

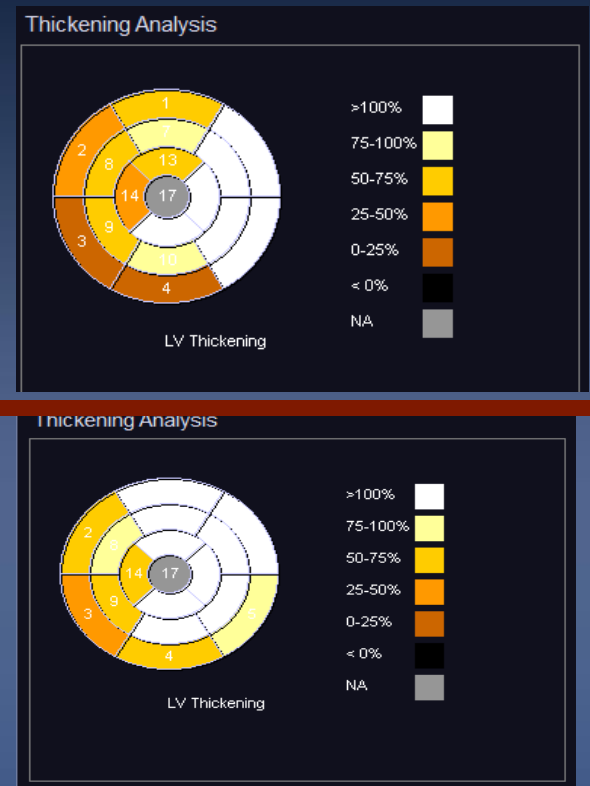
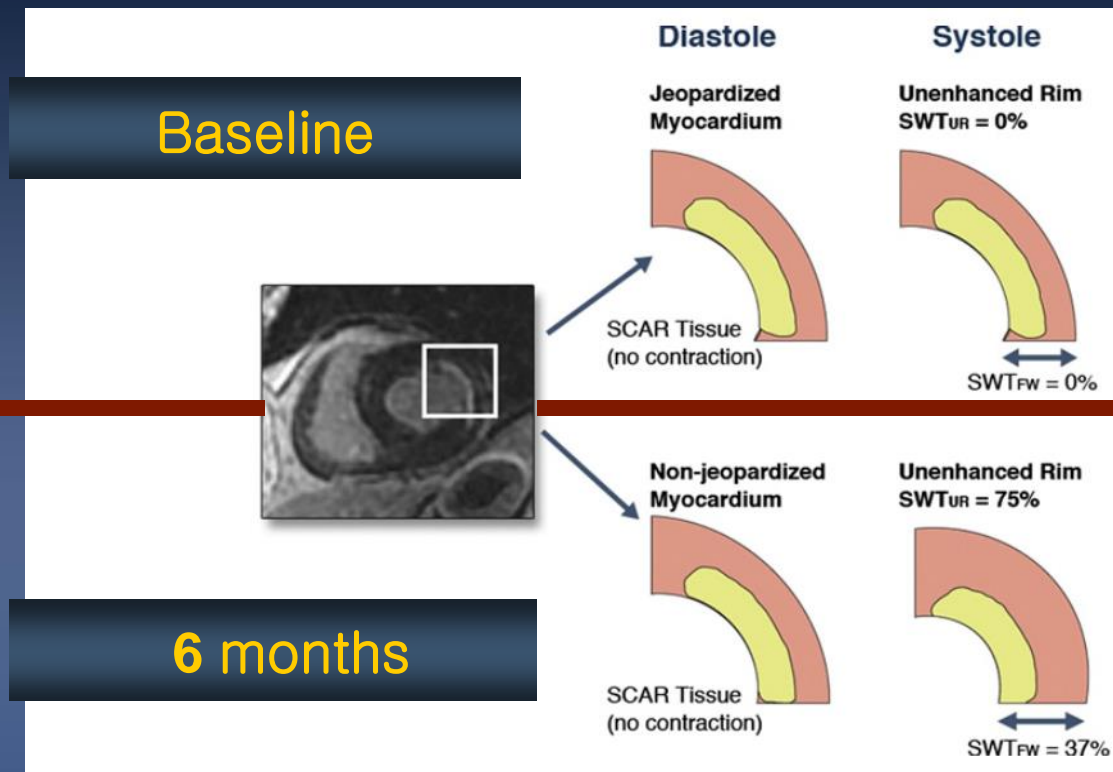


UNIVERSITÄTS
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HERZZENTRUM

REVASC Trial: Cool Down or Heat up CTO Intervention?

