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Multiple Options for Distal Bed: Stent-DCB-POBA or No treatment?

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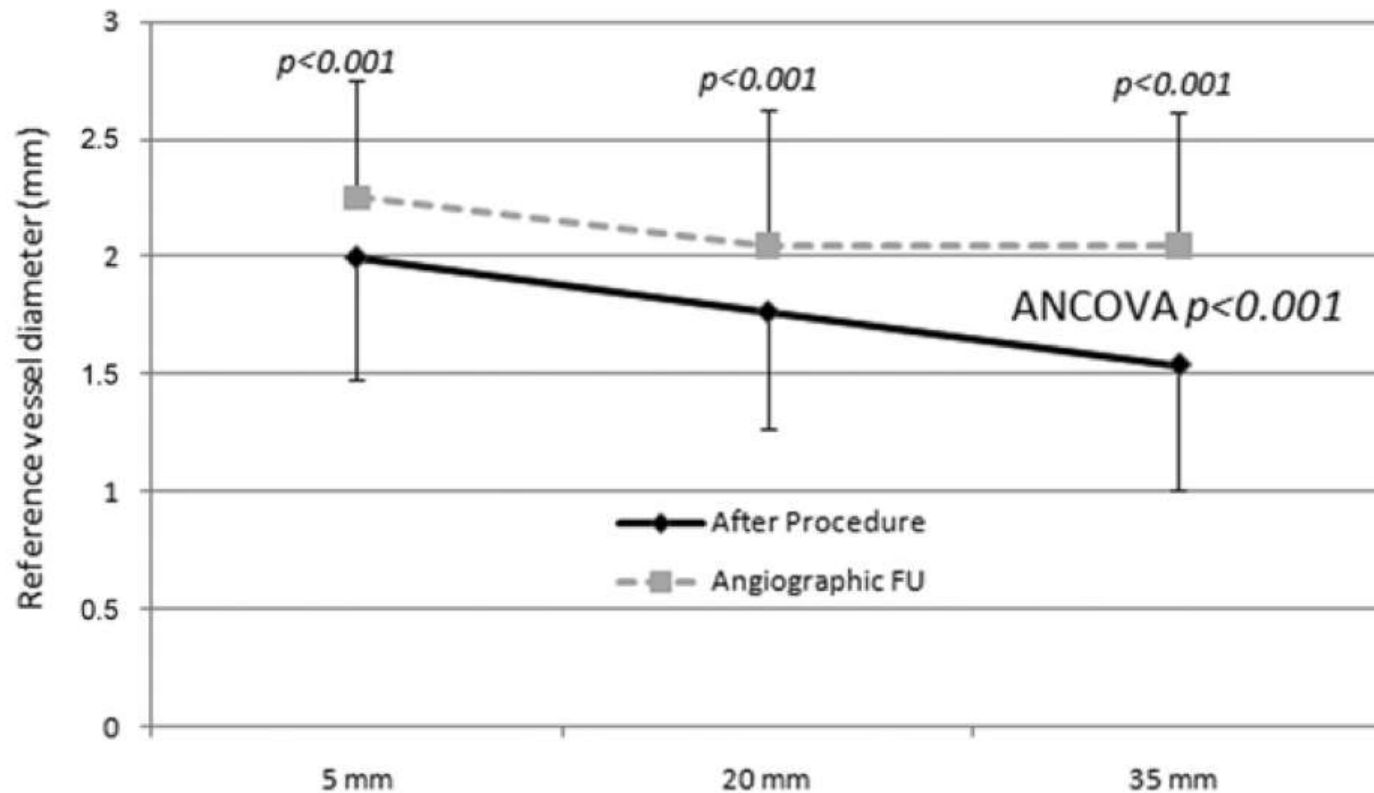
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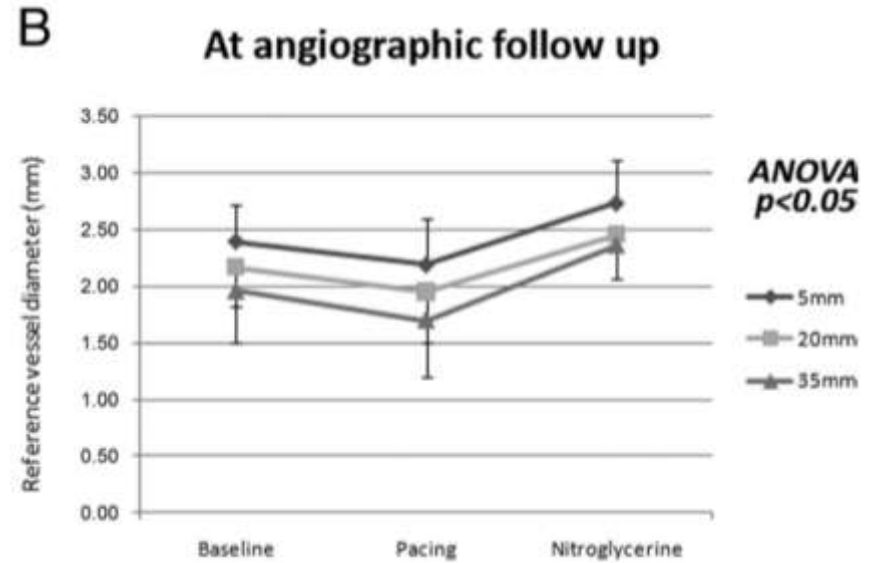
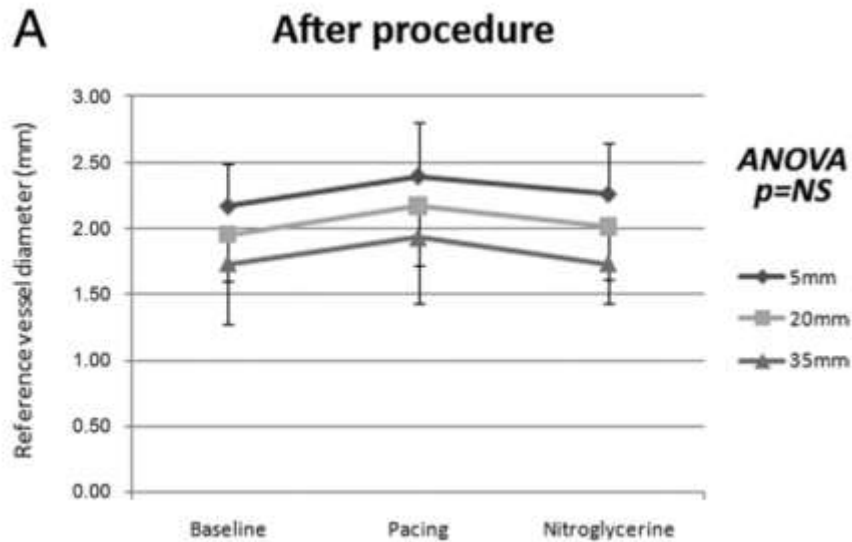
Director of CTO and CHIP

