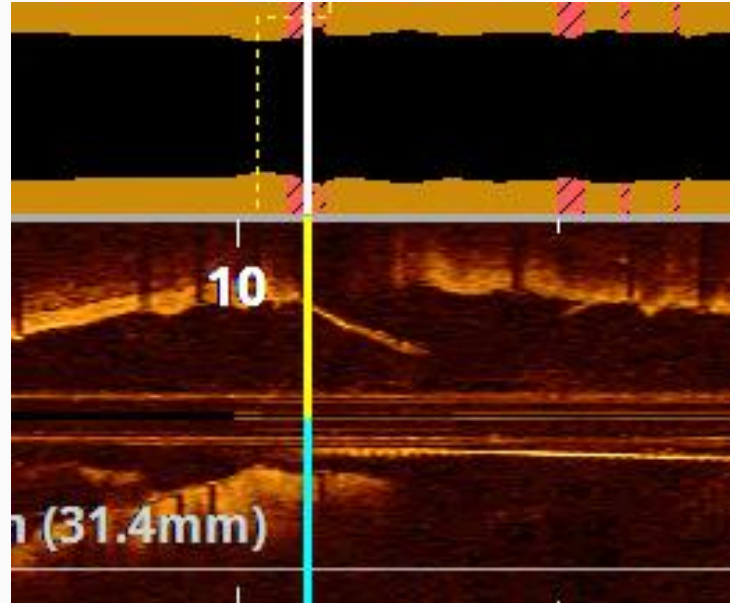
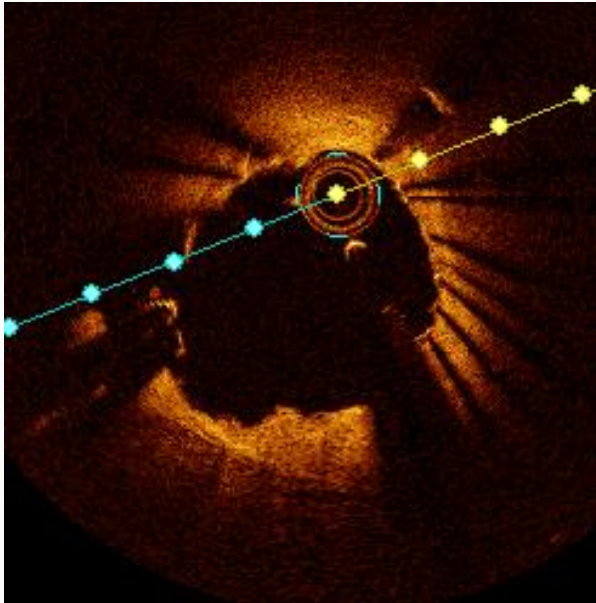
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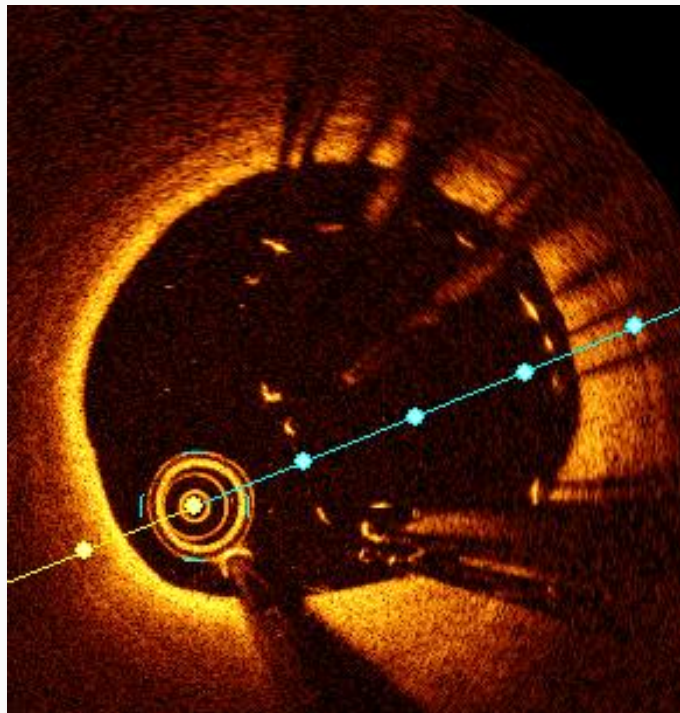
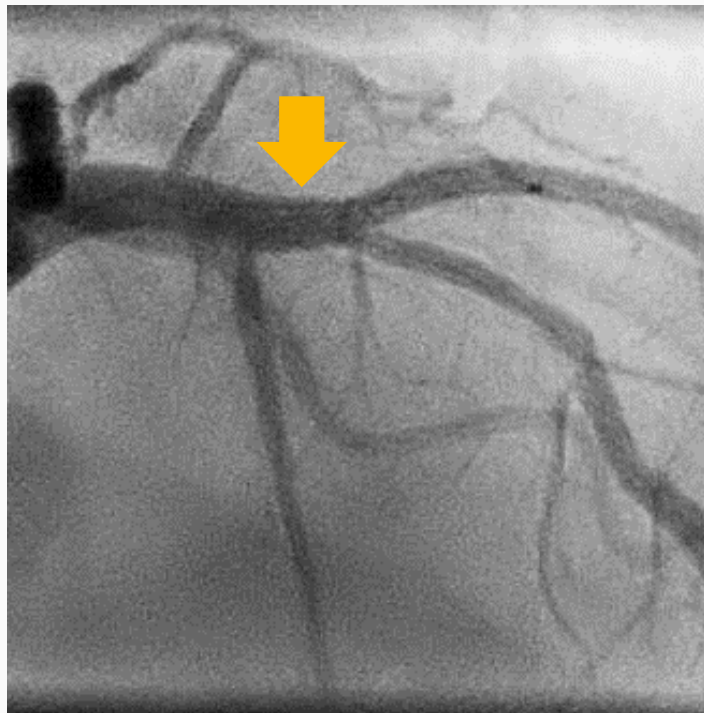
Avoid proximal rewiring



