AFRICA STEMI LIVE 2018

Heart of Africa

AFRICA STEMI LIVE!

2018

THE EPIDEMIC OF CORONARY ARTERY DISEASE HAS
ARRIVED IN AFRICA.
ARE YOU READY FOR IT?

How to approach non-infarct related artery disease in patients with STEMI in a limited resource setting

Ahmed A A Suliman, MBBS, FACP, FESC
Associate Professor, University of Khartoum
Interventional Cardiologist, Shan Teaching Hospital
Khartoum, Sudan

Introduction

- In patients with ST-segment myocardial infarction (STEMI) primary percutaneous coronary intervention (PCI) of the culprit lesion is the treatment of choice .

- Approximately 50% of patients with STEMI have multivessel disease

  Goldstein JA et al. Multiple complex coronary plaques in patients with acute myocardial infarction. NEJM. 2000

- It has been shown that such patients have a worse outcome compared to patients with single vessel disease

  Sorajja P et al. Impact of multivessel disease on reperfusion success and clinical outcomes in patients undergoing primary percutaneous coronary intervention for acute myocardial infarction. EHJ. 2007

What to do with the non infarct related artery (N-IRA)?

Open everything. Open is better

Preventive PCI concept:

The “COURAGE” trial tested the hypothesis in stable angina and failed.

Multicenter, open-label, parallel-group, randomized, controlled trial

N=2,287

PCI plus OMT (n=1,149)

OMT alone (n=1,138)

Setting: 50 centers in US and Canada

Enrollment: June 1999 to January 2004

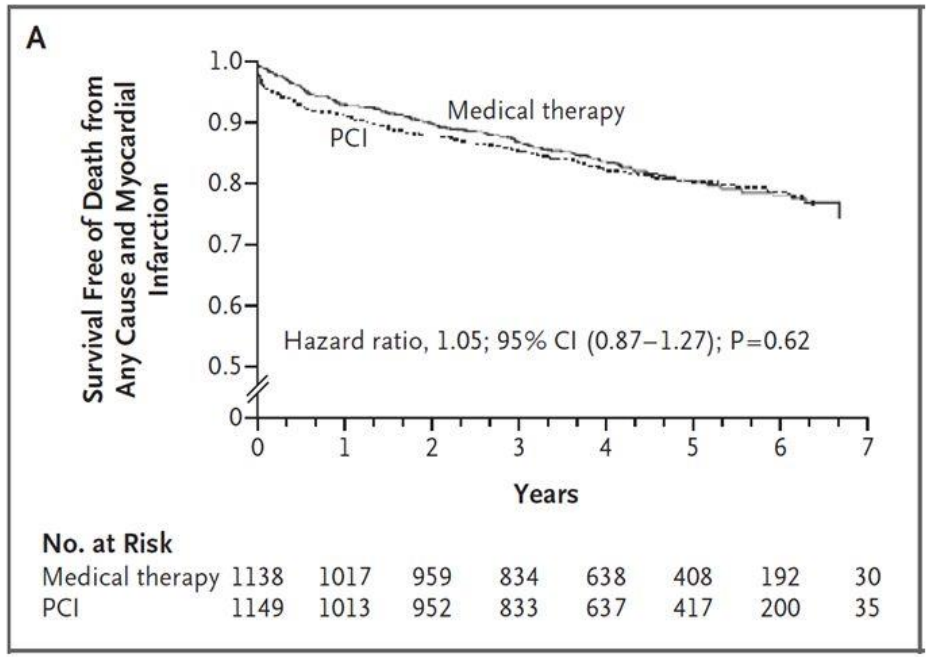
Median follow-up: 4.6 years

Analysis: Intention-to-treat

Primary outcome: Composite of death from any cause and nonfatal MI

19% vs. 18.5% (HR 1.05; 95% CI 0.87-1.27; P=0.62)

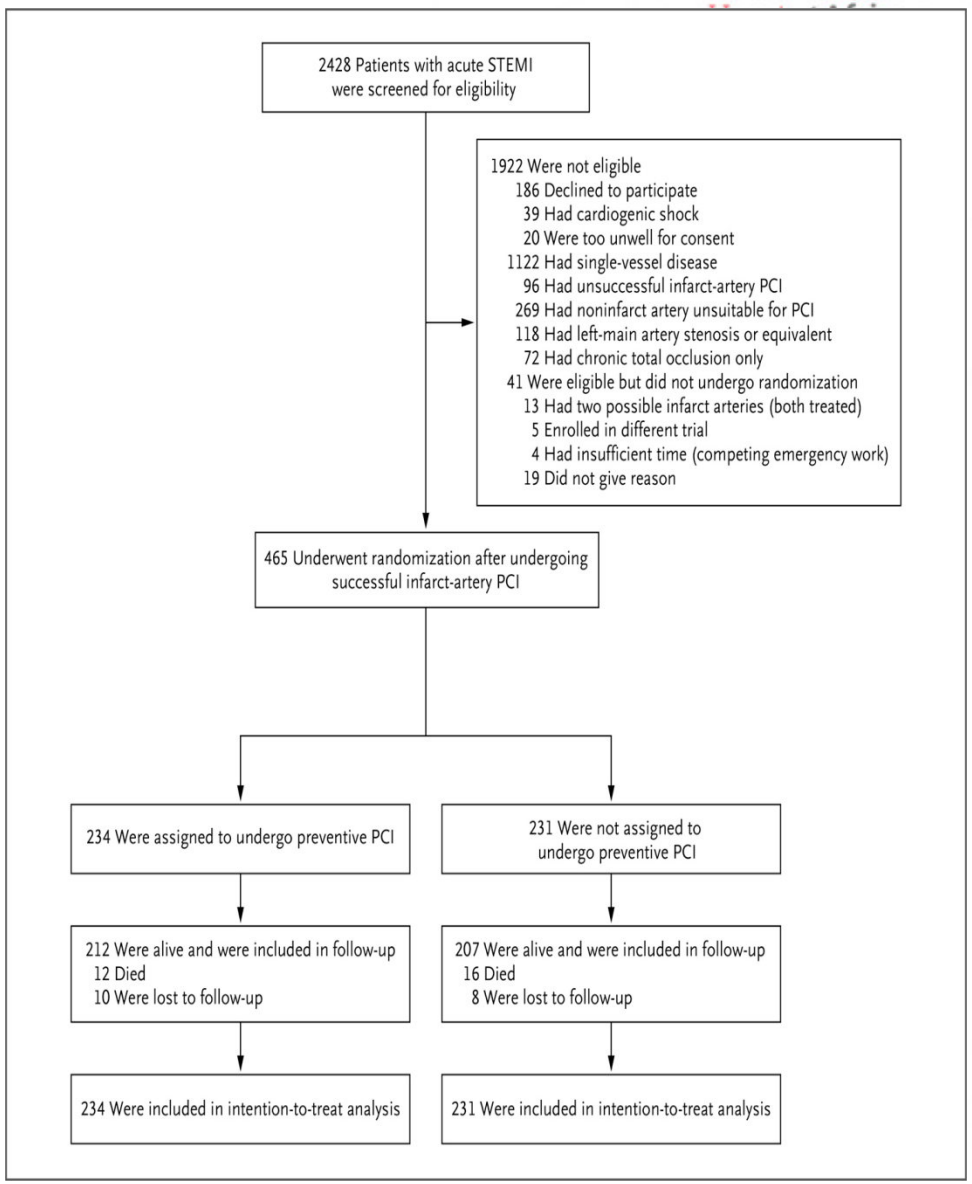
Courage Trial: No Difference Between Initial PCI And Medical Management



