Complex PCI in the Era of the ISCHEMIA Trial: An Interventionalist's Perspective







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Disclosures

None



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Initial Invasive or Conservative Strategy for Stable Coronary Disease

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Health-Status Outcomes with Invasive or Conservative Care in Coronary Disease

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Management of Coronary Disease in Patients with Advanced Kidney Disease

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5179 patients

At least moderate ischemia (on a clinically indicated stress test)

CTA (73% of randomized) showed severe CAD

<u>Randomization:</u> Initial invasive vs. Initial conservative strategy

<u>Primary outcome:</u> CV death, MI, UA, HF or cardiac arrest

TCTAP & AP VALVES 2020

Key exclusions GFR <30 Recent ACS Unprotected LMCA LVEF <35% NYHA Class III or IV Severe refractory angina

Revascularization

- within 30 days
- as complete as possible
- PCI vs. CABG per local Heart Team





Who Got Into the Trial?

26,000 stress tests with mod-severe ischemia screened

32% of those without exclusion (i.e. trial eligible)

8518 enrolled and 5179 randomized

20% of screened subjects were randomized





What Did They Look Like?

64 years old (58-70)

77.4% Male

66.3% White

41.8% with Diabetes (9.5% on insulin)

20.3% prior PCI, 3.9% prior CABG

LVEF 60% (4% with h/o HF) TCTAP & AP VALVES 2020







Angiography in 96% of Invasive group

79% underwent revascularization

74% PCI, 26% CABG

Angiography in 26% of Conservative group

21% got revascularization (Crossovers)







Angiographic Characteristics







Revascularization Characteristics







How does it compare to the COURAGE trial?

Differences

Similarities

Higher burden of ischemia (86% mod-severe)

Low burden of symptoms

Most randomized *before* angiography

Preserved LVEF/non-HF

Drug-eluting stents (and some FFR)

Significant crossover

Goal of more complete revasc (~1/4 CABG)





How Did They Fool?



Mo

lly

None

Weekly

HOW DIU THEY FEEL				
Characteristic	Invasive Strategy (N = 2588)	Conservative Strue₂gy (N=2591)	Total (N = 5179)	
Angina				
History — no./total no. (%)	2329/2588 (90.0)	2312/2591 (.2)	4641/5179 (89.6)	
Began or became more frequent within previous 3 mo — no./total no. (%)	680/2584 (26.3)	675/2583 .6.1)	1355/5167 (26.2)	
New onset within previous 3 mo — no./total no. (%)	415/2452 (16.9)	440/24 (17.8)	855/4918 (17.4)	
SAQ Angina Frequency score∫	80.7±20.0	82.1±19.2	81.4±19.6	
Daily or weekly angina — no./total no. (%)∫	502/2314 (21.7)	442/2333 (18.9)	944/4647 (20.3)	
Angina several times per mo — no./total no. (%)§	1018/2314 (44.0)	1039/2333 (44.5)	2057/4647 (44.3)	
No angina in previous 4 wk — no./total no. (%)§	794/2314 (34.3)	852/2333 (36.5)	1646/4647 (35.4)	

0

Daily

~35% with no recent angina





<u>Results</u>

Primary outcome

Composite Primary Outcome:

- 1. Cardiovascular Death
- 2. Myocardial Infarction
- 3. Unstable Angina
- 4. Heart Failure
- 5. Cardiac Arrest

6 months

5.3% invasive vs. 3.4% conservative (95% CI 0.8 to 3.0)

5 years

16.4% invasive vs. 18.2% conservative (95% CI -4.7 to 1.0)

All cause death

145 vs. 144





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Myocardial Infarction



	I	nvasive	Conservative	
No. of patients with events		210	233	
Cumulative event rate — %				
At 6 mo	↑Procedural	4.3	2.6	1.8 (0.8 to 2.8)
At l yr		5.3	3.8	1.5 (0.3 to 2.6)
At 2 yr		6.3	6.5	-0.1 (-1.5 to 1.2)
At 3 yr		7.7	8.5	-0.7 (-2.3 to 0.8)
At 4 yr		8.9	10.1	-1.2 (-3.0 to 0.6)
At 5 yr	↓Spontaneous	s 10.3	11.9	-1.6 (-3.9 to 0.7)
Restricted mean event-free time		4.6 yr	4.6 yr	3.2 days (-20.3 to 26.7)



FAME 2 at 5 years

ISCHEMIA











What about Angina?

Primary assessment tool - Seattle Angina Questionnaire (SAQ)

At baseline, 35% reported no angina in the previous month





Sustained Relief from Angina





Upfront Revascularization in SIHD





Upfront Revascularization in SIHD





Upfront Revascularization in SIHD









Routine Revascularization versus Initial Medical Therapy for Stable Ischemic Heart Disease: A Systematic Review and Meta-Analysis of Randomized Trials		<u>Trials</u> ACME1
Sri Bangalore et al	Circulation	ACMEZ AVEDT
	Published Ahead of Print	BARI 2D
14 RCT's, 14,877 patients, mean follow-up 4.5 years		COURAGE DEEER
Invasive vs. Conservative strategy for SIHD		FAME 2
Death	RR 0.99 (95% CI 0.90-1.09)	JSAP ISCHEMIA
Procedural MI	RR 2.48 (95% CI 1.86-3.31)	ISCHEMIA-CKD MASS-1
Spontaneous MI	RR 0.76 (95% CI 0.67-0.85)	MASS-1 MASS-2
Unstable Angina	RR 0.64 (95% CI 0.45-0.92)	RITA-2 TIME
Freedom from Angina	RR 1.10 (95% CI 1.05-1.15)	



Will The Ischemia Trial Impact Guidelines?

2012 U.S. Guidelines SIHD

CLASS I

- CABG to improve survival severe 3-V CAD or 2-V CAD with prox LAD
- 2. CABG or PCI in any CAD to improve symptoms refractory to GDMT

CLASS IIa

- 1. CABG to improve survival severe 2-V CAD and *extensive ischemia*
- 2. CABG or PCI in \geq 1-V CAD to improve symptoms when GDMT can't be implemented

2017 U.S. Appropriate Use Criteria

CAD and *Mod-Severe Ischemia* Scores 5-8 for CABG or PCI (even w/o meds or symptoms), *except* CABG for 1-V non-prox LAD/dom LCX (R3)

2018 ESC Guidelines Revascularization

CLASS I

- 1. CABG or PCI to improve prognosis if *large area of ischemia*
- 2. CABG or PCI to improve symptoms refractory to GDMT
 (CABG better if 3V with intermed/high SYNTAX score and/or DM *and* low surgical risk)

1-3 R = Rarely appropriate
4-6 M = May be appropriate
7-9 A = Appropriate



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Conclusions

- In SIHD with moderate-to-severe ischemia, upfront revascularization does not improve survival.
- Coronary CTA is a validated diagnostic modality in the assessment of SICD (and may displace the use of some stress imaging and invasive angiography).
- Upfront revascularization in SICD may cause procedural MI's, which may be counterbalanced by a decrease in later spontaneous MI's .
- Early revascularization in SICD provides durable relief from angina.



What Did We learn? Treat the Patient Not the Stress Test