Distal Vessel Diameter Increases over Time 9-12 mo FU



Recanalization of CTO is followed by a hibernation of vascular wall at distal coronary segments that fail to respond to endothelium-dependent and -independent stimuli.

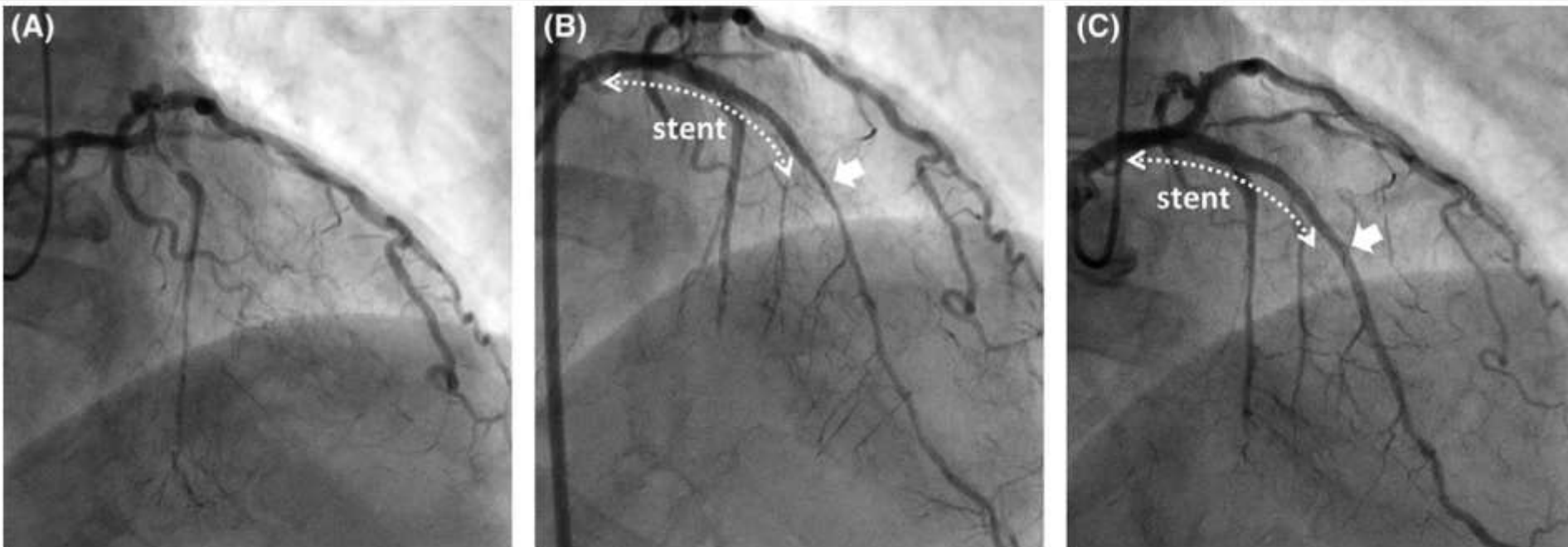
Distal Vessel Response to Nitrates



Nitrates response after FU suggest recovery of “noncontractile” smooth muscle into the intima, whereas atrial pacing, suggest persistent endothelial dysfunction

Correlates of Distal Vessel Enlargement

134 pts with IVUS-guided CTO PCI, FU 10mo
Distal Vessel enlarged by 15.9% (2.06mm to 2.30mm)



Correlates were LAD target, no mod/severe calcification, small distal reference lumen diameter