Foin et al. Int J Card 2013
Alegria-Barrero et al. EuroIntv 2012
Foin et al. Circ J 2012
Viceconte N et al. CCI 2012
Holm et al EuroIntv 2011
Okamura et al EuroIntv 2014

Using 75 mm highspeed pullback to save contrast – 3D required 54mm pullback (optional)

Accidental abluminal rewiring

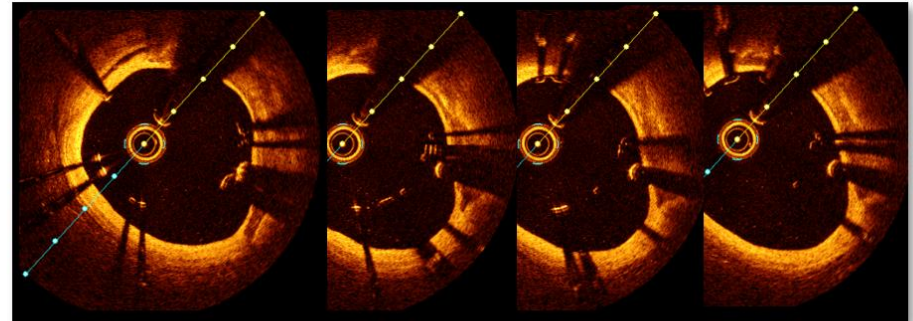
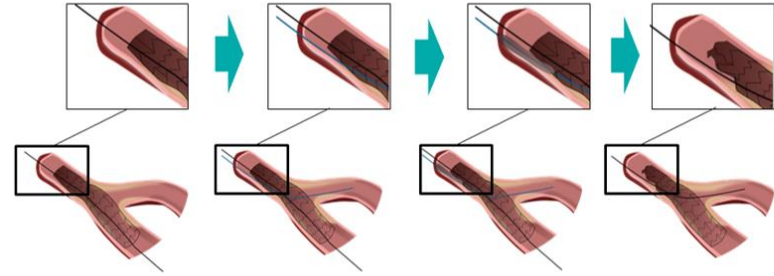


Würtz et al. Int J Card 2015
Abdou et al. CCI 2011
Zhang et al Chin Med J 2009

Accidental abluminal rewiring

	No. total cases (%)
Abluminal rewiring	32/589 (5.4%)
- After 1st stent	19/521*
- After 2nd stent	14/268*
Cases with ≥ 1 incidence	1/589 (0.2%)
Seen and corrected during procedure	18/33 (54.5%)
Unnoticed during procedure	15/33 (45.5%)