Boden. NEJM, 2007.

PRAMI (Preventive Angioplasty in Myocardial Infarction)

- Multicenter, prospective, randomized, single blinded trial
- N=465
- Preventative PCI (n=234)
- No preventative PCI (n=231)
- Setting: 5 centers in the UK
- Enrollment: 2008-2013 (stopped early)
- Mean follow-up: 23 months
- Analysis: Intention-to-treat
- Primary outcome: CV mortality, non-fatal MI, or refractory angina



Breakdown of PRAMI results

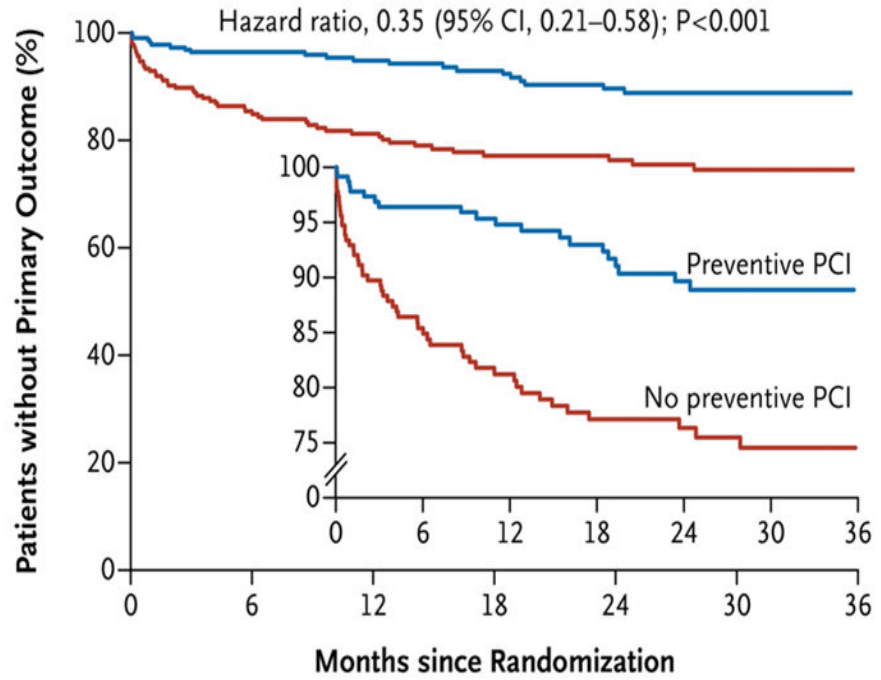


Table 3. Prespecified Clinical Outcomes.*

Outcome	Preventive PCI (N=234)	No Preventive PCI (N=231)	Hazard Ratio (95% CI)	P Value
	no. of events			
Primary outcome				
Death from cardiac causes, nonfatal myocardial infarction, or refractory angina†	21	53	0.35 (0.21–0.58)	<0.001
Death from cardiac causes or nonfatal myocardial infarction†	11	27	0.36 (0.18–0.73)	0.004
Death from cardiac causes	4	10	0.34 (0.11–1.08)	0.07
Nonfatal myocardial infarction	7	20	0.32 (0.13–0.75)	0.009
Refractory angina	12	30	0.35 (0.18–0.69)	0.002
Secondary outcomes				
Death from noncardiac causes	8	6	1.10 (0.38–3.18)	0.86
Repeat revascularization	16	46	0.30 (0.17–0.56)	<0.001

* All patients underwent infarct-artery PCI.
† Only the first event per patient is listed.