Post CTO FFR and Distal Lumen Diameter Increases over Time

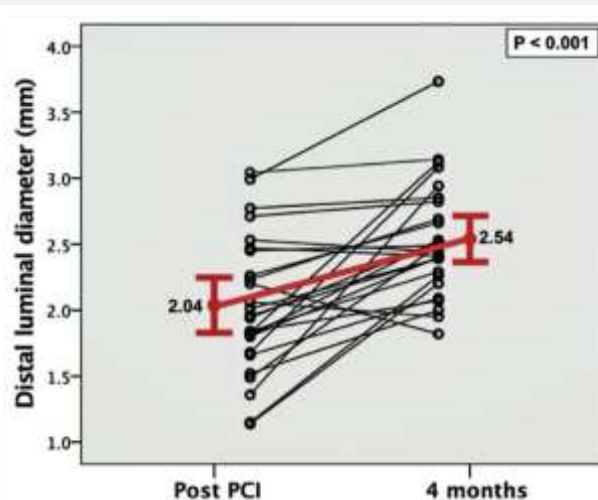
26 CTO-PCI of RCA



Post FFR after
procedure



Post FFR after 4
months follow up

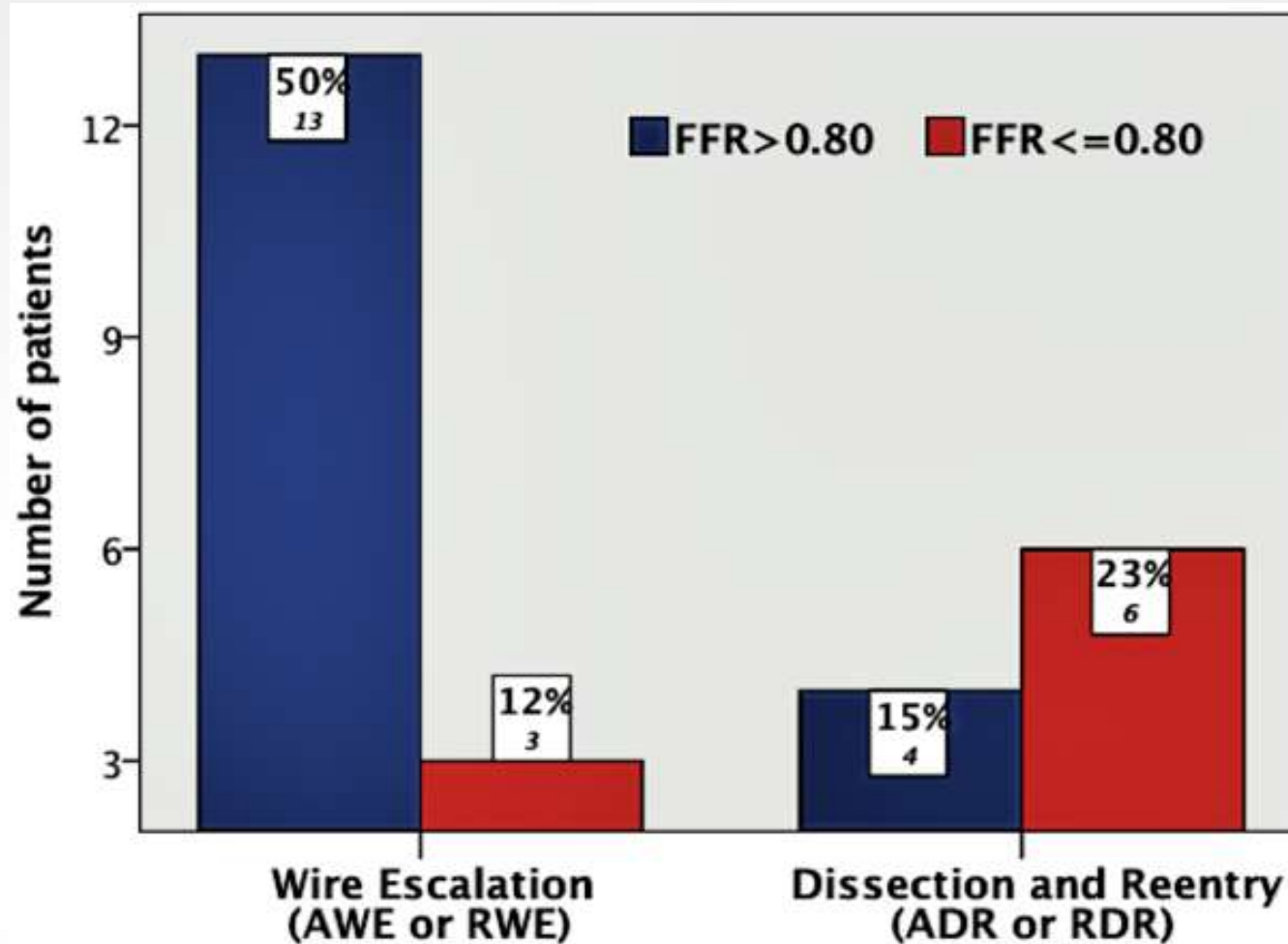


FFR: 0.82 ± 0.10

FFR: 0.89 ± 0.07

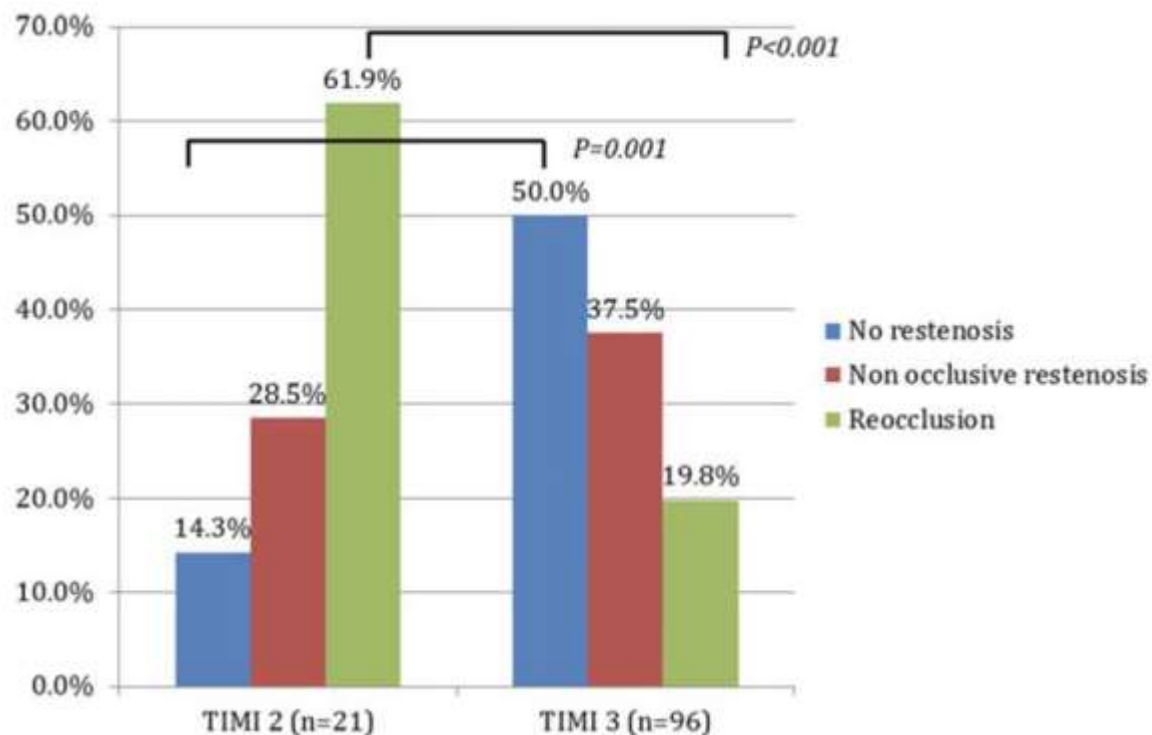
- After successful CTO recanalization, FFR was < 0.90 in the majority of the cases and remained ≤ 0.80 in a third of the patients.
- Substantial increase of FFR at 4-month follow-up, accompanied by significant increase in distal vessel size and regression of the collateral circulation.
- At 4-month follow-up, 42.3% of the patients still had an FFR < 0.90 .