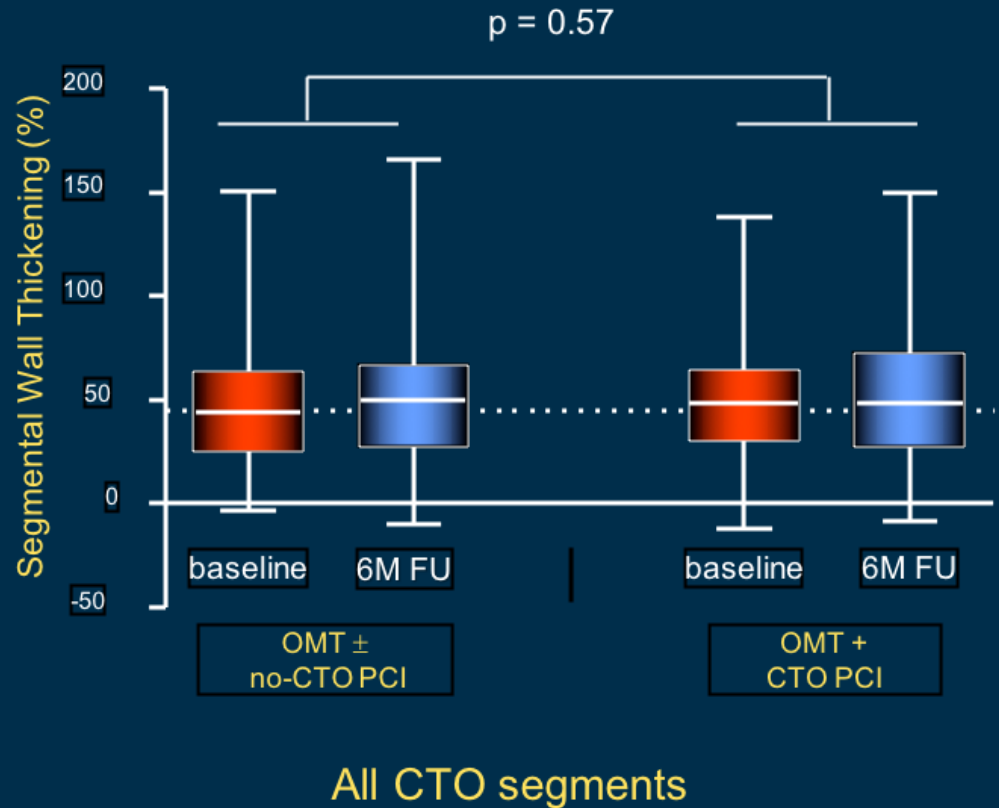
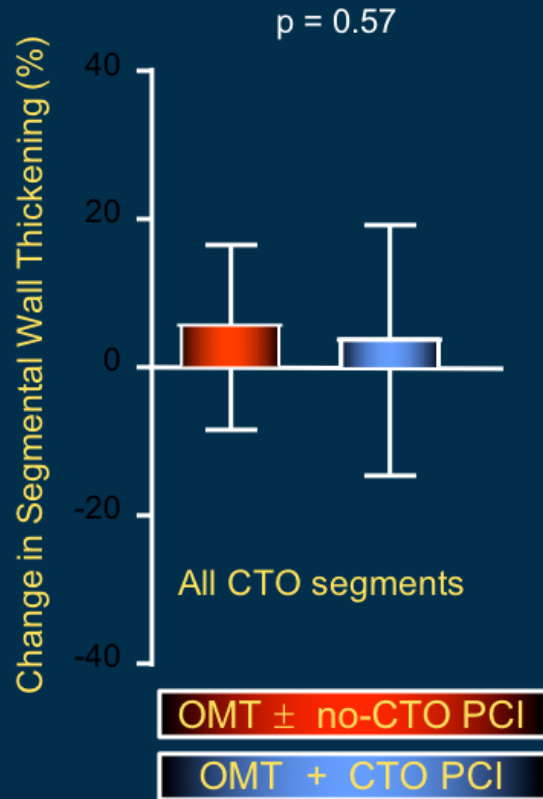
Kambis Mashayekhi, MD
University Heart center Freiburg –
Bad Krozingen
Director of CTO and High Risk Angioplasty

Primary Endpoint: Segmental wall thickening (SWT) measured by cMRI after 6 months

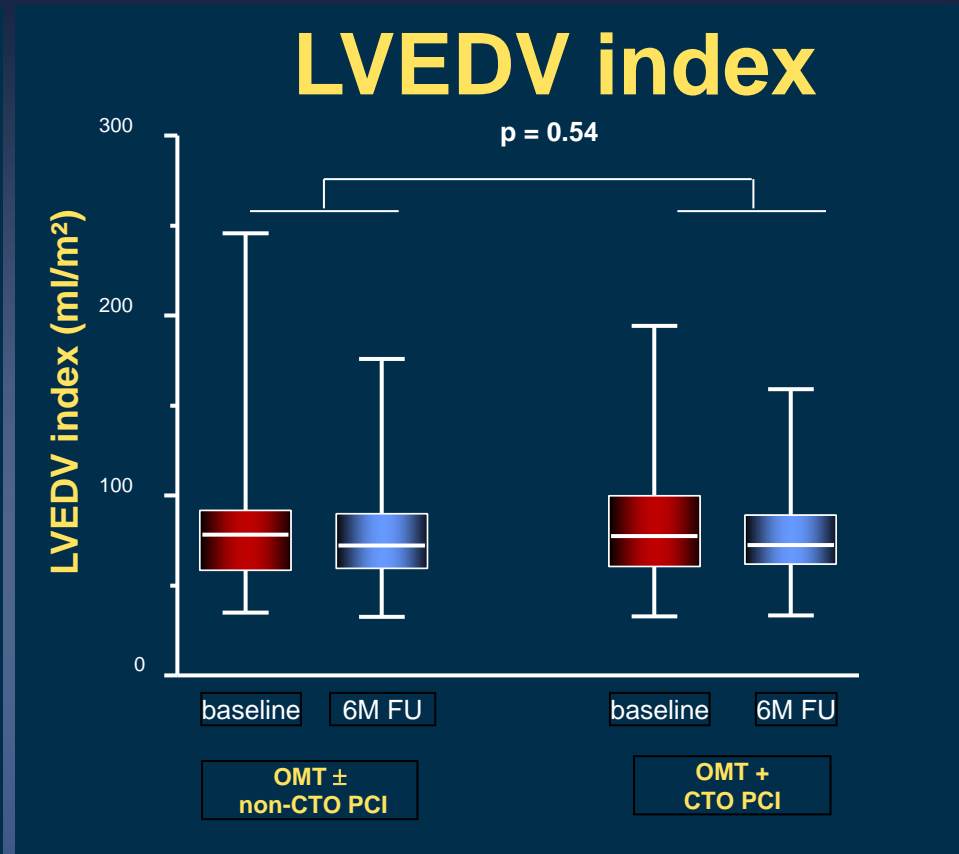
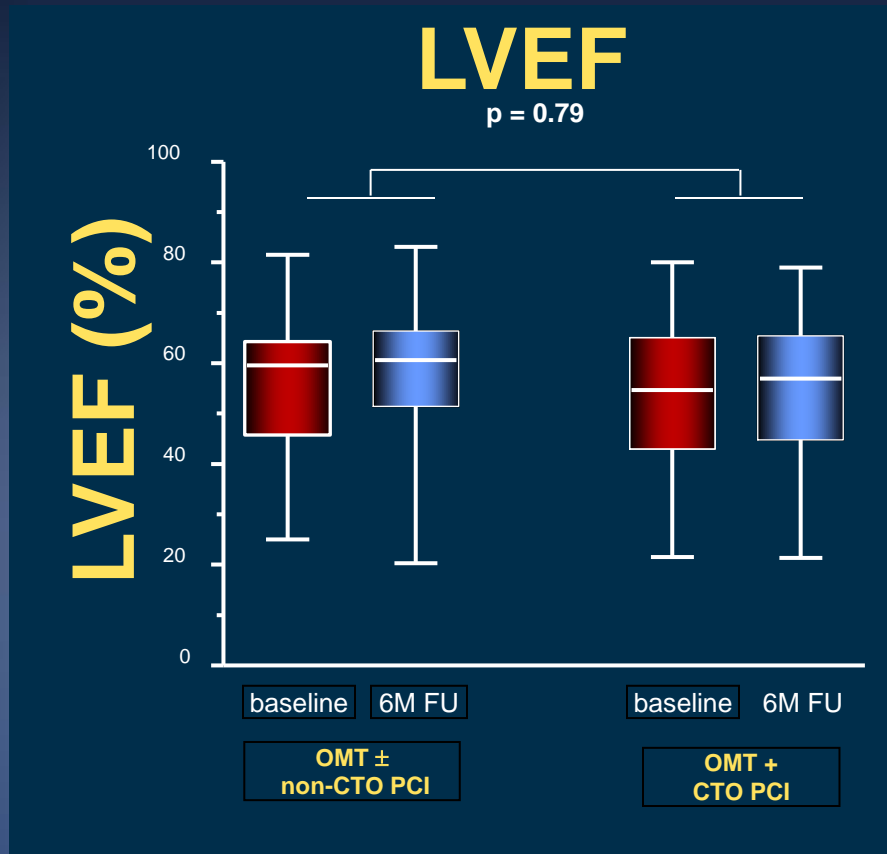