CV mortality + non-fatal MI + refractory angina

Non IRA intervention in PRAMI

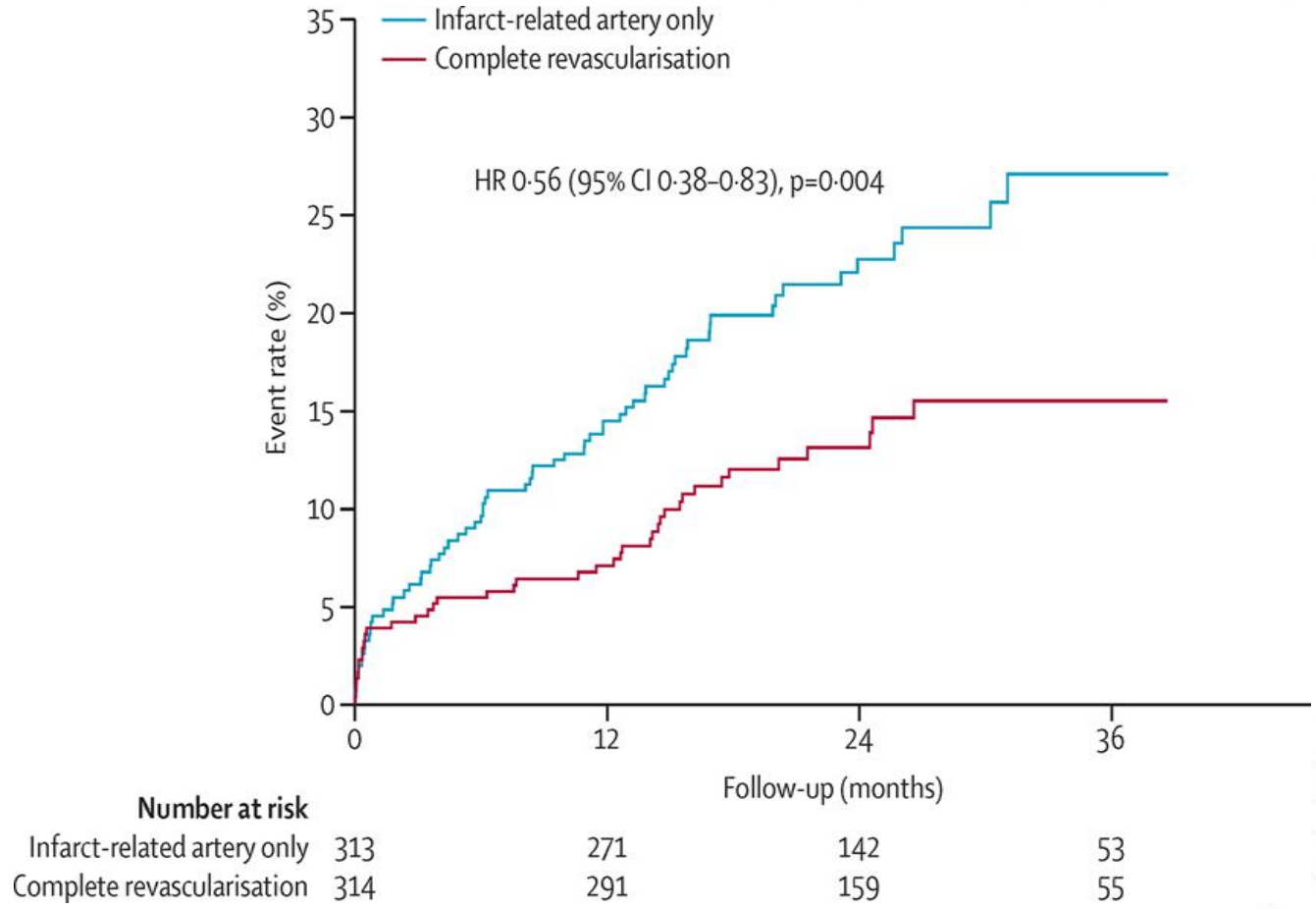
- The location of non-culprit segment not reported.
- At least an extra stent used
- An extra 100 cc of dye per patient (300 cc vs 200cc)

Table 2. Details Regarding PCI and Medical Therapy at Discharge.*

Variable	Preventive PCI (N=234)	No Preventive PCI (N=231)
PCI		
Infarct artery		
No. of stents per artery†	1.56±0.75	1.42±0.70
Stent length — mm	21.8±6.7	21.3±5.6
Stent diameter — mm	3.2±0.4	3.2±0.4
Stent type — no. (%)		
Bare-metal	86 (37)	96 (42)
Drug-eluting	147 (63)	135 (58)
No stenting‡	1 (<1)	0
Noninfarct artery		
No. of arteries treated per patient	1.36±0.77	NA
No. of stents per artery	1.29±0.53	NA
Stent length — mm	19.4±5.8	NA
Stent diameter — mm	3.1±0.9	NA

CvLPRIT trial

- Multicenter, randomized, open-label, active-comparator trial
- N=296
- Target lesion-only revascularization (N=146)
- Complete revascularization (N=150)
- Setting: 7 UK centers
- Enrollment: May 2011 - May 2014
- Duration of follow-up: 12 months
- Analysis: Intention-to-treat
- Primary outcome: MACE (death, nonfatal MI, heart failure, repeat revascularization)



Gershlick AH *et al.* JACC. 2015;65:963-72.

CvLPRIT results

- Included patients with 70 % (or 50% on two views)
- None of the individual end-points was significant including mortality

Major Adverse Cardiac Events and Individual End Points in CVLPRIT

Event	IRA only (%)	Complete revascularization (%)	p
MACE	21.2	10.0	0.009
All-cause mortality	4.1	1.3	0.14
Recurrent MI	2.7	1.3	0.39
Heart failure	6.2	2.7	0.14
Repeat PCI	8.2	4.7	0.2