FFR ≤ 0.80 more frequent with subintimal vs. luminal wiring

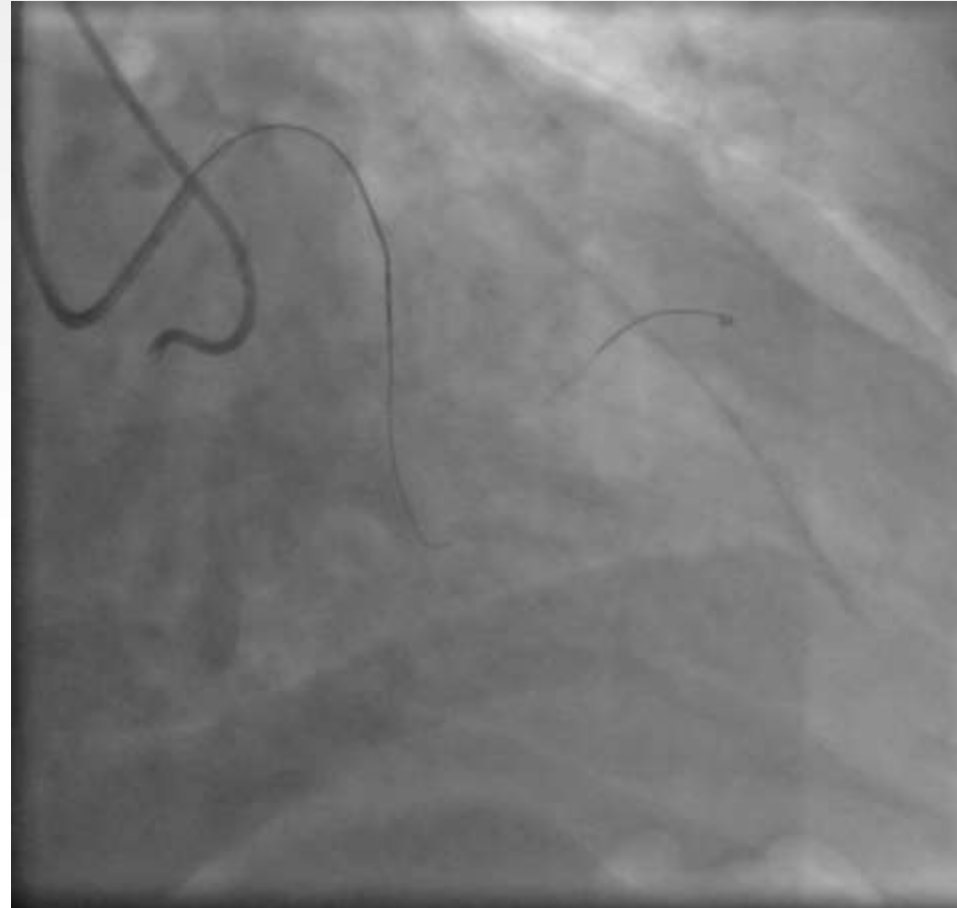
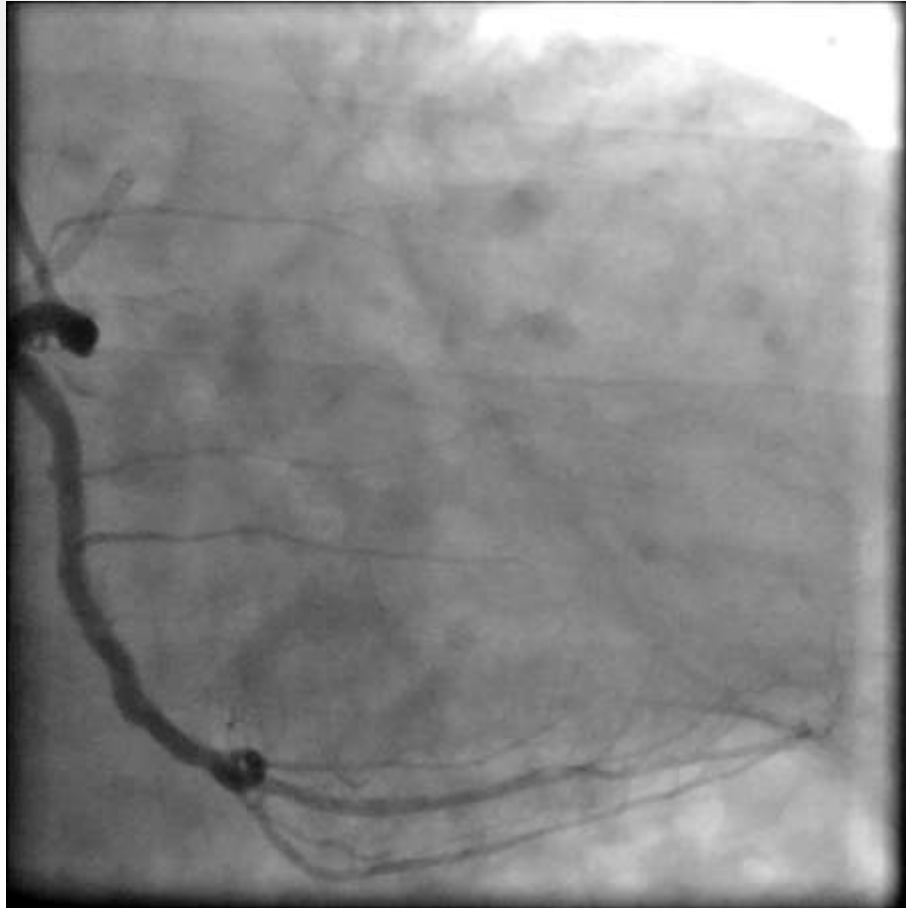