Modified from Kirschbaum SW et al, JACC Cardiovasc Imaging. 2010 Jun;3(6):614-22

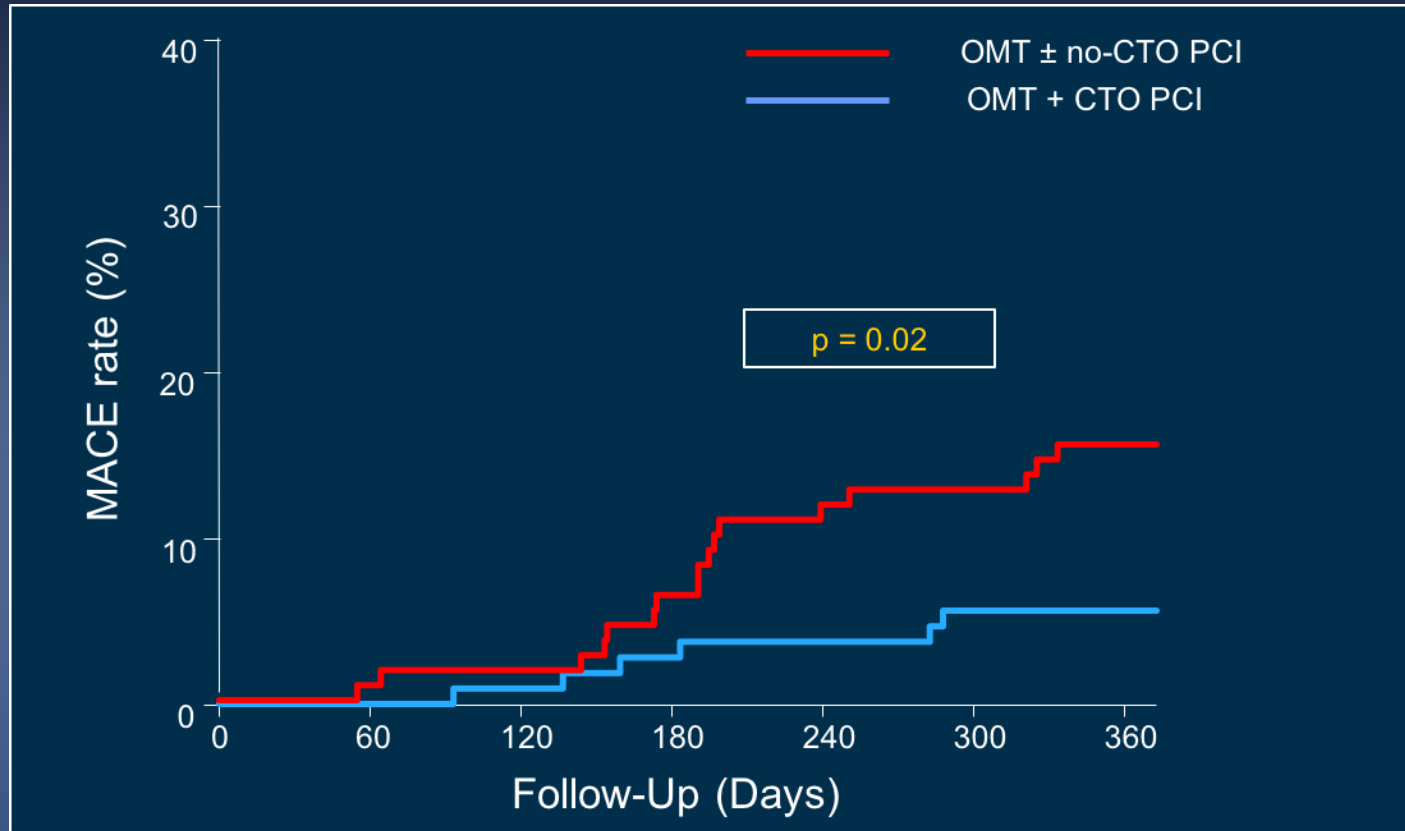
Primary endpoint:



Secondary endpoint:



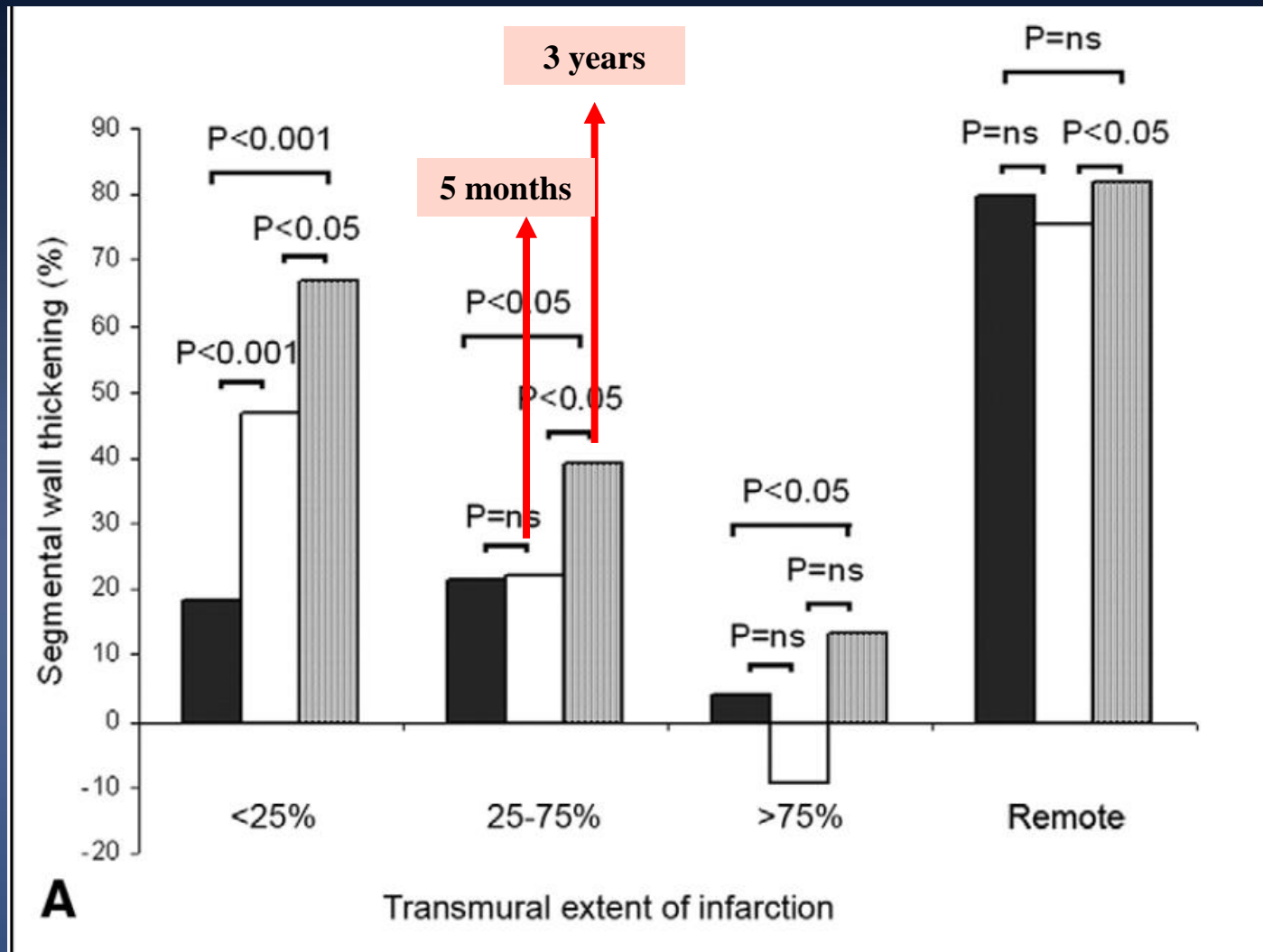
Major adverse cardiac events at 12 months (death, infarction, any revascularization)



Why did Revasc fail?

1. Substantial proportion of patients did not show relevant dysfunction of the CTO segment. Hence, there was little room for improvement.
2. Second, even without CTO PCI, the recovery of SWT after PCI of other relevant lesions was similar to that in the CTO PCI group.
3. Additional PCI was in more than two-thirds of cases undertaken in the donor vessel artery
4. Was not powered to detect differences in clinical endpoints
5. SWT as an imaging parameter has high dispersion and was measured at rest, and may only improve after years
6. A further limitation was that the inclusion of CTO patients was not based on prior cMRI perfusion deficiency and viability.