CvLPRIT revisited

TABLE 2 Periprocedural Details, Discharge Medication, and Ischemia Testing

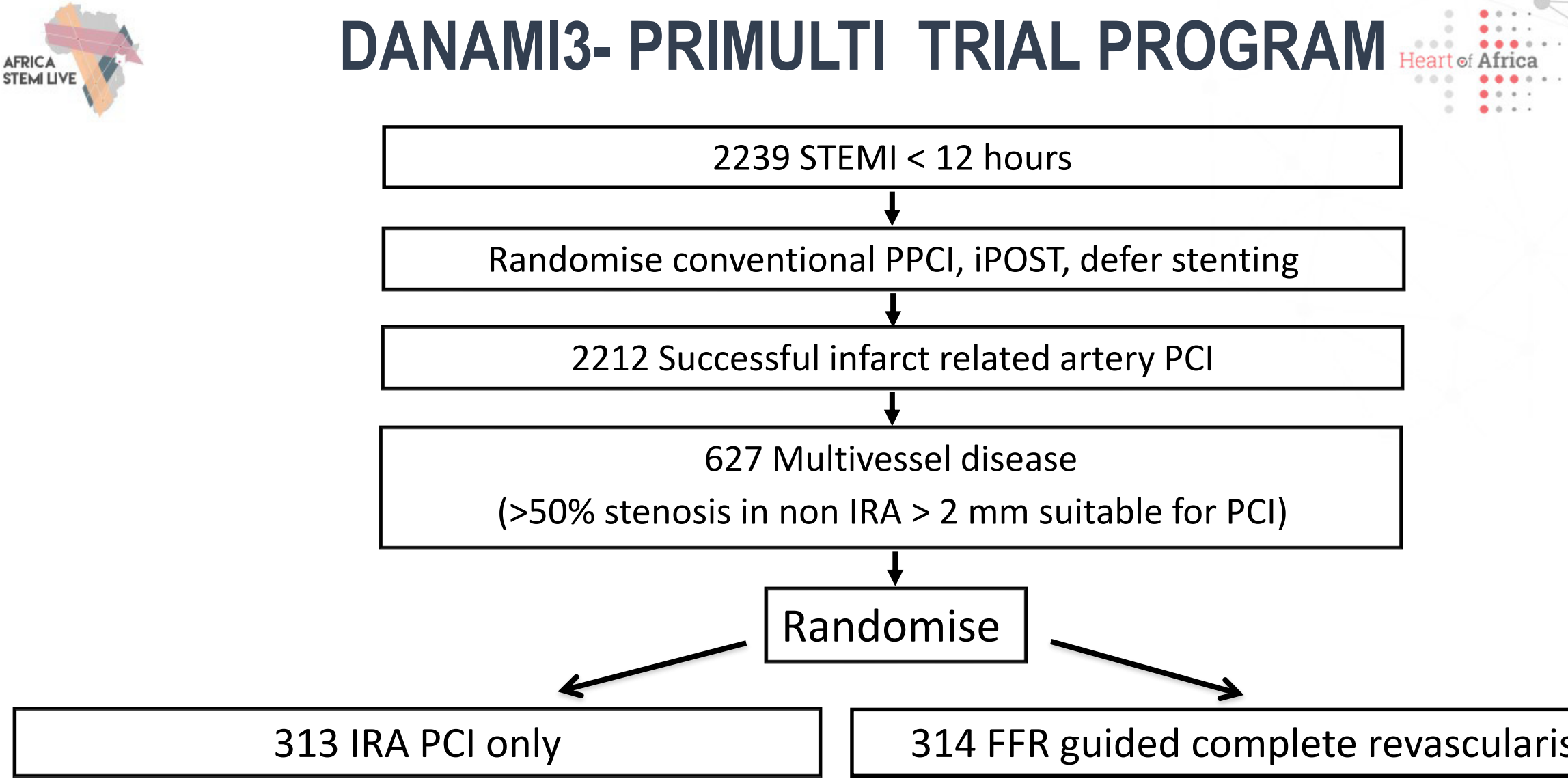
	Complete Revascularization (n = 150)	IRA-Only Revascularization (n = 146)	p Value
ASA	141/142 (99.3)	131/135 (97.0)	0.16
Plus clopidogrel	59/144 (41.0)	54/138 (39.1)	0.75
Plus ticagrelor	19/144 (13.2)	18/135 (13.3)	0.97
Plus prasugrel	58/144 (40.3)	64/138 (46.4)	0.30
Plus warfarin	1/147 (0.7)	2/138 (1.5)	0.61
GPI	46/145 (31.7)	44/139 (31.7)	0.99
Bivalirudin	79/139 (56.8)	65/128 (50.8)	0.32
TIMI flow grade 0/1 on arrival	120/147 (81.6)	118/140 (84.3)	0.55
Thrombus aspiration catheter used	93/145 (64.1)	105/140 (75.0)	0.047
DES	141/147 (95.9)	127/140 (90.7)	0.08
Stents per patient	3 (2–4)	1 (1–2)	<0.0001
Total procedure time, min	55 (38–74)	41 (30–55.5)	<0.0001
Total contrast used, ml	250 (190–330)	190 (150–250)	<0.0001
Beta-blocker	137/147 (93.2)	126/135 (93.3)	0.96
ACEI/ARB	142/147 (96.6)	129/135 (95.6)	0.65
Statin	146/146 (100)	133/135 (98.5)	0.14
Aldosterone antagonist	9/147 (6.1)	8/135 (5.9)	0.95
Other antianginal agent	55/147 (37.4)	49/135 (36.3)	0.85
Loop diuretic agent	15/147 (10.2)	17/135 (12.6)	0.53

CvLPRIT revisited

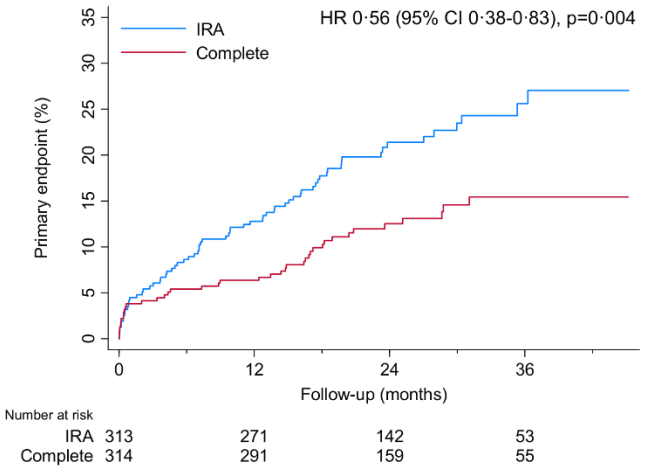
N-IRA : LMS + pLA D < 20% in both arms

IRA site (selected CASS)			
1 Proximal RCA	29 (19.3)	30 (20.5)	
2 Mid RCA	23 (15.3)	24 (16.4)	0.82
11 LMS	0	0	
12 Proximal LAD	29 (19.3)	31 (21.2)	
13 Mid LAD	22 (14.7)	16 (11.0)	
18 Proximal Cx	9 (6.0)	13 (8.9)	
Other	38 (25.3)	32 (21.9)	
N-IRA anatomic site (selected CASS)			
1 Proximal RCA	23 (15.3)	22 (15.1)	
2 Mid RCA	24 (16.0)	23 (15.8)	0.96
11 LMS	1 (0.7)	2 (1.4)	
12 Proximal LAD	27 (18.0)	21 (14.4)	
13 Mid LAD	44 (29.3)	49 (33.6)	
18 Proximal Cx	20 (13.3)	20 (13.7)	
Other	11 (7.3)	9 (6.2)	
N-IRA stenoses >70%	131 (87.3)	118 (80.8)	0.12