TIMI Flow Predicts Reocclusion and Re-Stenosis after CTO PCI

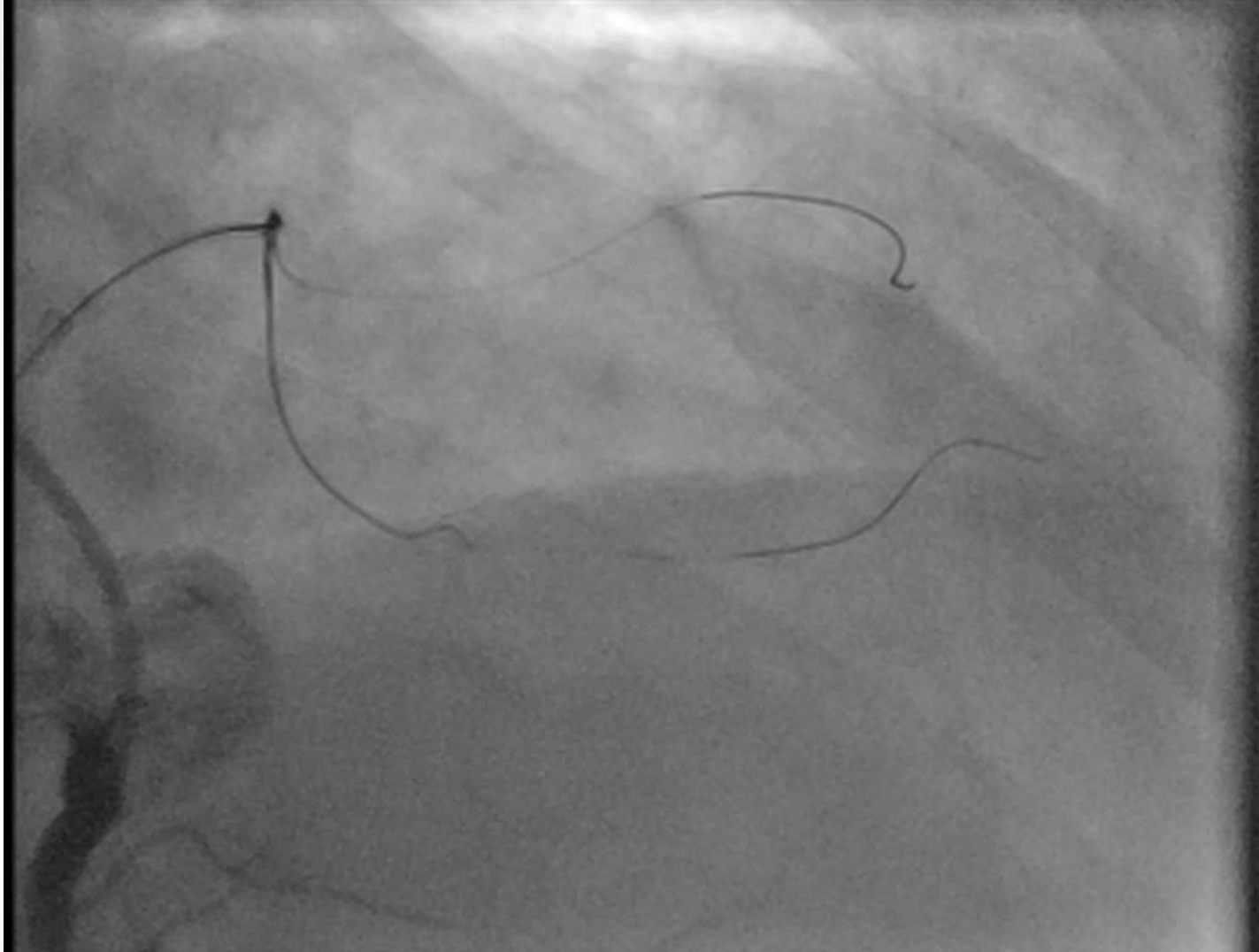
119 lesions treated with DES following STAR,
75 restenoses were observed (63.0%)