*Total number of cases available for wire evaluation



Andreasen et al. 2023. In review

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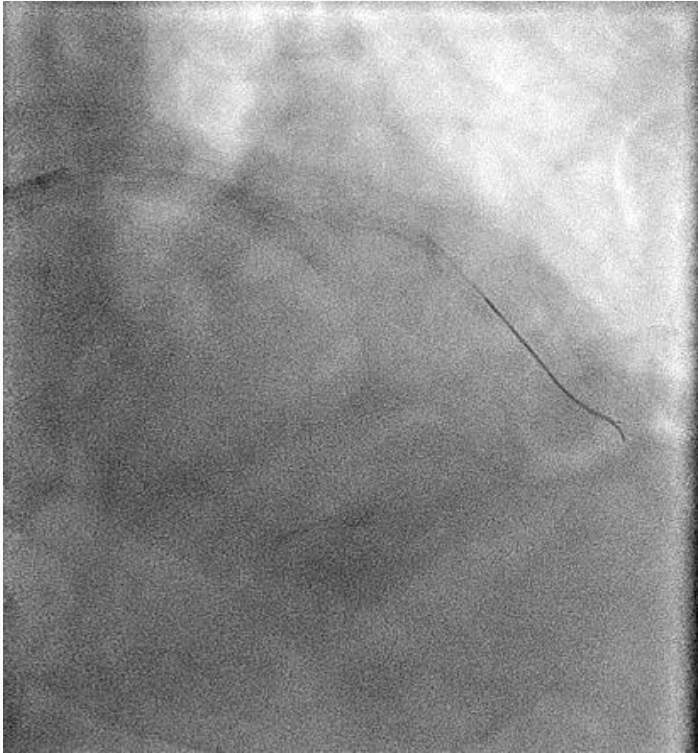
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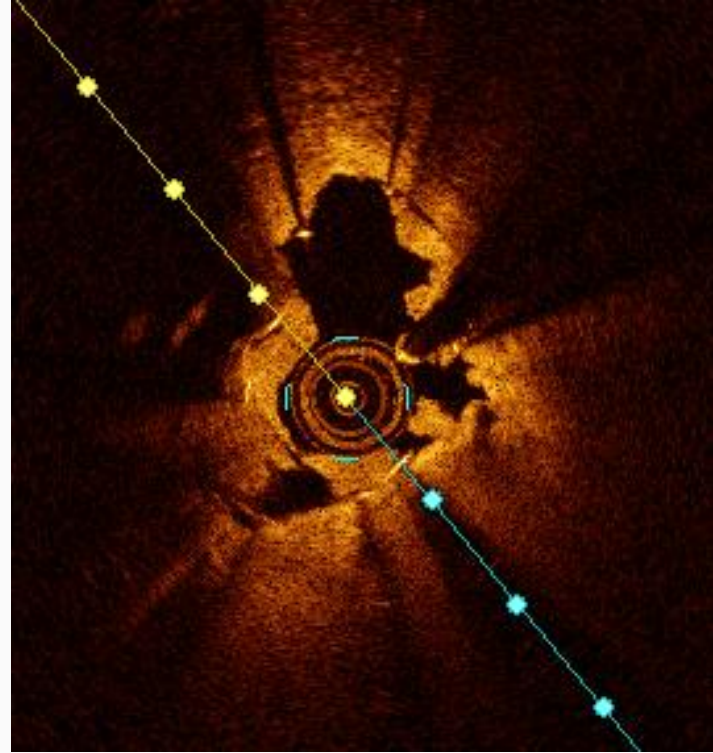
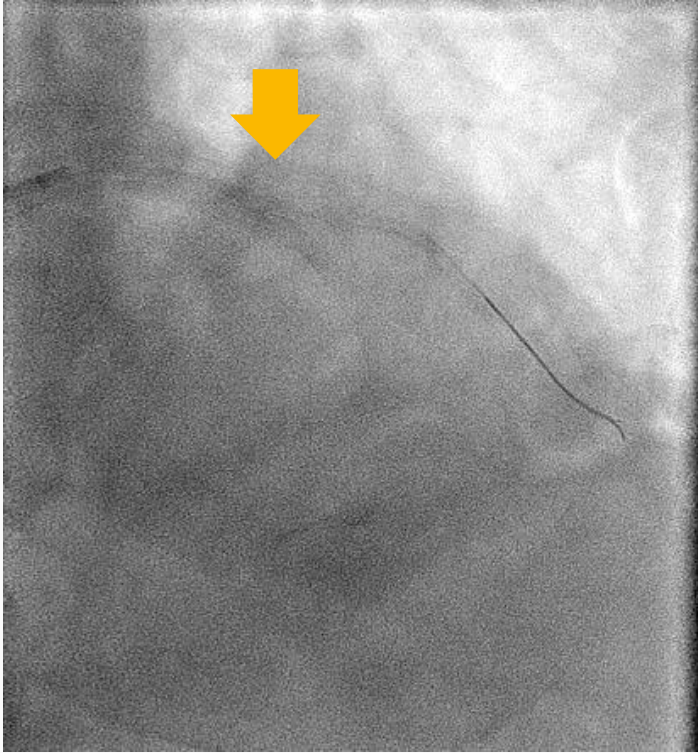
Holm NR et al. Rational and design of the European randomized Optical Coherence Tomography Optimized Bifurcation Event Reduction Trial (OCTOBER), Am Heart J 2018