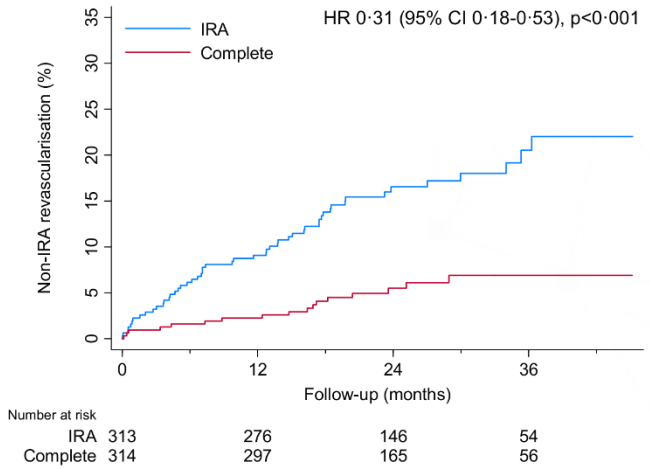
DANAMI3- PRIMULTI TRIAL PROGRAM



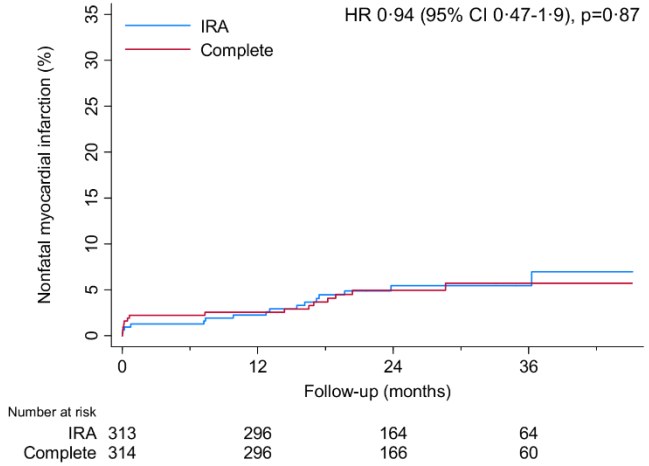
Individual components of primary endpoint



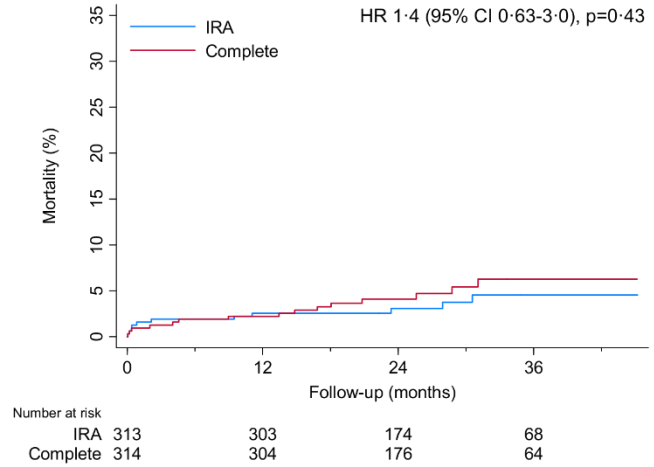
Composite



Revascularisation



Non fatal MI



All cause death

DANAMI3-PRIMULTI

	IRA only (n = 313)	Complete revascularisation (n = 314)	HR [95% CI]	p
Primary endpoint	68 (22%)	40 (13%)	0·56 [0·38 – 0·83]	0·004
All-cause death	11 (4%)	15 (5%)	1·4 [0·63 – 3·0]	0·43
Nonfatal MI	16 (5%)	15 (5%)	0·94 [0·47 – 1·9]	0·87
Ischemia-driven revascularisation*	52 (17%)	17 (5%)	0·31 [0·18 – 0·53]	<0·001
Secondary endpoints				
Cardiac death	9 (3%)	5 (2%)	0·56 [0·19 – 1·7]	0·29
Cardiac death or nonfatal MI	25 (8%)	20 (6%)	0·80 [0·45 – 1·45]	0·47
Urgent PCI	18 (6%)	7 (2%)	0·38 [0·16 – 0·92]	0·03
Non-urgent PCI	27 (9%)	8 (3%)	0·29 [0·13 – 0·63]	0·002

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* PCI or CABG

Procedural data (DANAMI3-PRIMULTI)

	IRA only (n = 313)	Complete revascularisation (n = 314)	P
Procedure duration (min)	42 (31 – 59)	76 (56 – 100)	<0·0001
Contrast volume (ml)	170 (125 – 220)	280 (215 – 365)	<0·0001
Fluoroscopy dose (Gycm^2)	49 (33 – 74)	77 (52 – 115)	<0·0001
Number of arteries treated per patient	1 (1–2)	2 (1–3)	<0·0001
Number of implanted stents	1 (1–1)	2 (1–3)	<0·0001
Stent diameter (mm)	3·5 (2·75–3·5)	3·0 (2·75–3·5)	0·005
Total stent length (mm)	18 (15–28)	33 (18–51)	<0·0001
Stent type			0·5
No stenting	18 (6%)	12 (4%)	
Bare-metal	5 (2%)	3 (1%)	
Drug-eluting	290 (93%)	298 (96%)	
Use of Glycoprotein IIb/IIIa inhibitor	72 (23%)	64 (20%)	0·4
Use of Bivalirudin	234 (75%)	237 (76%)	0·8

Multivessel Coronary Disease Diagnosed at the Time of Primary PCI for STEMI: Complete Revascularization Versus Conservative Strategy.

PRAGUE - 13 Trial

- Inclusion Criteria:
  - Patient with acute myocardial infarction with ST segment elevation (STEMI)
  - Angiographically successful primary PCI of infarct-related stenosis (TIMI flow grades II-III)
  - One or more other stenoses (≥70%) of "non-infarct" coronary artery (arteries) found by coronary angiography, (diameter of artery ≥ 2,5mm)
  - Enrollment ≥48 hours following onset of symptoms
- Exclusion Criteria:
  - Stenosis of the left main of left coronary artery ≥ 50%
  - Hemodynamically significant valvular disease
  - Patients in cardiogenic shock during STEMI
  - Hemodynamic instability
  - Angina pectoris > grade 2 CCS lasting 1 month prior to STEMI

- Three centers in Czech Republic
- 213 patients enrolled
- No difference between two arms in primary composite endpoints (or its individual elements)

	Complete Revascularization	Conservative Management	HR (95% CI)
Primary Composite Endpoint	16.0%	13.9%	1.35 (0.66-2.74)
All-Cause Mortality	5.7%	6.5%	0.91 (0.30-2.70)
Nonfatal MI	10.4%	7.4%	1.71 (0.66-4.41)
Stroke	0	2.8%	-