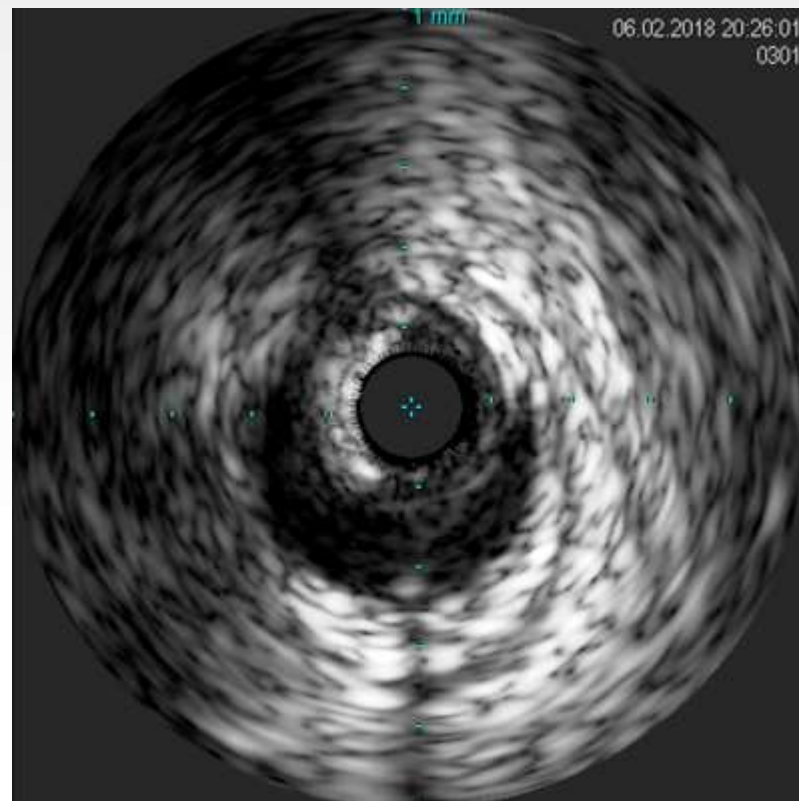
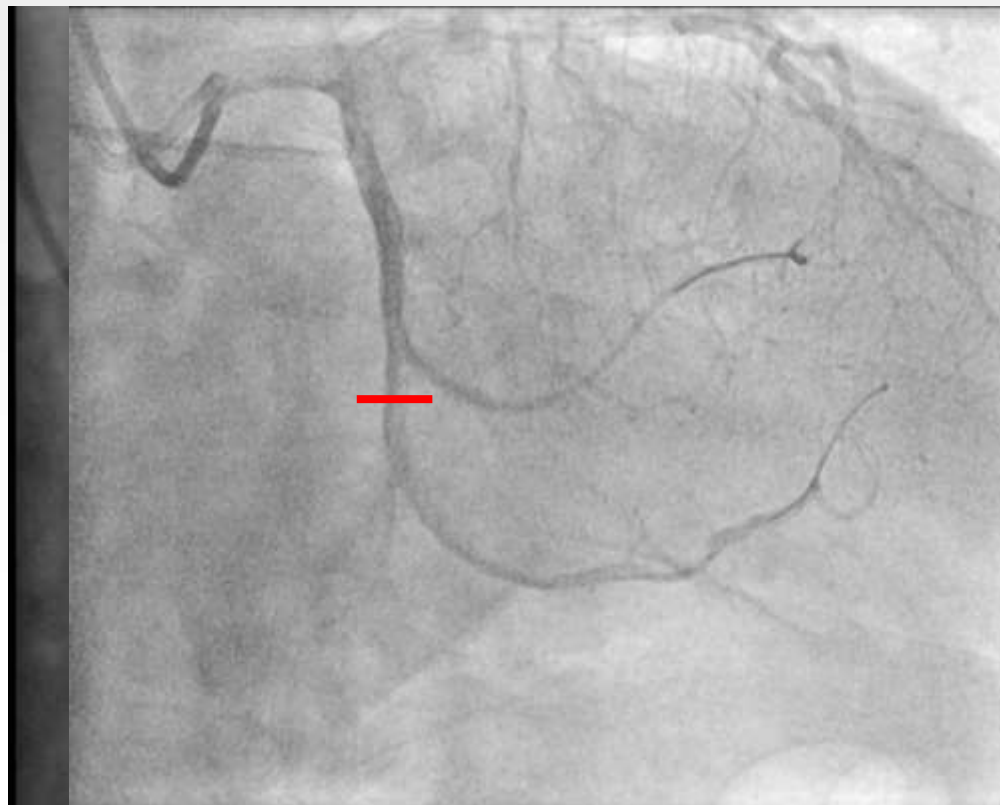
RCX CTO with Distal Dissection