The patient leaves the cathlab with the “Final result”



Case: OCTOBER trial

The patient leaves the cathlab with the “Final result”



Case: OCTOBER trial

Edge segments

Avoid leaving edges with:

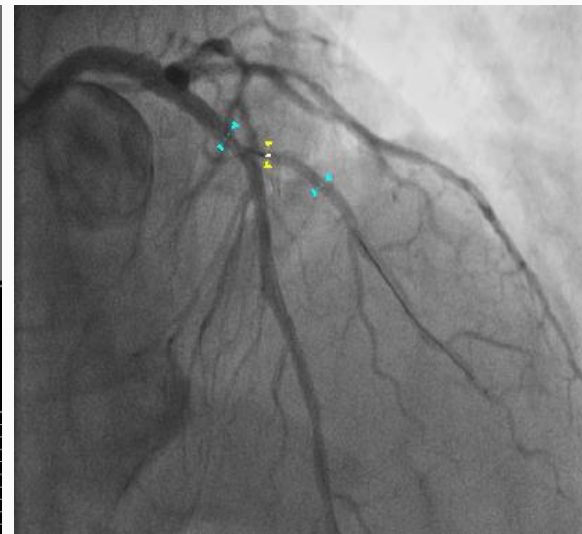
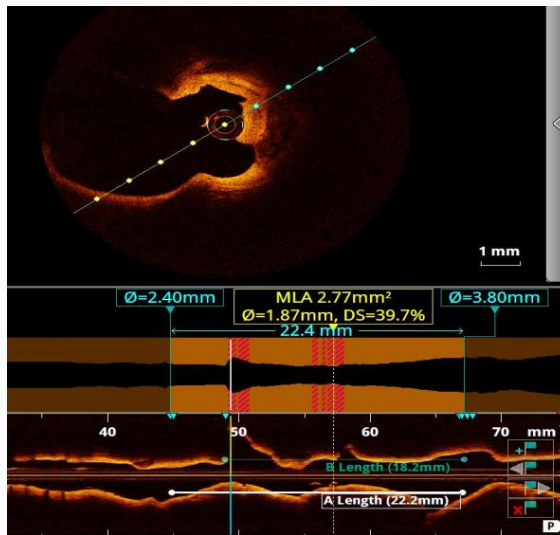
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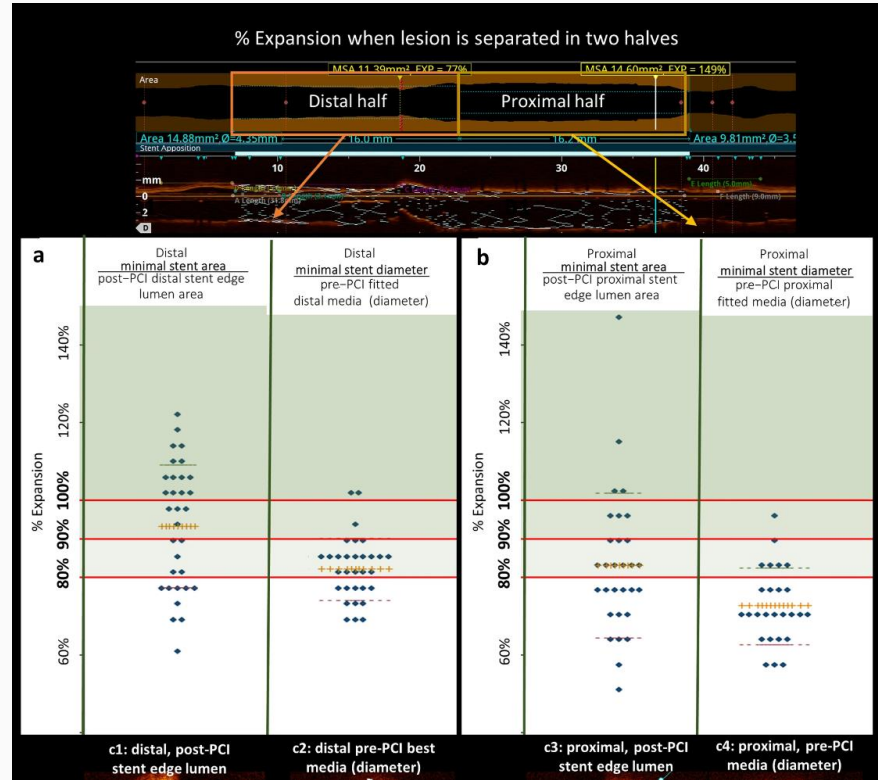
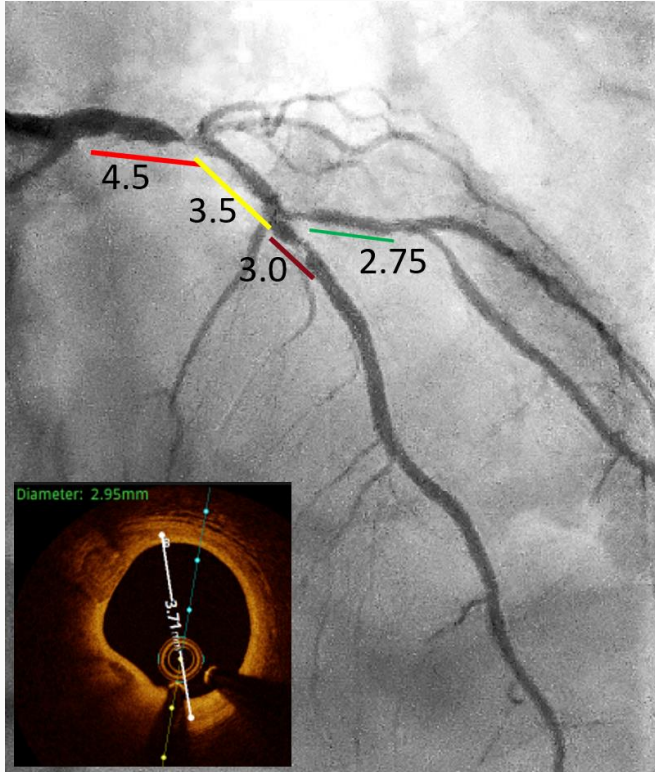
All edges (5mm) evaluated by OCT