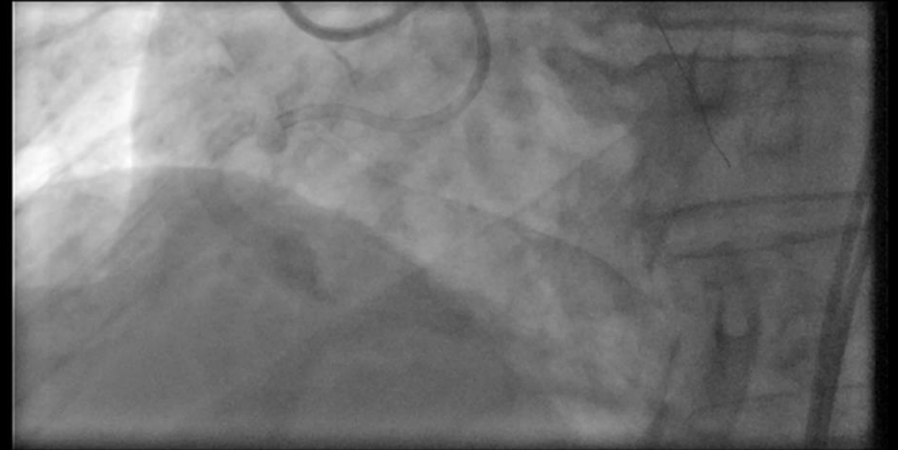
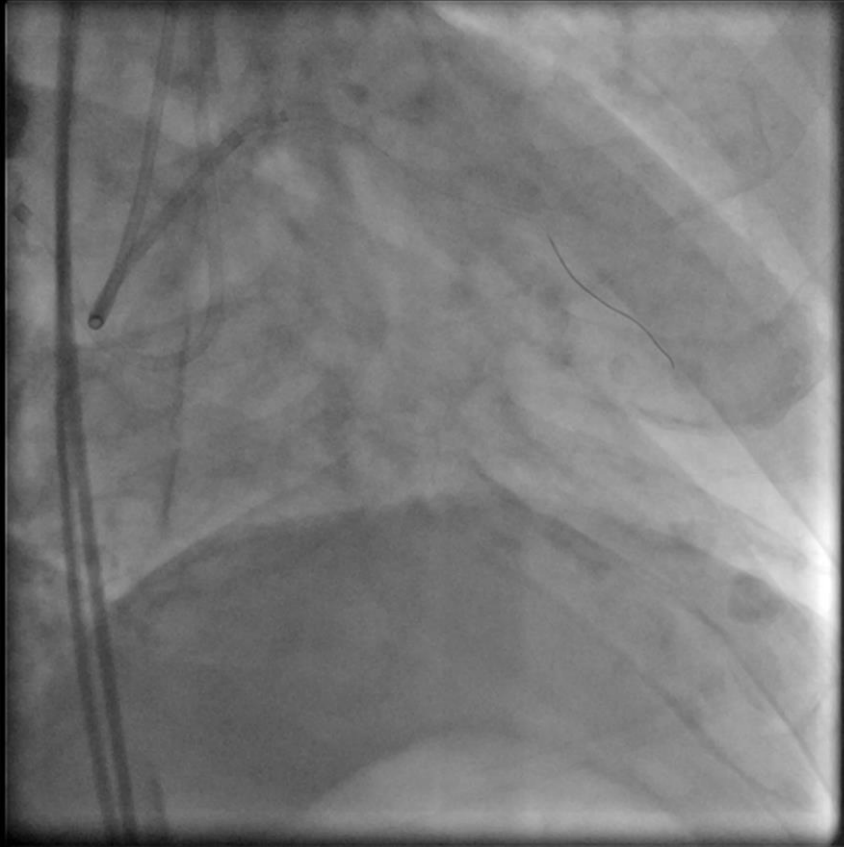
Regional contractility improves over time



Randomized Trials

Trial	N	Study Type	Population	Primary Endpoints:
EXPLORE	304	CTO PCI vs. no CTO PCI	STEMI with CTO	4-month: LVEF, LVEDV per MRI comparable in both groups
DECISION- CTO	834	CTO PCI + OMT vs. OMT	Stable Angina or ACS	3-year death, MI, stroke, or repeat revascularization comparable in both groups
EURO-CTO	396	CTO PCI + OMT vs. OMT	Stable angina	PCI group experienced lower angina frequency per SAQ

Treat it or leave it?



Treat it or leave it?



What is our therapeutic goal in CTO?

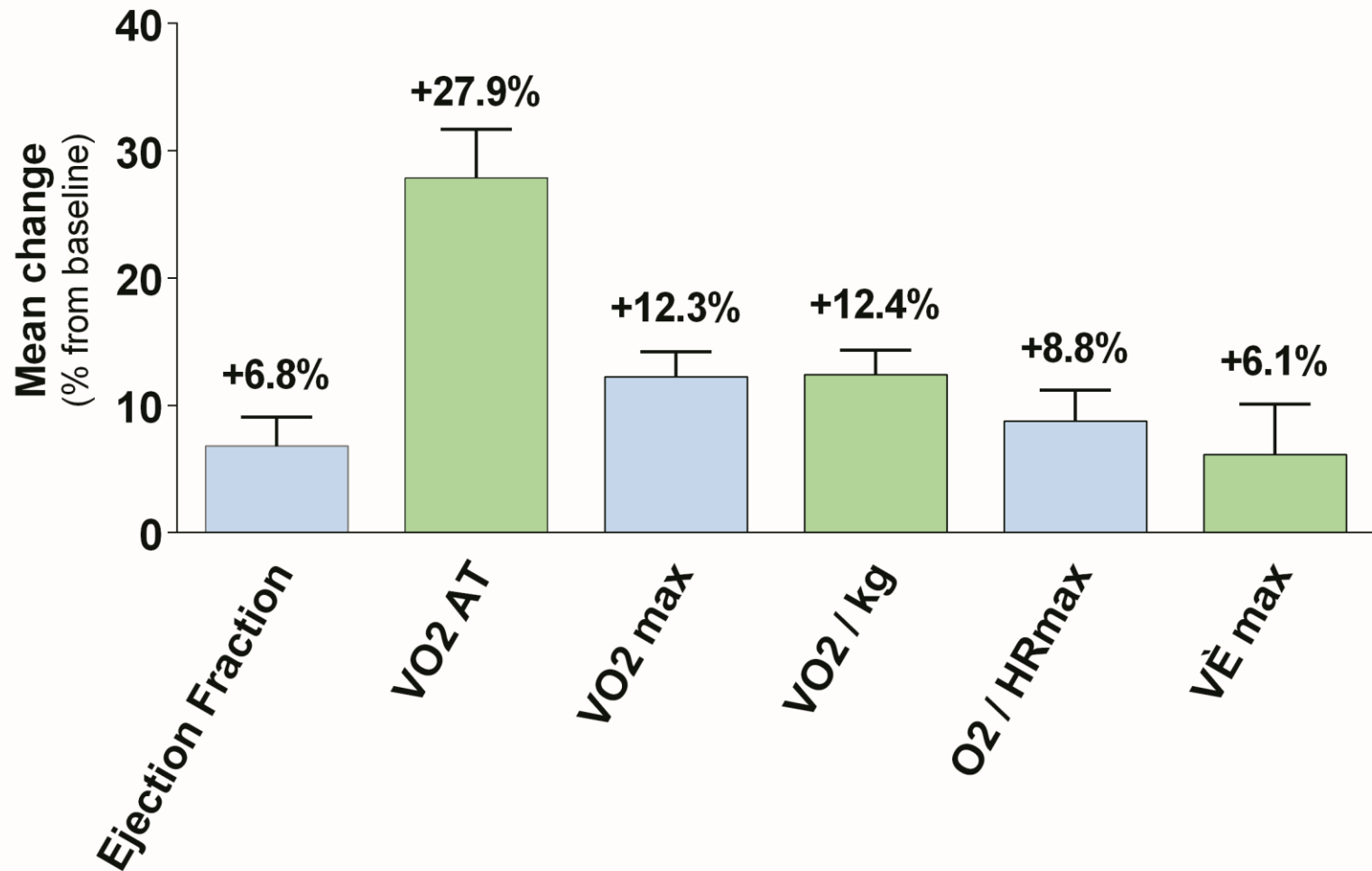
Reduce ischemic burden:

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graph TD; A[Reduce ischemic burden:] --> B[Improve symptoms]; A --> C[Improve prognosis?];
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Improve symptoms

Improve prognosis?

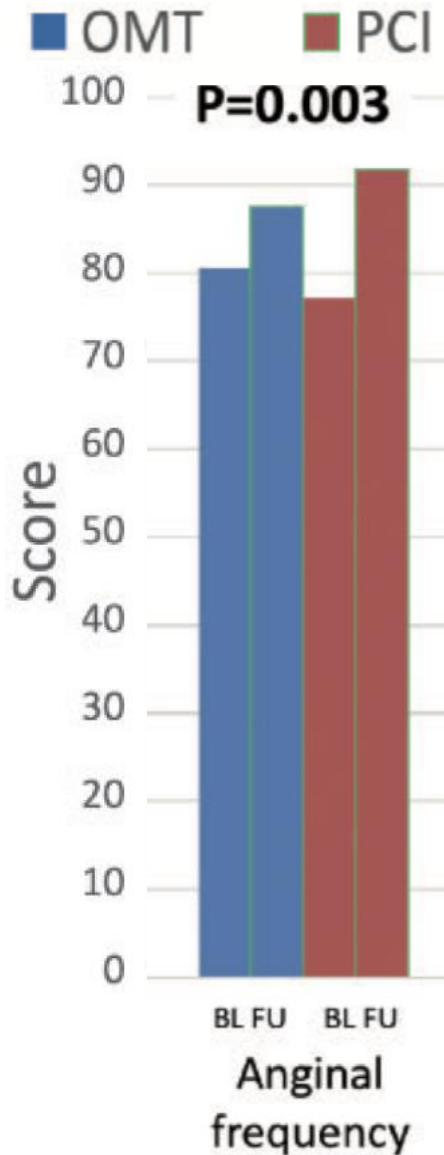
Improving Cardiopulmonary Exercise Capacity in With CTO-PCI



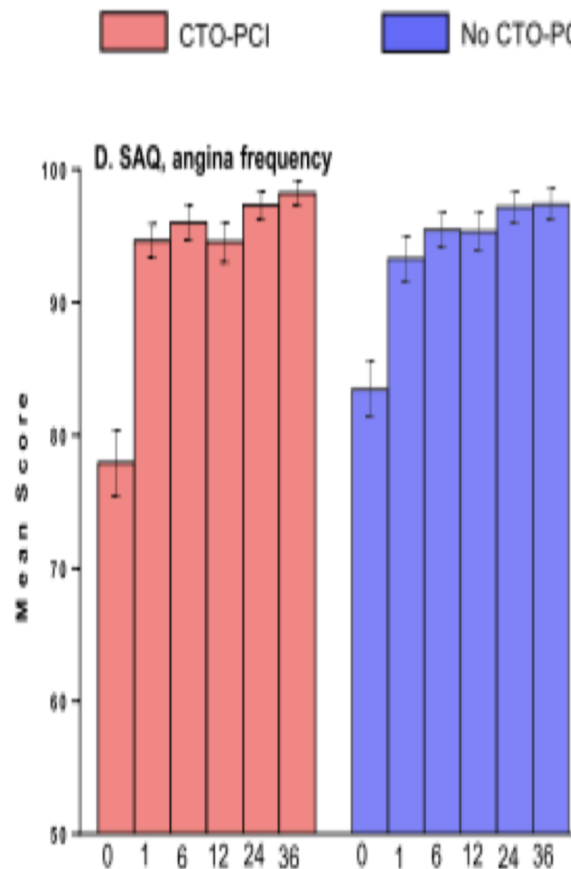
Mashayekhi et. al, JACC 2017

The nature of randomized trials

EuroCTO

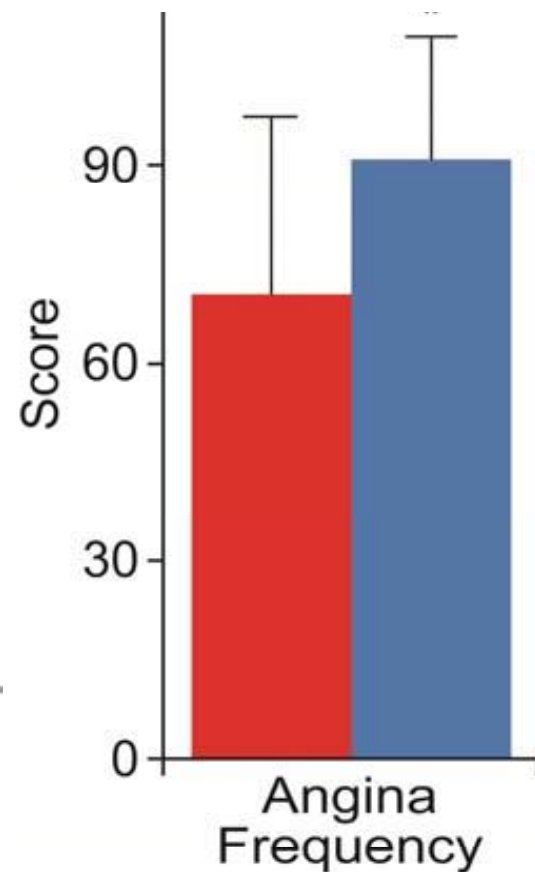


DecisionCTO



OpenCTO-Registry

success (red), failure (blue)