RCX CTO with Distal Dissection

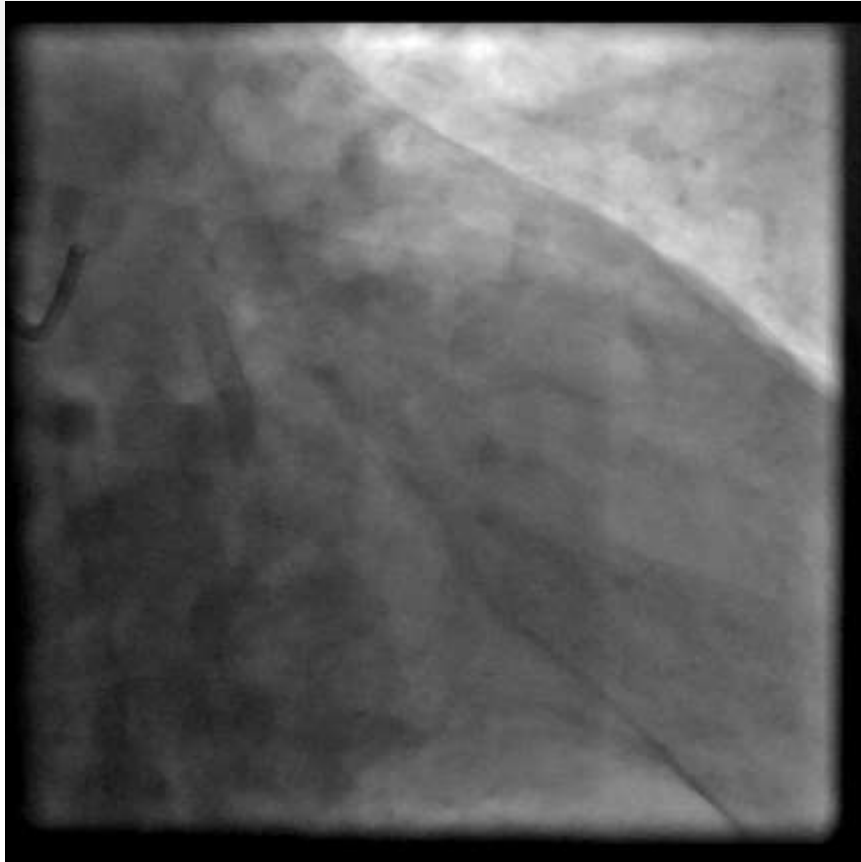


RCX CTO with Distal Dissection

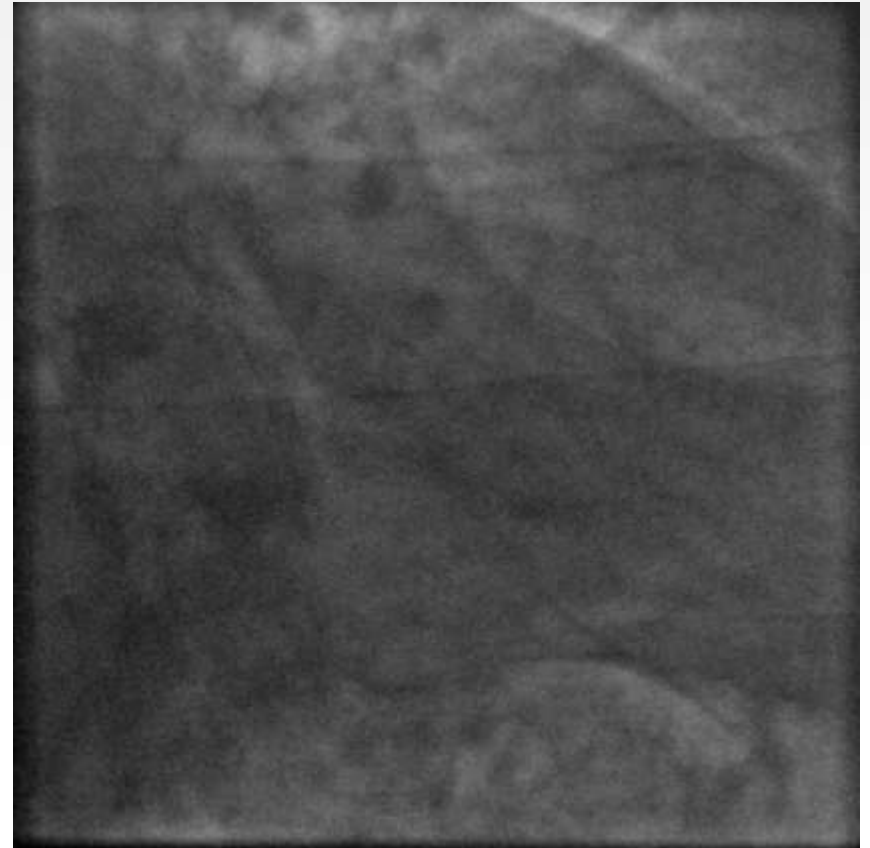


RCX CTO with Distal Dissection

Post CTO PCI



12 mo FU



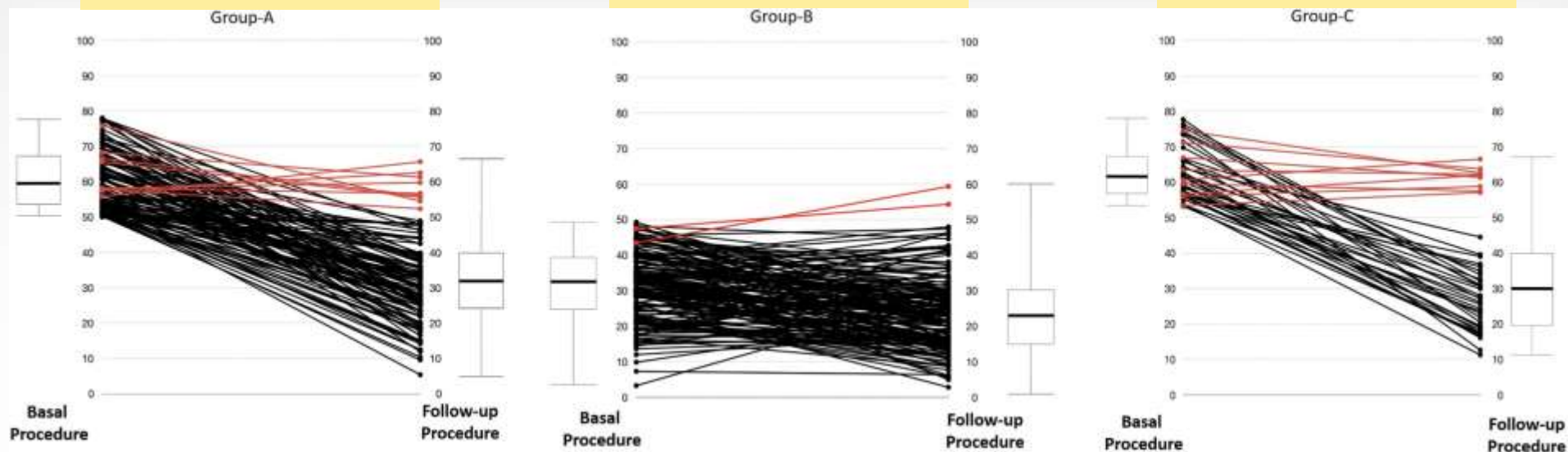
What to Do with Distal Vessel Stenosis after CTO PCI: PRISON III and IV:

Analysis of distal vessel based upon whether treated or left alone
355 pts analyzed; FU 8-12 mo

Not Treated

No Stenosis

Stented



Distribution of Percentage Diameter Stenosis in the 3 Study Groups

Stented pts had higher rates of TVR compared with non-treated
(18% vs. 8%, $p=0.08$), driven by ISR