One-stent technique: 78%

Two-stent techniques: 45%

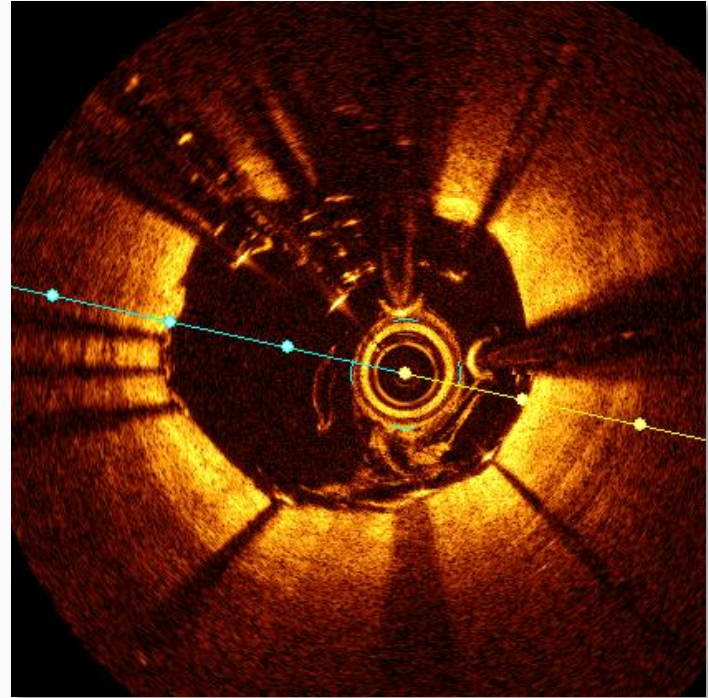
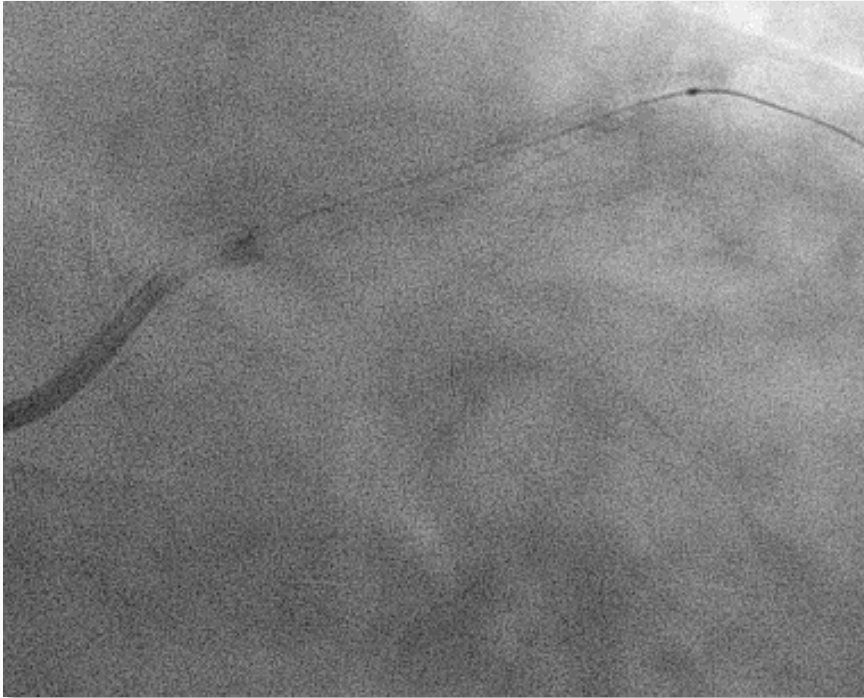
Only 2 (0.3%) angio-verified events in OCT evaluated edges

Stent expansion



Andreasen et al. Int J Card Img 2023

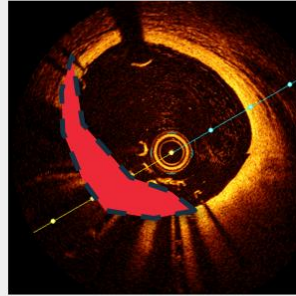
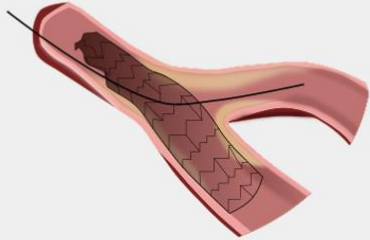
Unintended stent deformation



Andreasen et al. 2024. Accepted JACC Interv.

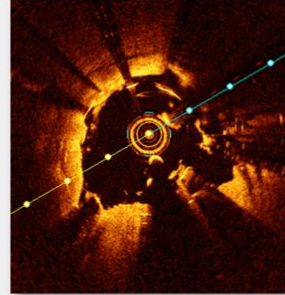
Mechanisms of USD

Abluminal rewiring



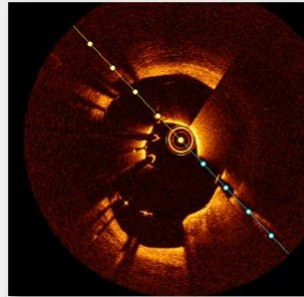
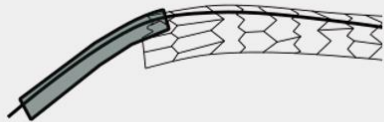
24/55 (44%)