2014 ESC/EACTS guidelines on myocardial revascularization

Primary PCI for myocardial reperfusion in STEMI: procedural aspects (strategy and technique)

Recommendations	Class[a]	Level[b]	Ref[c]
Strategy			
Primary PCI should be limited to the culprit vessel with the exception of cardiogenic shock and persistent ischaemia after PCI of the supposed culprit lesion.	IIa	B	234,264–266
Staged revascularization of non-culprit lesions should be considered in STEMI patients with multivessel disease in case of symptoms or ischaemia within days to weeks after primary PCI.	IIa	B	235
Immediate revascularization of significant non-culprit lesions during the same procedure as primary PCI of the culprit vessel may be considered in selected patients.	IIb	B	267
In patients with continuing ischaemia and in whom PCI of the infarct-related artery cannot be performed, CABG should be considered.	IIa	C	

2015 ACC/AHA/SCAI Focused Update on Primary PCI for Patients with STEMI

Culprit Artery – Only Versus Multivessel PCI

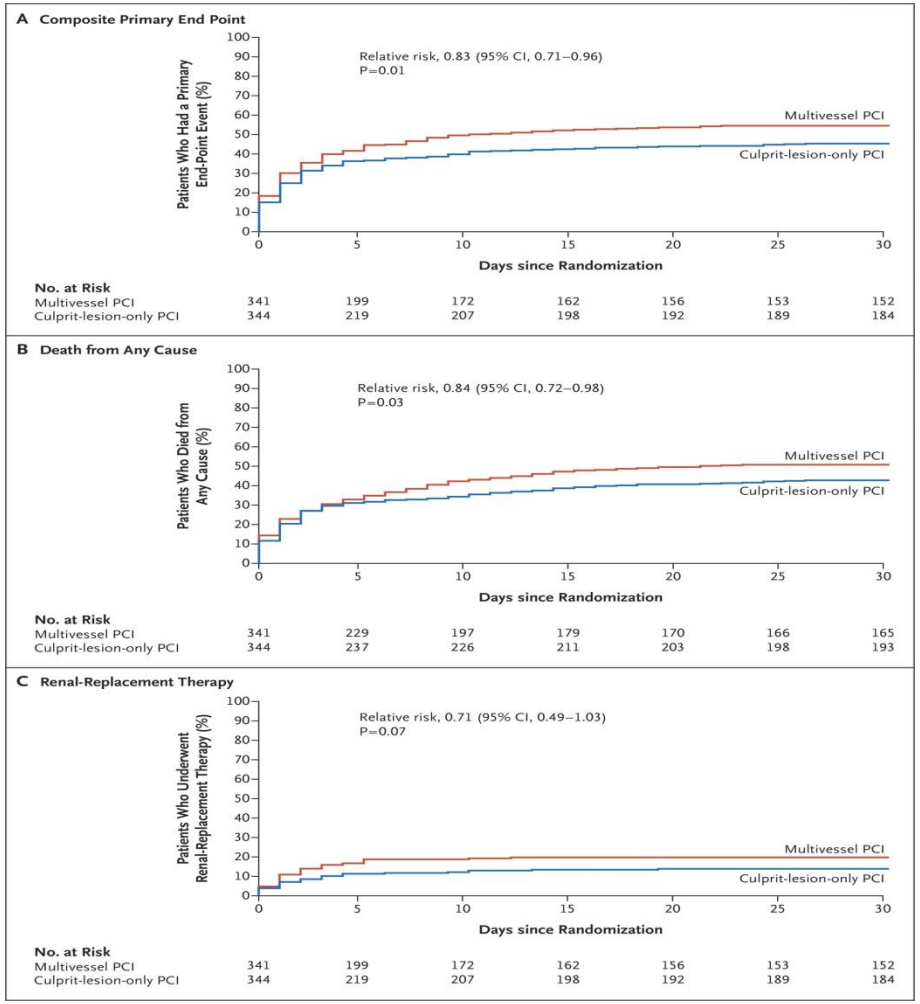
COR	LOE	Recommendation
IIb	B-R	PCI of a noninfarct artery may be considered in selected patients with STEMI and multivessel disease who are hemodynamically stable, either at the time of primary PCI or as a planned staged procedure.[1]

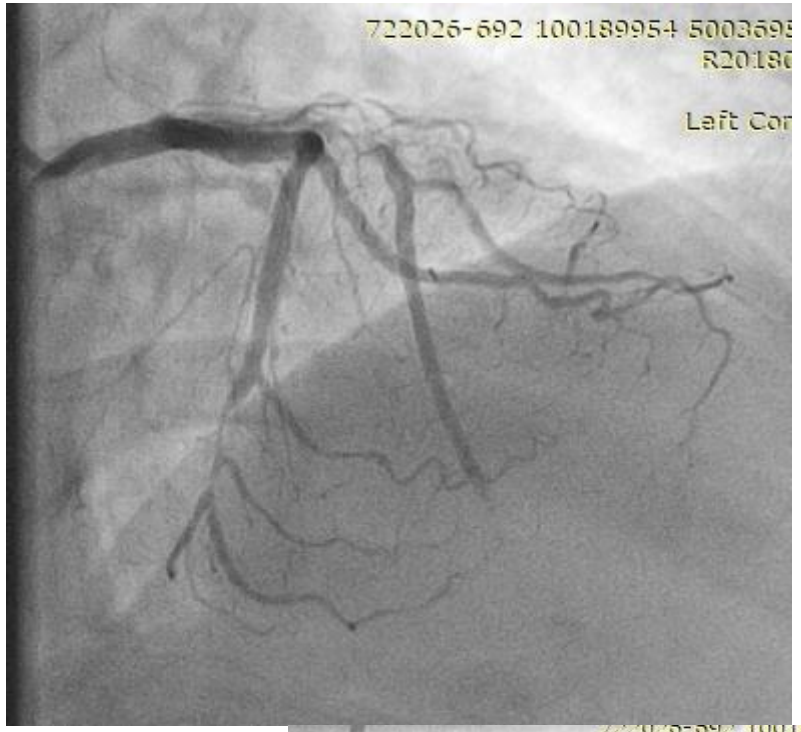
1. Modified recommendation from 2013 Guideline (changed class from III: Harm to IIb and expanded time frame in which multivessel PCI could be performed).