Full Metal Jacket Stenting in CTO

1126 pts, 36,7% underwent FML (stent length >60mm)

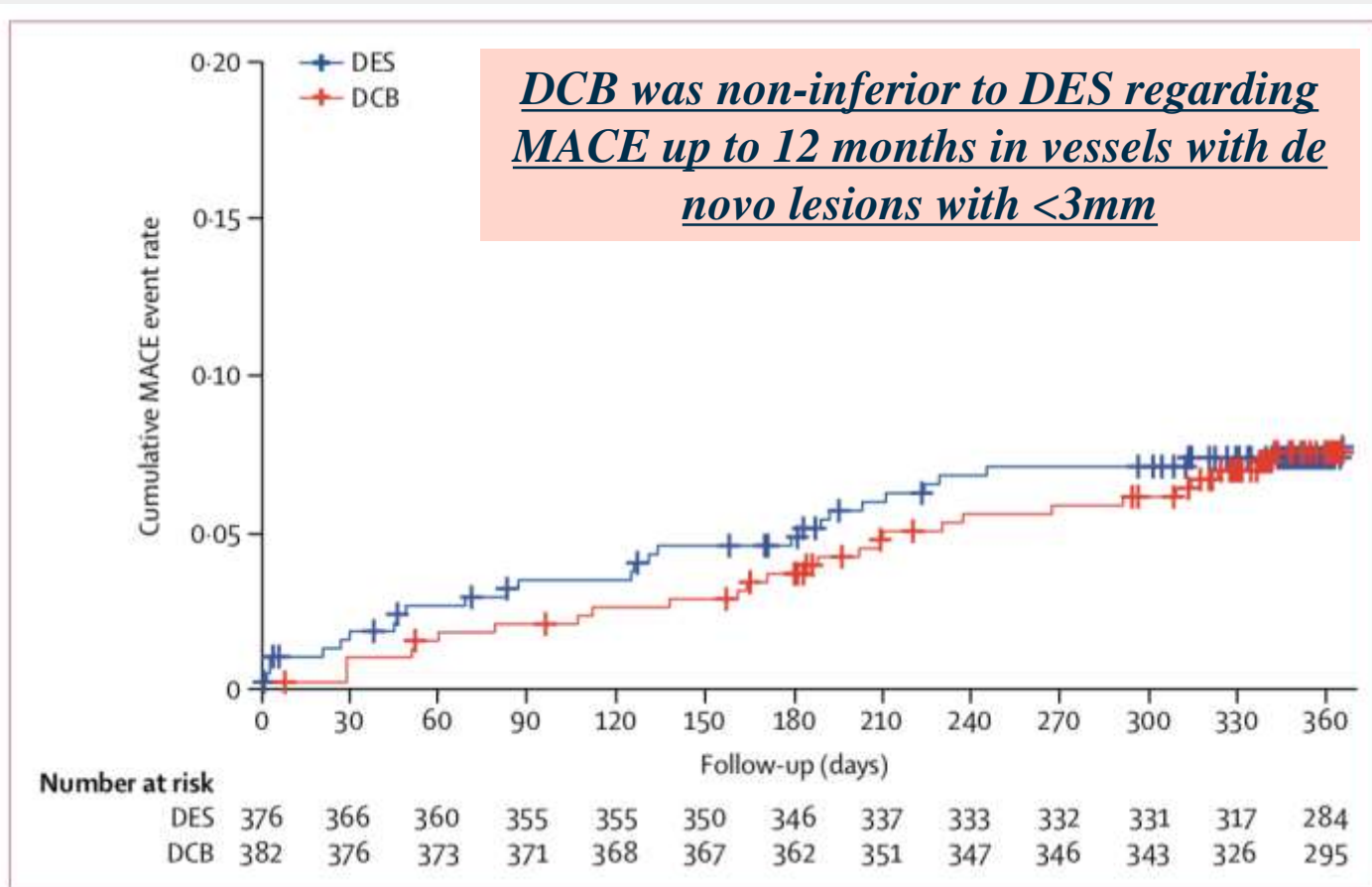
FU 5.1 years, target lesion failure 16.0%

TABLE 4 Predictors of Target Lesion Failure

	Univariate	p Value	Multivariate	p Value
Diabetes mellitus	0.88 (0.53-1.47)	0.63	NA	
Left ventricular ejection fraction (per 1% increment)	0.99 (0.97-1.02)	0.66	NA	
J-CTO score (per 1-U increment)	1.00 (0.80-1.26)	0.98	NA	
Multiple CTOs	1.86 (0.95-3.64)	0.07	1.92 (0.98-3.78)	0.06
Repeat-attempt CTO PCI	1.07 (0.58-1.97)	0.83	NA	
Stent number of the target vessel (per 1 increment)	1.52 (1.03-2.23)	0.03	1.72 (1.16-2.54)	0.006
Average stent diameter (per 1-mm decrement)	1.20 (0.52-2.75)	0.67		
Persistent distal luminal narrowing	2.51 (1.54-4.10)	<0.001	2.73 (1.66-4.47)	<0.001

Lee et al., JACC Int., 2017 Jul 24

Drug Coated Balloon for Small Drug-coated balloons for small coronary artery disease (BASEKT – SMALL 2)



Treatment distal the CTO

- **TIMI III Flow without major dissection and without high grad stenosis ($>90\%$) a conservative treatment, “watch full waiting” could be considered**
- **Major dissection: IVUS for decision making, if intraluminal and no plaque, single balloon angioplasty with low pressure (4atm) can be considered**
- **FFR values post CTO PCI are increasing over time and only small data without clear post CTO PCI cut offs for decision making**
- **In long diffuse disease distal of the CTO with a vessel diameter $<3.0\text{mm}$, drug-coating balloon could be considered**