Fractured wire



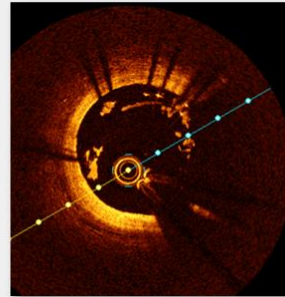
2/55 (3.6%)

Guide catheter collision



20/55 (40%)

Uncertain mechanism



9/55 (16.4%)

Andreasen et al. 2024. Accepted JACC Interv.

Clinical outcomes

- Two-year MACE occurred in 7 of 30 untreated USD cases

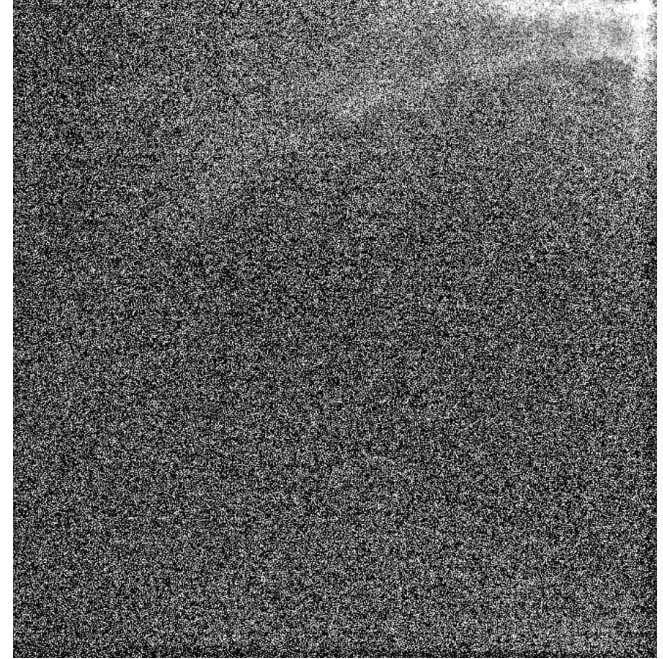
n=589

USD left untreated (n=30)	No USD or unknown (n=559)	Log Rank
23.3%	9.4%	0.007

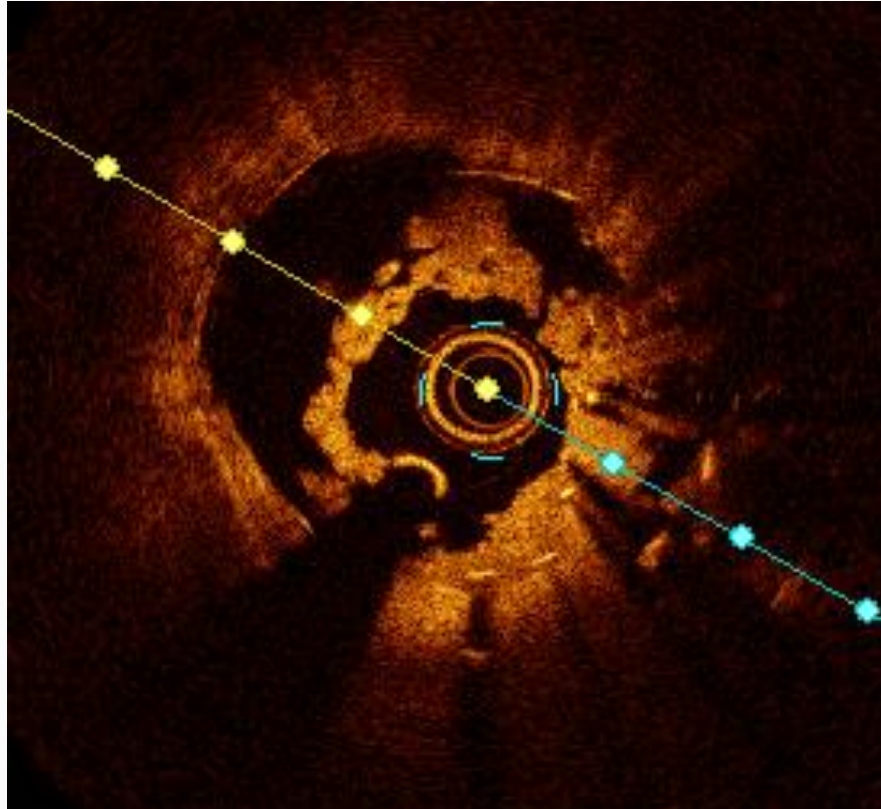
n=55

USD left untreated (n=30)	Treated or unknown final USD (n=25)	Log Rank
23.3%	0.0%	0.014