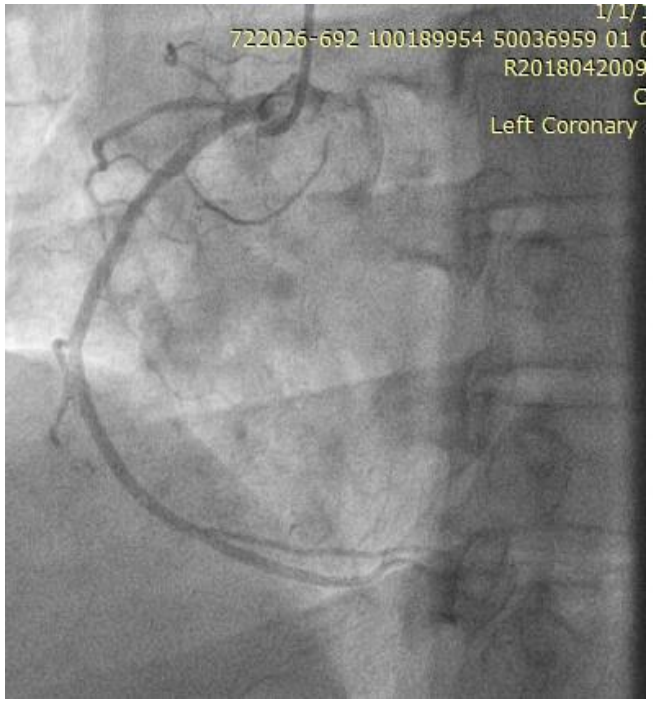
CULPRIT SHOCK trial

- Multicenter, open-label, randomized trial
- N=706 . Culprit lesion-only PCI (n=351);
- Immediate multivessel PCI (n=355)
- 83 centers in Europe
- Duration of follow-up: 30 days
- Primary Outcome: Death from any cause or severe renal failure leading to renal replacement therapy