Baseline 81 vs 77
FUP 87 vs 92 Δ 6 vs 15

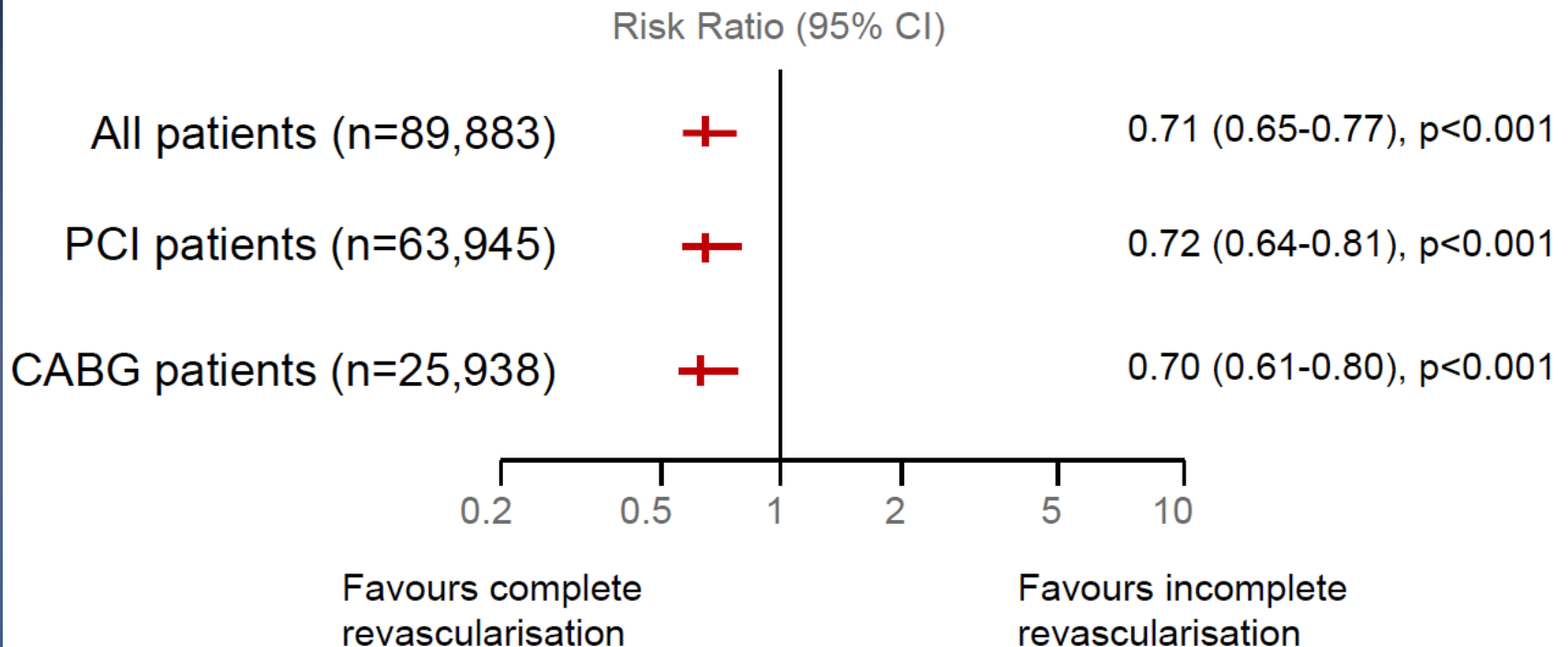
83 vs 77
95 vs 96 Δ 12 vs 19

71
92 Δ 21

69 (failed)
84 Δ 15

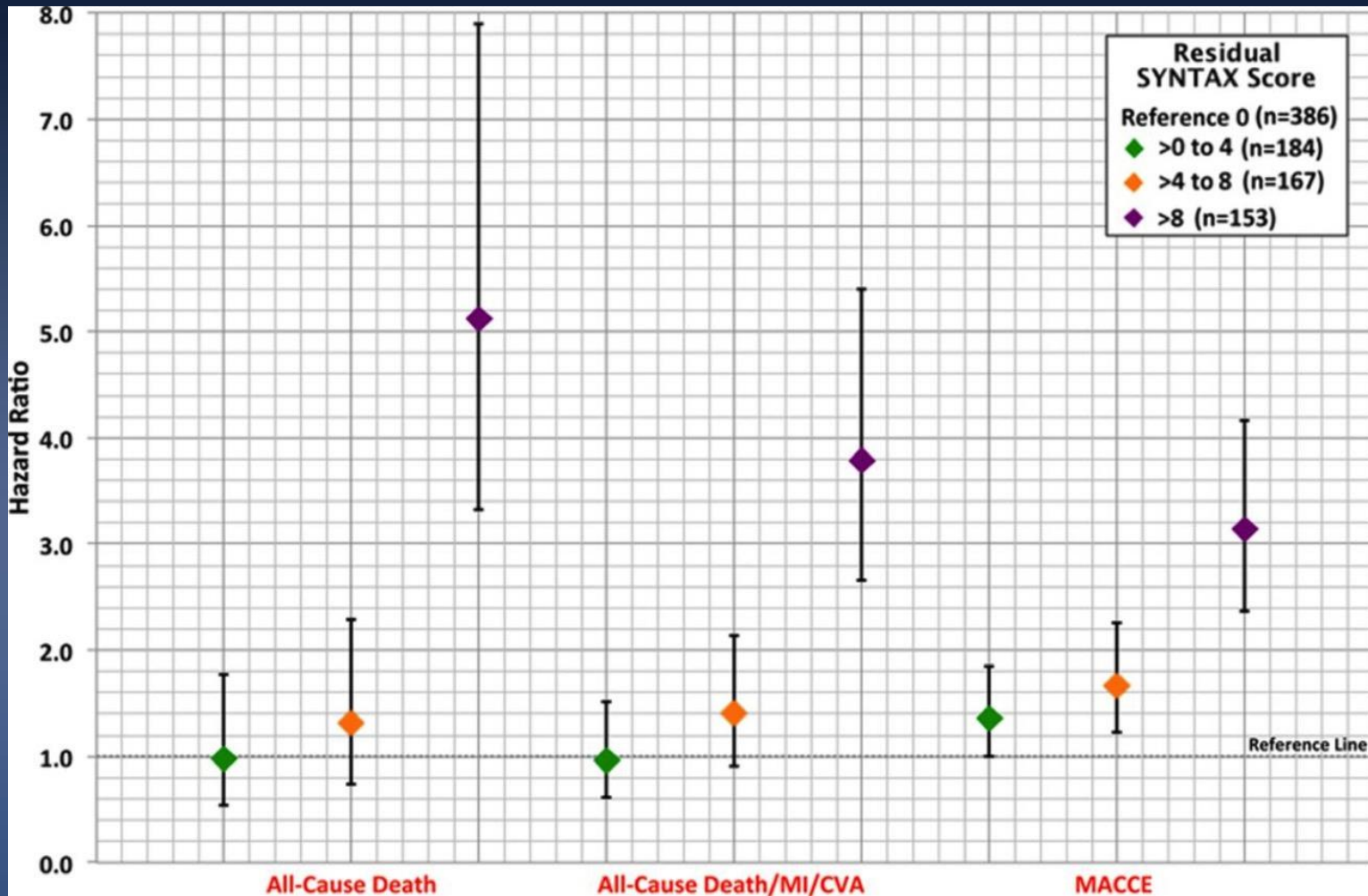
Outcome after incomplete versus complete revascularization in multivessel coronary artery disease (Meta-analysis)