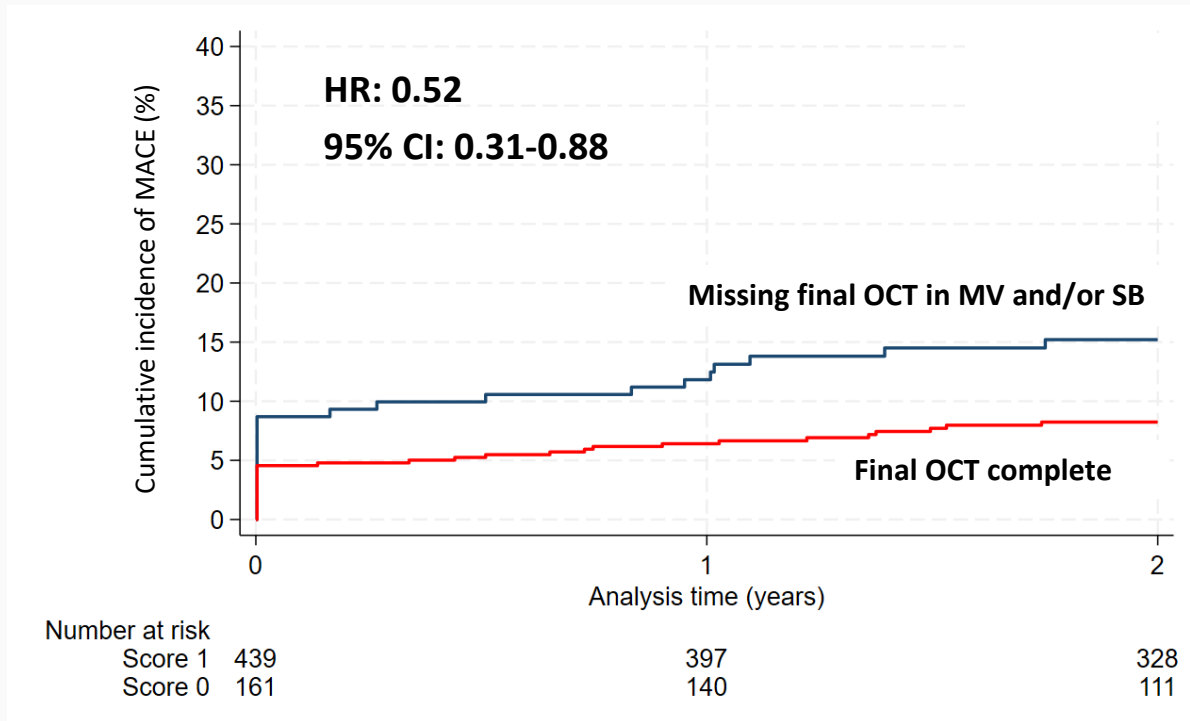
Andreasen et al. 2023. In review



Intraluminal masses



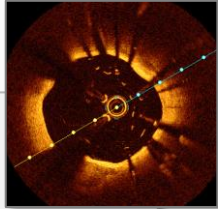
Importance of the final OCT pullback



Neghabat et al TCT2023

Final OCT was mandatory in MV for provisional one-stent technique, and in both MV and SB for all two-stent techniques

Conclusion



- Routine OCT guiding improved clinical outcome after bifurcation PCI
- Physicians reacted adequately to roughly half of actionable OCT findings in OCTOBER. The actions were enough for a positive trial, but full potential of OCT remain to be shown
- Unintended stent deformation (USD) was associated with higher MACE. Corrected USD -> offset increased risk
- Performing final OCT in all treated segments - including edges – appears to be very important