Thiele. NEJM 2017



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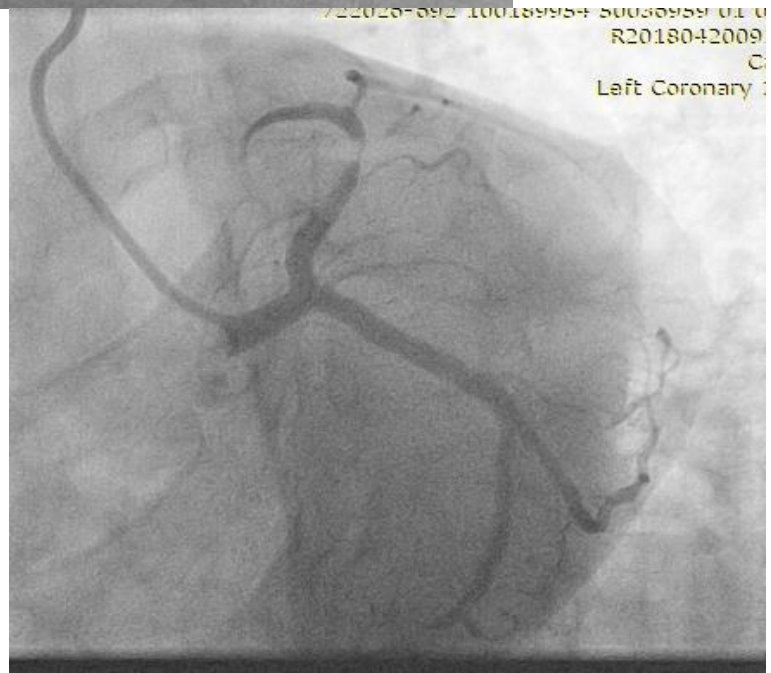
R2018042009
Left Coronary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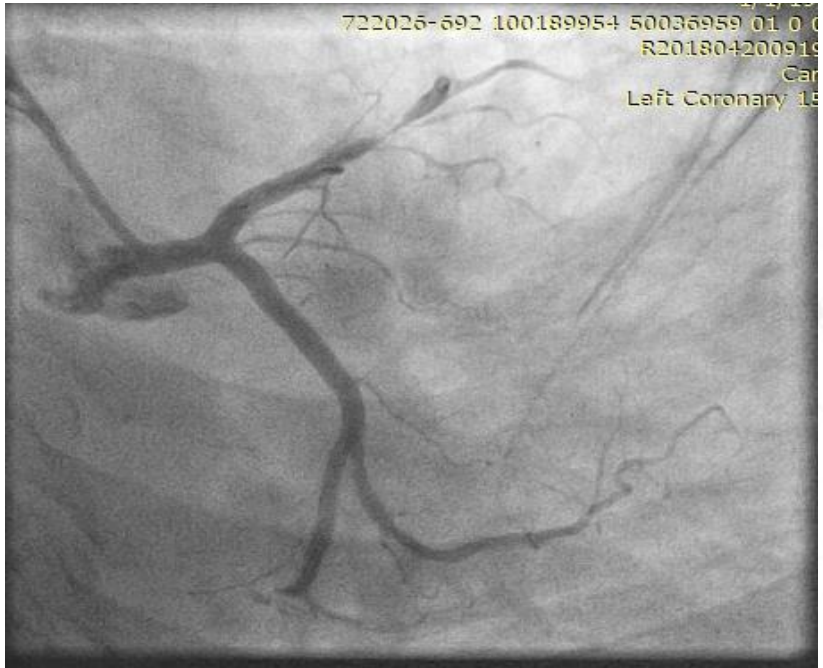
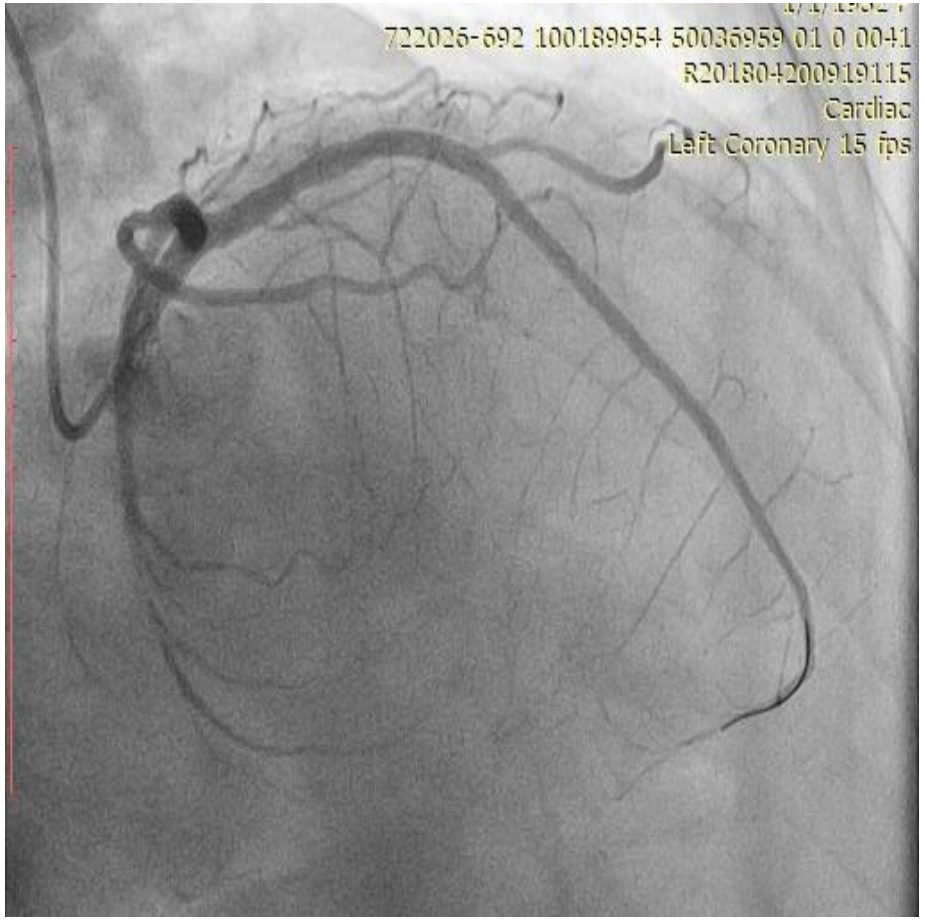
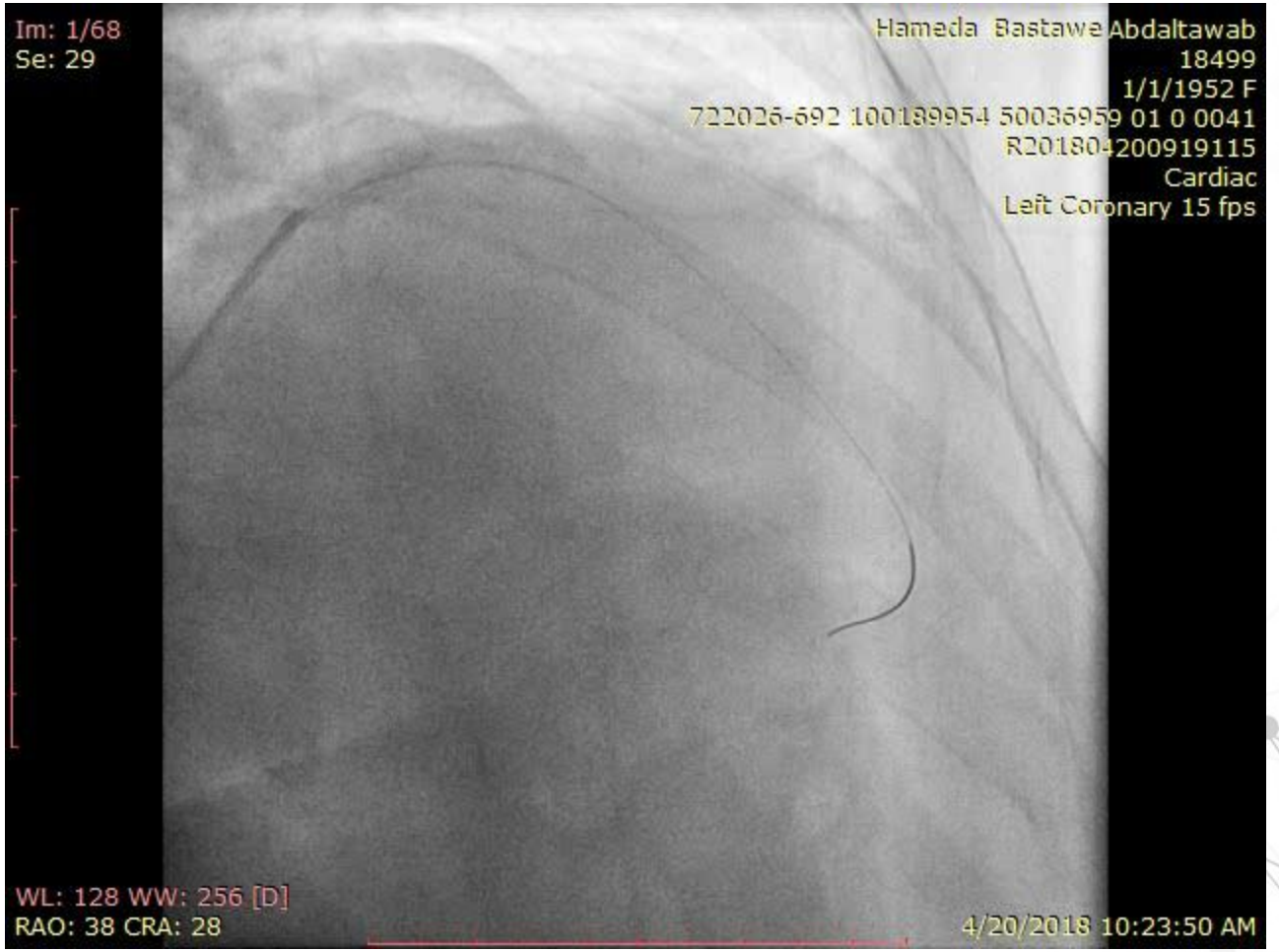
Left Coronary


722026-692 100189954 50036959 01 0
Left Coronary

Final results





What do you think is the best strategy in Africa?