Risk Ratios for long-term mortality



Gracia S. et al JACC 2013

Clinical impact of the residual Syntax Score



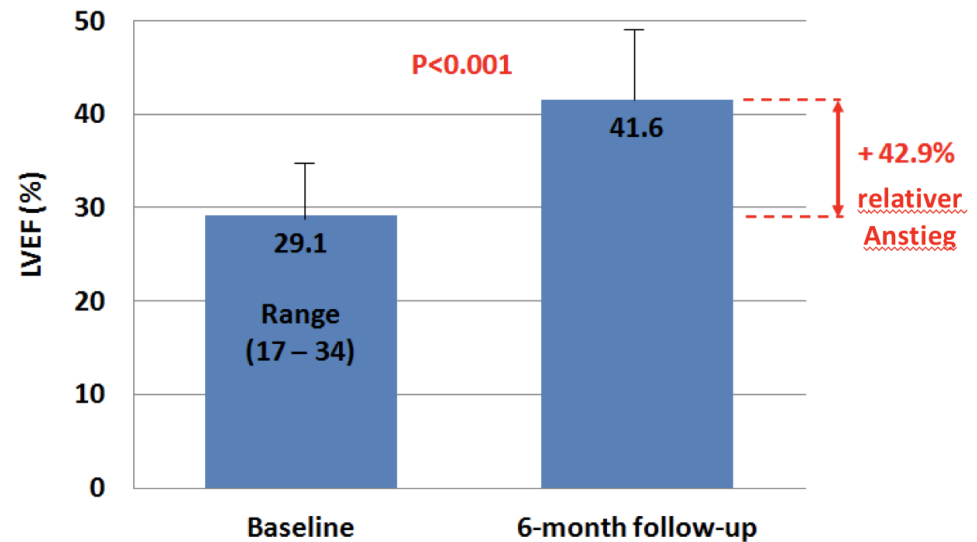
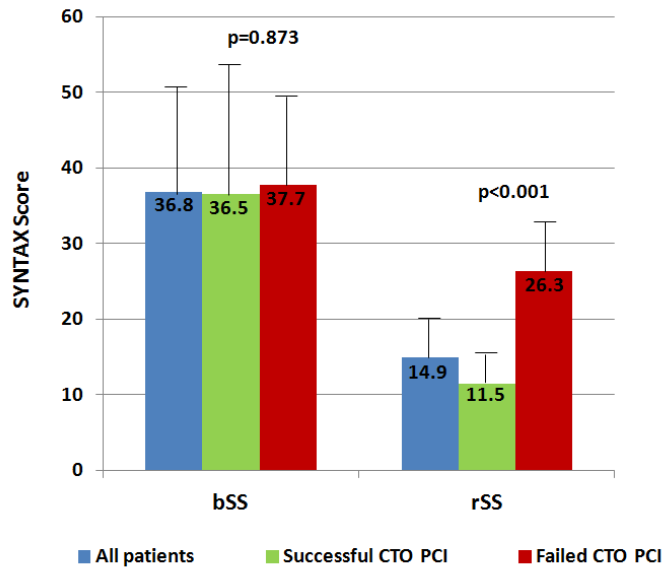
Farooq et al. Circulation. 2013

Total occlusion predictors incomplete revascularization in the PCI arm of SYNTAX

Anatomical/Clinical Characteristic	OR (95% CI)	p Value
PCI-treated patients		
TO	2.70 (1.98–3.67)	<0.001
Any RCA lesion	2.12 (1.33–3.38)	0.002
Left arterial dominance	1.81 (1.26–2.60)	0.001
Additive EuroSCORE ≥ 6	1.58 (1.18–2.13)	0.002
Number of lesions*	1.44 (1.29–1.59)	<0.001
Hyperlipidemia	1.49 (1.08–2.06)	0.015
Any tortuosity	1.39 (1.04–1.86)	0.025
Total bifurcation/trifurcations*	1.32 (1.13–1.53)	<0.001

Farooq V et al., J Am Coll Cardiol 2013

CTO PCI in multivessel disease with EF <35%



Galassi AR,... Mashayekhi K., Jacc Int 2017

Revascularization strategies in CTO

Occlusive lesions are treated as non-occlusive lesions

